Burmese Border Guidelines

2020

ABOUT THE BURMESE BORDER GUIDELINES 2020, 5TH EDITION

The Burmese Border Guidelines (BBG) 2016 has been updated to increase access to medical information for medics treating patients in moderately resourced health clinics and primary hospitals along the Thailand/ Myanmar border. The number of malaria infections has decreased, and patients now present with many other diseases and infections. This means we need increased knowledge and understanding for non-communicable diseases, chronic medical problems, psychosocial issues, infectious disease outbreaks and less common infections.

Specific SMRU guidelines are available such as the Malaria Guidelines, Neonatal Guidelines, Obstetric Guidelines. In the BBG, we refer to these other guidelines when needed.

Each chapter follows the format: EMERGENCY, CONDITIONS, DEFINITION, CAUSES, SIGNS AND SYMPTOMS, DIAGNOSIS, TREATMENT, and PREVENTION. We do not provide translation to Burmese or Karen because the information may not be clear in another language. We have tried to make the English easier to understand.

What has changed in the guidelines compared to the BBG 2016:

1. The SMRU **Paediatric Guidelines** (from version 2010) have been added.
2. **New sections** have been added. If a section is new, a superscript *new is added
3. Some sections have been **updated.** If a section has been updated a superscript *update is added.
4. The **Mae Tao Clinic (MTC) medication handbook** has been updated. The drug guide is now organised in alphabetical order. The WHO category was removed. Maximum doses have been added for some drugs (especially for paediatrics).
5. An **index** was added to make topics easier to find.

RESOURCES used for this update include: Médecins Sans Frontières (MSF) 2019 'Clinical guidelines Diagnosis and Treatment Manual'; immunisation, treatment and management guidelines from the World Health Organisation (WHO); UpToDate®; 'Guidelines for the clinical management of HIV infection in Myanmar' 2017, 5th edition (and amendment from 2018); 'Consolidated guidelines on the use of Antiretroviral drugs for treating and preventing HIV infection, recommendations for public health approach', 2nd edition, 2016 (and supplement from December 2018). Links to the webpages are provided for photos that are not open source.

CONTRIBUTORS

These guidelines have been updated by physicians and medics working at SMRU from 2016 – 2020. Mae Tao Clinic has contributed their Pharmacy handbook which was created using the 'Clinical Guidelines Diagnosis and Treatment Manual' (MSF 2013) and the 'British National Formulary' BNF (2014). We also thank all the contributors to the BBG over the last 30 years. Each version improves because the work builds on the previous work.

Contributors to the original BBG 2007	Contributors to the BBG 2016 update
• Aide Medicale Internationale (AMI) • American Refugee Committee (ARC) • International Rescue Committee (IRC) • Malteser International (MI) • Médecins Sans Frontières – France (MSF) • Mae Tao Clinic (MTC) • Shoklo Malaria Research Unit (SMRU) • Thailand Burma Border Consortium (TBBC) • United Nations High Commissioner for Refugees (UNHCR)	• Physicians and volunteers working at SMRU from 2012-2016 • Mae Tao Clinic (MTC) contributed their medication hand book and information from the chronic care guidelines • In memory of Dr. Frank Green (MTC) - eye disease • Dr. Rangsun Sitthichai – mental health • Maria Bovill (TBC) - nutrition

FINANCIAL ASSISTANCE

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HOW TO USE THE GUIDELINES

These guidelines do not replace clinical decision-making. It can help to increase understanding and knowledge of a disease so you can develop or confirm a diagnosis. These guidelines were adapted from medical reference books and are for basic situations for use in clinics and hospitals on the Thailand/ Myanmar border. These guidelines may not be appropriate for use in other settings (i.e. tertiary hospital or field site).

The **treatment options** help you to choose a therapy according to the severity of the disease and the age of the patient. **Treatment schedules** mentioned in this book are just one way to cure a patient; keep in mind that other therapies (suggested by other guidelines or new health workers) could be used to treat your patient.

- Read the **TEXT** for information about the disease. This tells you which signs and symptoms you should expect, which tests you can use to make a diagnosis, which complications or signs of severity to look for, which treatment to use and how to prevent the disease.

- Read the **TABLES** for the medicine that you have chosen in order to find the correct dose according to the age or weight of the patient. Here you will find contra-indications and warnings for use of medicines.

mg	=	Milligram
g	=	Gram
kg	=	Kilogram
ml	=	Millilitre
cc	=	Cubic centimetre
d	=	Day
mn	=	Minute
X	=	Times
/	=	Per
Tab	=	Tablet

PO	=	per os (oral)
IM	=	intramuscular
IV	=	intravenous
PR	=	per rectum
PV	=	per vagina
SC	=	subcutaneous
STAT	=	single dose
OD	=	one time a day
BID	=	2 times a day/ 12 hourly
TID	=	3 times a day/ 8 hourly
QID	=	4 times a day/ 6 hourly

Note: 1cc = 1ml
Example: **'2 tabs TID x 5d'** means '2 tablets taken 8 hourly over a period of 5 days'

AFB	=	Acid Fast Bacilli
AIDS	=	Acquired Immune Deficiency Syndrome
ANC	=	Ante Natal Care
ARI	=	Acute Respiratory Infection
BP	=	Blood Pressure
CRP	=	C - Reactive Protein
D5W	=	Dextrose 5% and Saline/Water
ESR	=	Erythrocyte Sedimentation Rate
Hb	=	Haemoglobin
Hct	=	Haematocrit
HIV	=	Human Immuno-deficiency Virus
IPD	=	In-Patient Department
LRTI	=	Lower Respiratory Tract Infection
MS	=	Malaria Smear
NSS	=	Normal Saline Solution

PFG	=	Plasmodium Falciparum Gametocytes
PFT	=	Plasmodium Falciparum Trophozoites
PR	=	Pulse Rate
PVG	=	Plasmodium Vivax Gametocytes
PVT	=	Plasmodium Vivax Trophozoites
R/L	=	Ringers Lactate
RR	=	Respiratory Rate
SFP	=	Supplementary Feeding Program
TB	=	Tuberculosis
TFP	=	Therapeutic Feeding Program
URTI	=	Upper Respiratory Tract Infection
UTI	=	Urinary Tract Infection

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1.1 GENERAL APPROACH TO PATIENTS

Kindness and respect are very important to successful care.
****Treat patients the way you, or your family would like to be treated****

When you receive the patient in the consultation room, take the following steps:

- **Greet** the patient. Make the patient **comfortable**: invite the patient to sit down or lie down if they are very sick.

Give the patient **privacy**:

- Make sure nobody else can overhear or see the patient during the examination.
- If possible, there should be only one patient at the same time in the consultation room.
- One medic should carry out the consultation in a private room/ area.
- Take special (privacy) care when doing a gynaecological or genital examination.

Check for DANGER SIGNS (*see Figure 1.2, p.3*). If the patient shows any danger signs then assess using DRS AB-CABDE/S *(see p.13)* and provide urgent and immediate treatment, consult the doctor and admit to IPD or refer to hospital.

Take a **history** and look at their record book (lemma):

- Ask about symptoms
- Medical history (illness, treatment (important for antibiotics), menstruation and pregnancies)
- Medication history – do they take medications including traditional medicine
- Family history – if has cough and suspect TB ask if anyone in the family has been coughing
- Smoking/alcohol – at same time advise them to stop/take less

Examine the patient thoroughly including vital signs (BP, PR, RR, temperature, SpO2) and weight.

Do any **investigations** (e.g. CBC, malaria screen, biochemistry etc).

Make a **differential** diagnosis and list the most likely as the first diagnosis and the least likely as the last.

Classify if patient needs: Referral to Hospital (**DRS-AB-CABDE/S first,** *see p.13*), IPD admission (emergency room or IPD), or OPD treatment. **Note**: If the patient needs **urgent referral**, stabilise the patient before the patient is sent.

Discuss with the doctor if the patient is unwell, condition and treatment are complicated, or if you are uncertain.

Give appropriate **treatment**.

Counsel the patient (or the family) about the problem and the treatment. If you do not know the diagnosis, tell the patient you do not know (be honest), then explain what can be done to find out.

If the patient needs admission, but they **need to go home**, counsel them to stay e.g. 'because you need strong antibiotics into the vein.' If they cannot be admitted, give oral treatment if possible. Explain the danger signs (*see Figure 1.2*) and return to the clinic immediately if they have any. Document the counselling in the lemma and that they have left the clinic against medical advice.

Give **preventative** (*see below*) or screening care e.g. for children < 5 years old, check their immunisation status and for signs of malnutrition or anaemia.

If the patient is to receive **OPD medical treatment** and advice:

- Give them practical instructions on how to take the treatment at home (if they understand well they will be able to explain to you how they will take their medication).
- Give the first dose of oral drugs in the clinic if there is treatment given.

- Ask the patient to wait for one hour before leaving the clinic to make sure the patient does not vomit the treatment.
- Give advice on foods and fluids during illness, and hygiene (wash hands).
- Consider whether supervised treatment is needed.

Give **follow-up care** (*see below*). Ask the patient to return for a follow-up OPD visit, if needed, and give a specific date. Give counseling on **danger signs** (for the specific disease). If the patient develops danger signs, return to the clinic immediately.

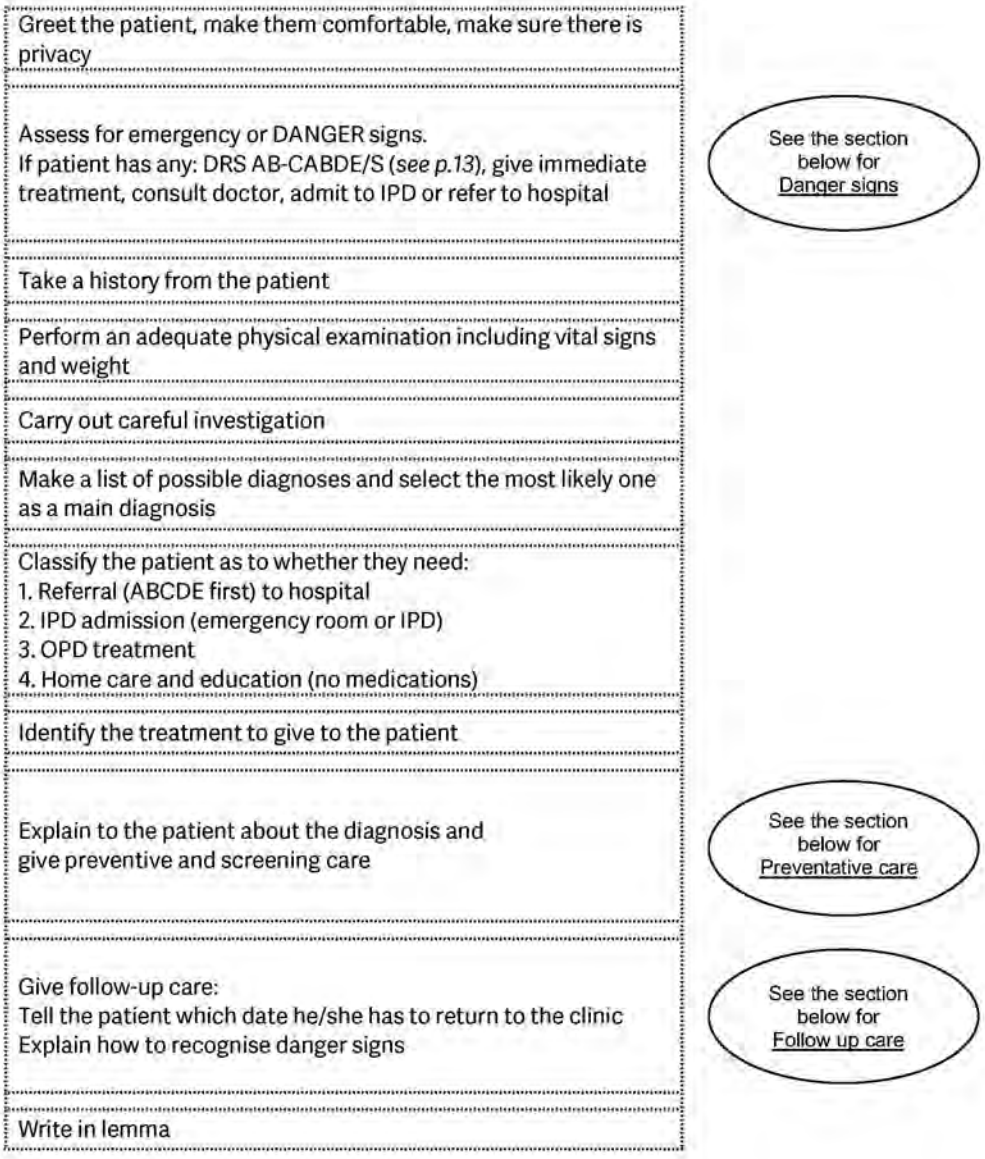
- e.g. if you diagnose a child with common cold or bronchitis, give follow-up care health education to the family. Tell the parents to return to the clinic immediately if the child develops difficulty breathing or fast breathing.

Write down briefly the patient's complaints, examination (including vital signs/weight), and laboratory findings in the lemma. Then write down clearly the diagnosis and the treatment in the lemma. Write if any preventative care/screening given.

When the patient comes back for the OPD follow-up visit, ask if your treatment has been effective and ask if the patient feels better. Continue or change treatment if necessary. Assess the patient for any new problems.

The following sections on the next pages give an overview and example for adults of what 'danger signs', 'preventative care' and 'follow-up care' mean.

Figure 1.1 Summary steps to providing patient care



1.2 DANGER SIGNS

Airway: stridor is a sign that the airway is obstructed
Breathing: cyanosis (blue lips), severe respiratory distress
Circulation: weak and fast or slow pulse, low BP or capillary refill >2secs
Disability: confusion, unconscious, convulsions
Specific symptoms

1. **Fever, stiff neck, photophobia = meningitis**
2. **Severe abdominal pain, hard abdomen = peritonitis**
3. **Face droop, speech problem, one sided weakness = stroke**
4. **Chest pain (central (radiation to left arm or jaw), severe, 'crushing', sweating) = heart attack**
5. **Major trauma**
6. **Psychiatric aggression**

1.3 PREVENTATIVE CARE

Some examples of preventative and screening care:

General

- Provide advice to all (malaria) patients on malarial transmission, and how infectious bites can be prevented.
- Advise patients (especially with heart disease, HBP or DM) on lifestyle changes (*see p.44*).
- Advise patients (especially with reproductive tract infections) on sexually transmitted diseases, offer family planning and offer referral to VCT testing.
- Advise patients on the hazards of smoking, chewing betel nut, drinking alcohol or using drugs.
- Screen all adult patients for hypertension and diabetes

For pregnant women

- Check tetanus immunisation status.
- Check for signs of anaemia and provide prophylactic doses of anaemia treatment (*see p.135 and Obestetric Guidelines*).

For children

- Ask about developmental milestones
- Check immunisation status (*see Appendix 2*)
- Check height (or length) and weight. Plot on the growth chart (correct chart for age and sex)

1.4 FOLLOW UP CARE

Treating the patient depends on proper diagnosis and a good choice of treatment.

- In IPD you can supervise the treatment.
- In OPD you cannot be sure that the patient completes the full course of treatment.

TO ENSURE PROPER USE OF MEDICINES BY THE PATIENTS, REMEMBER THESE RULES:

1. **Do not prescribe more than 2-3 medicines (unless there is a special reason to do so)**
   - It could be dangerous (some medicines taken together may become toxic).
   - It could be useless (some medicines taken together stop working).
   - It may be difficult for the patients to remember the dose, the time and the number of days they have to take each medicine.

2. **For acute diseases/infections give the full course of medicines**
   - Instruct the patient to take the complete course (confirm that the patient understands) and return if no improvement, or if there is any **DANGER SIGN**.

3. **For chronic diseases, supply medicine based on the frequency you see the patient**
   - For most chronic illnesses you should see the patient at least every three months.
   - Limit medicine supply to 3 months at one time and ensure the patient knows to return before they run out.
   - If the patient is not routinely taking their chronic medication this could be causing more harm than good to the patient so stop prescribing the medication unless you are sure that the patient will take it regularly.

4. **Prepare the medicine**
   - Cut tablets for children.
   - Write the name of the medicine and dosage on the pill bag.

5. **Advise the patient on their prescription (and ask them to repeat back what you explained)**
   - When to take the medicines (6 hourly, 8 hourly, 12 hourly).
   - How many tablets to take.
   - How many days.
   - How to use local treatments, prepare ORS etc.
   - When to return to the clinic.

PRINCIPLES OF UNIVERSAL PRECAUTIONS

DEFINITION
Universal precautions are simple measures taken to prevent transmission of infection of bacteria and viruses from body fluids from:

- Patient to health care worker
- Patient to patient
- Health care worker to patient

Universal precautions are important because we use them for **ALL** patients and health care workers. All body fluid should be considered infectious, since it is not known who is infected and who is not. A health worker and lab technician are at risk of needle prick injuries and splashes of body fluids into the eyes, mouth etc. A patient is at risk if the health care worker is infected. These areas can be protected some ways (*see section 2.2*), but awareness and avoidance of the potential risks are the best way of preventing infection.

SUMMARY OF MANAGEMENT

- Hands are the main source of infections in the clinic. Wash hands with water and soap every time:
    1. Before and after patient contact
    2. Before aseptic tasks (e.g. blood culture or IV placement)
    3. Before and after removing gloves
    4. After clinic duties
- No jewellery
- Cover all cuts
- Wear gloves if there is a risk of contact with blood and body fluids
- If there is a risk of splashing of blood or body fluids you can protect yourself further by wearing eyeglasses/goggles/face shield, mask and/or gown (e.g. during incision and drainage or labour and delivery)
- Use a safe system for health-care waste management and disposal
- Put patients in another area if their body fluids may contaminate surfaces or other patients (e.g. diarrhoea)
- Clean up spills of body fluids immediately – use bleach / chlorine / virkon or ask safety officer health care workers and clinic staff should check and update their vaccines
- Do not perform unnecessary procedures. For example, avoid unnecessary blood transfusions, injections, or suturing

2.1 HANDWASHING

Make sure there is running water or access to water in the clinic.
Wash your hands with plenty of water and soap. If there is visible dirt on the hands, hand wash with soap and water and do not only use alcohol. If alcohol is used after handwashing, alcohol concentration of ≥60% needed.

- Wash hands immediately after contact with blood, body fluids, mucous membranes or broken skin, even if you were wearing gloves.
- Wash hands before and after eating or preparing food
- Wash hands after using the toilet
- Wash hands after blowing your nose, coughing or sneezing into your hands
- Wash hands before giving injections or drawing blood
- Wash hands after each patient contact (at least wash hands with alcohol gel)
- Wash hands after handling dirty items
- Wash hands before start shift of patient care and after leaving shift of patient care

2.2 PROTECTIVE CLOTHING AND EQUIPMENT

Personal protective equipment (PPE) in health care specifically describes special clothing or equipment used to protect against infectious materials.

GLOVES

- Wear clean non-sterile gloves when there is contact with blood, body fluids, mucous membranes, or broken skin.
- Change gloves between tasks or procedures on the same patient.
- Before going to another patient, remove gloves promptly and wash hands immediately.
- Change or remove gloves after handling body fluid collection (e.g. sputum, urine, blood).

GOWNS

- Use gowns when there is a risk of splashes of blood or other fluids e.g. vaginal deliveries, surgical procedures. Throw away or wash them after use.
- Wash work clothes after use.
- When the risk for infection is very high, waterproof gowns or a protective suit are used as part of PPE.

From: *https://www.covid19roundtable.com/project/4*

EYE-COVER AND MASKS

- Eyeglasses/goggles/face shield AND a mask should be used when there is a risk of splashes of body fluids, for example, vaginal deliveries or surgical procedures.
- For respiratory protection during aerosol generating procedures (e.g. NPS or sputum sample, collection, giving nebuliser) N95 masks can be used when there is a high risk of infection.

SHOE COVERINGS

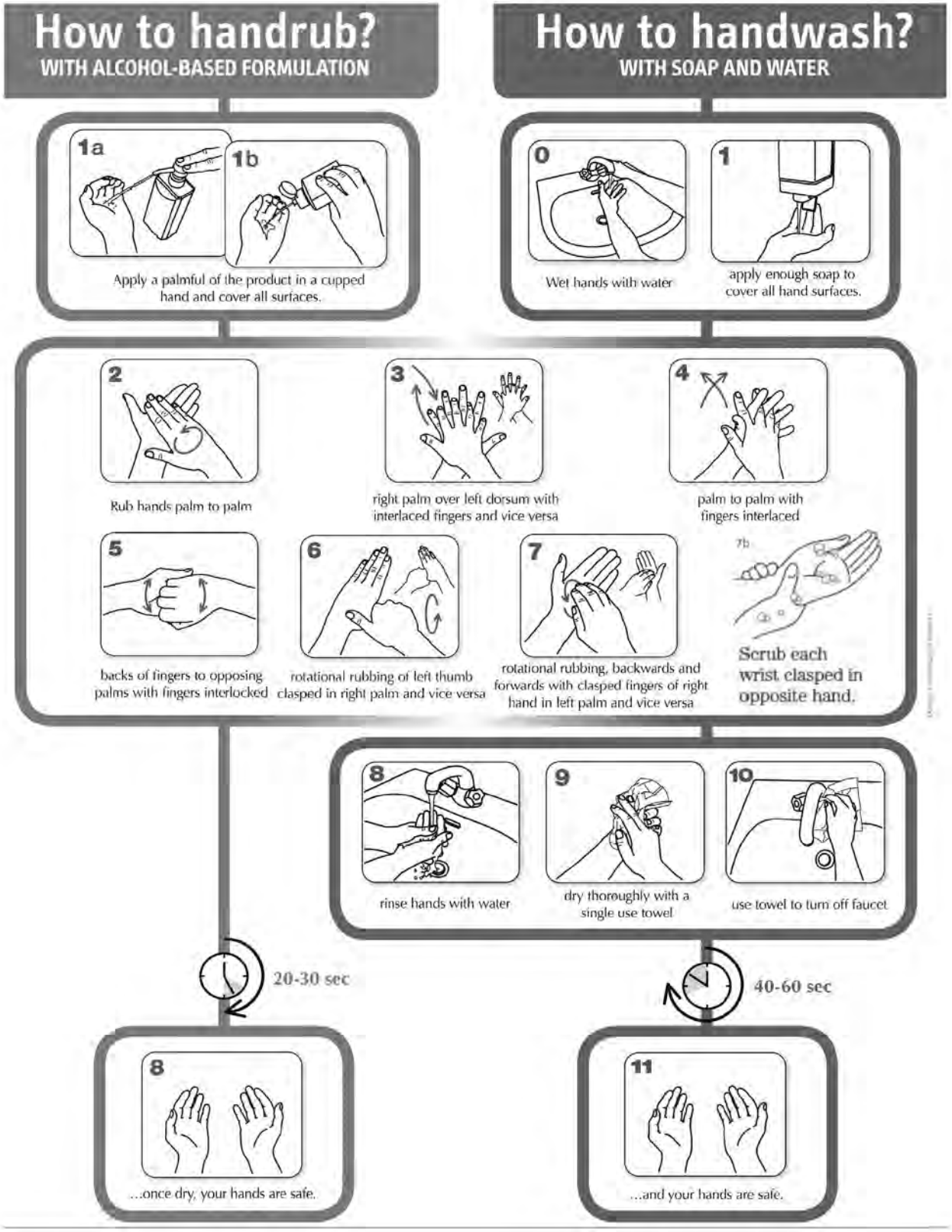
- Waterproof boots or shoe coverings should be used when there is a risk for exposure to body fluids on the floor (e.g. vaginal deliveries, surgical procedures).
- Boots or shoe coverings are also used as part of PPE when risk of infection is high.

Figure 2.1 Indications for gloves

Gloves not indicated	Non-sterile gloves	Sterile gloves
Performing subcutaneous and intramuscular injections	Speculum examination and taking vaginal swab	Insertion of urinary catheter (in-out and/or Foley catheter)
	Vaginal examination (Before artificial water bag disruption/ fluid leakage)	Any procedure of sterile area (e.g. lumbar puncture, suprapubic tap, collecting abdominal or pleural fluid)
	For finger sticks, blood draws, and IV-lines	
	Touching body fluids (blood, urine, stool, sputum, vomit)	
	Incision and drainage of an abscess.	
	Dressing a wound or burn	
	Preparing chlorine solution; cleaning items with chlorine	
	Disinfecting, cleaning or washing in the clinic	

For more information on infection control please *refer to the SMRU infection control manual*

Figure 2.2 Handwash with water and hand-rub with alcohol



2.3 ISOLATION

For airborne or droplet transmission:

- Place the patient in a separate room away from other patients. The room should be well ventilated. The doors should be closed to the hall and the windows open to the outside. This will reduce the chance of airborne infection. If possible, patients' rooms should have large windows to let in good sunlight
- Wear a mask when working with the patient
- Limit movement of the patient from the room to other areas

For contact transmission:

- Place the patient in an isolation room and limit access
- Wear gloves during contact with patient and with infectious body fluids or contaminated items. Wash hands after each patient contact
- Wear two layers of protective clothing
- Limit movement of the patient from the isolation room to other areas
- Use separate equipment for the patient, if possible. If sharing equipment is not possible, clean and disinfect it before using it with the next patient

2.4 SHARPS

- Never re-use needles. Avoid recapping needles using both hands
- Discard contaminated disposable sharps immediately into a sharps container (puncture resistant and liquid proof containers)
- The location of sharps containers is important. They should be kept as close as possible to where the sharp item is to be used
- Make sure contaminated equipment is not reused until it has been cleaned, disinfected, and sterilised properly
- When washing sharp instruments wear heavy gloves and handle with care to avoid injury

2.5 CLEANING ROUTINE

- Routinely clean and disinfect frequently touched surfaces including beds, bed rails, patient examination tables and bedside tables. Always use gloves when cleaning. Clean the area with disinfectant e.g. bleach, alcohol or virkon
- Clean and disinfect soiled linens and launder them safely. Avoid direct contact with items soiled with blood and body fluids
- Cleaning routine should be done daily. When there are outbreaks, cleaning routine may be done BID or more

2.6 LAB STAFF

- Assume all specimens are contaminated and use universal precaution for all samples
- Wear gloves
- Wear eye protection if there is a risk of splashes
- When cleaning lab equipment wear gloves
- Do not eat or drink in the lab
- Wear a mask if dealing with airborne pathogens, such as TB

In case of exposure of a health worker to infected body materials, *refer immediately to Chapter 3* on post- exposure prophylaxis

For more details on isolation, sterilisation, disinfection, and cleaning, *refer to the SMRU Infection Control Guidelines*

3.1 GENERAL INFORMATION

DEFINITION

Post Exposure Prophylaxis (PEP) means that after somebody is exposed to body materials that might contain HIV or hepatitis virus, he or she can take prophylactic medicine to try to prevent HIV infection or vaccination to prevent hepatitis B disease. Unfortunately, there is no PEP available for hepatitis C.

Source person e.g. the patient = the person that is the possible source of contamination through potentially infectious blood or body fluids.

Exposed person e.g. the health care worker with needle stick = the person who may be at risk of infection with HIV/hepatitis B or C from contamination with potentially infectious blood or body fluids.

GENERAL TREATMENT

For all exposure to potentially contaminated fluid do immediate first aid and follow the steps below:

1. **Immediate first aid**
   - When there is a wound (e.g. needle prick), do not stop the bleeding, do not squeeze but immediately wash thoroughly with soap and water, and then rinse.
   - If skin is exposed but there is no wound, wash with soap and water, then rinse
   - When eyes or mouth are exposed (e.g. blood/fluid splash), wash with a lot of water or NSS

For sexual violence, *see p.94 Management of rape in Gender Based Violence*

2. **Contact the person in-charge of PEP and complete a needle stick/splash injury reporting form**

3. **Risk assessment**
   - Together with the PEP focal or other experienced person, follow the steps below and make an assessment of the risk of infection and if PEP is needed.
   - Some exposures have more risk of HIV and hepatitis B or C than others. The level of risk will determine the management. Refer to the PEP Guidelines for further information on risk assessment of exposures.

4. **Ask if the exposed person has been fully vaccinated against hepatitis B.**

5. **Obtain consent from the source person before testing them**
   - Explain to the patient why it is important to test them. Give pre-test counselling. Test the blood ONLY after getting their consent. Confidentiality must be maintained
   - If the patient has already left the clinic, try to contact the patient for the blood test.

6. **Pre-test counselling for the exposed person**
   - During a confidential meeting with the exposed person explain that follow up and testing will be planned (see p.146). The following points should be discussed:

     For HIV:
     - The risk of transmission of HIV after accidental exposure to blood is ~0.3% (3 in 1000)
     - The risk is similar in unprotected sex with a HIV positive partner
     - PEP is not 100% effective in preventing HIV infection; it will reduce the risk of acquiring HIV from the exposure but does not eliminate the risk completely
     - The side effects of PEP are usually minor but require monitoring

     For Hepatitis B:
     - The risk of transmission of hepatitis B depends on stage of infection of the source person

     For Hepatitis C:
     - The risk of transmission after exposure to hepatitis C positive blood is approximately 1.8%

7. **If possible and the source person consents do:**
   - Rapid HIV test (if positive send sample to an outside laboratory for confirmation)
   - Rapid HBsAg test for hepatitis B (if positive, send sample to an outside laboratory for confirmation
   - Hepatitis C test – send sample to an outside laboratory
   - Pre and post-test counselling must be done

8. **Take a serum from the exposed person and save** (blood sample will be tested later if needed).
   - It is important to do a blood test before you start PEP. You can only test this blood if you have given pre-test counselling and received consent from the exposed person. This takes a lot of time and is too long to wait before giving PEP. PEP is more effective if given quickly after the event.
   - After starting PEP, counselling and getting consent test the serum save blood test (*see below*)

9. **If required give specific PEP treatment** (*see p.10*)
   - Ideally within 2 hours
   - The HIV/hepatitis test is voluntary. PEP should never be withheld because a serum save test has not been done. If the exposed person does not want to have a HIV/HBsAg test PEP can still be given.

10. **If the exposed person consents test the serum save for HIV and HBsAg.**
    - It is important to check the baseline result before PEP. You can wait for a few days for a decision.
    - If positive send for confirmation.

11. **Follow up** (*see p.12*)

3.2 POST EXPOSURE PROPHYLAXIS TREATMENT

3.2.1. PEP FOR HIV*UPDATE

DEFINITION

Post exposure prophylaxis (PEP) for human immunodeficiency virus (HIV) is a 28-days course of antiretroviral therapy (ART) that reduces the likelihood of HIV transmission after exposure to a possible HIV positive person. PEP is an essential precaution in the clinical management of rape and for occupational exposures to potentially HIV infected body fluids. The availability of PEP is not a replacement for effective universal precautions, a continuous supply of protective materials (gloves, sharp boxes) and safe disposal of dangerous materials.

What body materials from a person with HIV can contain the virus?
- Blood
- Sperm, vaginal fluids
- Amniotic fluid (important for midwifes)
- Ascites, pleural fluids, pus

HIV is NOT found in:
- Sweat
- Saliva
- Vomit/stool
- Urine

What kind of contact with these infected fluids can cause HIV transmission?
- Needle prick accidents. (Pricking yourself after you pricked the patient or pricking yourself on a used needle e.g. whilst emptying the needle container).
- A splash of fluid into the eyes or mouth.
- Blood or body fluids contaminated on a large area of skin, or a small area of skin with wounds.
- Rape or sexual violence.
- Unprotected sex with a known HIV positive person (e.g. condom rupture if one of the partners is HIV infected).

** **Note**: HIV is not transmitted by talking, touching, kissing, or using the same toilet **

TREATMENT
Considering the nature of exposure, and the probable HIV status of the source. **Contact the safety officer** about starting PEP.

When in doubt, start PEP. You can always stop if it is not necessary.
The best time to start is **within 2 hours**, but PEP can be started up to 72 hours after exposure.
****The earlier PEP is started, the more effective it will be****

In cases where it is decided not to start PEP, it is important to offer clinical and psychological follow-up for the exposed person.

WHO PEP treatment guidelines (*see https://www.who.int/hiv/pub/arv/arv-2016/en/*)
PEP treatment is a combination therapy of ART given for 4 weeks. The number and type of medications will be decided on the basis of drugs taken previously by the source (if known), and known or possible cross resistance to different drugs. It may also be determined by the seriousness of exposure. It is important to give a full 28 days of PEP treatment. In the clinics a PEP starter kit is available. **Discuss with the safety officer for management.**

- HIV PEP drugs should be offered and started as soon as possible and best if **<72 hours from exposure**
- A 2-drug PEP regimen is effective, but 3 drugs are preferred (conditional recommendation)
- Treat for 28-days. Give counselling to finish the treatment course even if there are no symptoms.
- Do not use nevirapine (NVP) if >2 years old

Drug Name	Abbreviation	Drug Name	Abbreviation
Abacavir	ABC	Lamivudine	3TC
Atazanavir	ATV	Nevirapine	NVP
Ritonavir boosted Atazanavir	ATV/r	Raltegravir	RAL
Darunavir	DRV	Ritonavir boosted Lopinavir	LPV/r
Efavirenz	EFV	Tenofovir	TDF
Emtricitabine	FTC	Zidovudine	AZT

	Use 3 drugs for treatment:	
Adults and adolescents	1. TDF	**Strong recommendation, low- quality evidence for 1+2**
	2. 3TC (alternative: FTC)	
	3. LPV/r or ATV/r (if available use RAL, DRV/r or EFV)	Conditional recommendation, very low-quality evidence
Children ≤10 years old	1. AZT (alternative: ABC or TDF)	**Strong recommendation, low- quality evidence for 1+2**
	2. 3TC (alternative: FTC only if combined with TDF)	
	3. LPV/r (alternatives: ATV/r, RAL, DRV, EFV, and NVP. The choice of alternative depends on age).	Conditional recommendation, very low-quality evidence

Side Effects: Nausea, diarrhoea, muscle pain and headache. These symptoms will only last for a few days. Explain this to the patient, to prevent the patient from stopping PEP treatment. Anaemia, low white blood cells (leucopenia) and low platelets (thrombocytopenia) can also occur after day 10 and would require laboratory follow-up.

3.2.2. PEP FOR HEPATITIS

DEFINITION
Exposure to blood and body fluids also carries a risk for hepatitis B and hepatitis C infection. Hepatitis virus causes inflammation of the liver. Hepatitis B vaccine should be given if the person has not been previously vaccinated. Currently there is no vaccine available for hepatitis C.

TREATMENT
Hepatitis B vaccination:

- If the person's last hepatitis B vaccination was more than 10 years ago a hepatitis B booster vaccination is recommended.
- If the person is not vaccinated against hepatitis B, then hepatitis B vaccine should be given at the time of exposure, then at 1 month and 6 months after the exposure.

3.3 FOLLOW UP FOR ALL EXPOSED PERSONS

- Providing psychological support is important at this time, as not knowing whether you have become infected with HIV or hepatitis can be very distressing.
- In the weeks following the accident the person should be monitored for signs indicating HIV infection: acute fever, lymphadenopathy, cutaneous eruption (skin rash), sore throat, flu-like symptoms and mouth ulcers. These appear in 50-70% of individuals with primary infection, usually within 3-6 weeks after exposure. Advise the exposed person that if they have any of these symptoms they must come to the clinic.
- Until the result of the last HIV test at 6 months is known, the exposed person should not have unprotected sex, and should not donate any blood.
- HIV follow up testing is required:
    - 3 months after exposure
    - If negative, 6 months after exposure
- If the HIV test after 6 months is still negative, then it is sure that there has been no HIV transmission

4.1 CPR FOR ADULTS*UPDATE

Figure 4.1 Cardiopulmonary resuscitation (CPR) chart - based on Emergency First Response 2015 guidelines*update

Assess the scene for danger to patient and yourself (e.g. near the road, fire, etc)

↓

Open Airway (Head tilt, chin lift)
Assess for Breathing (look, listen, feel)

↓

Call for help
(if drowning, take care of patient BEFORE call for help if it is safe to do so)

↓ No breathing

Start Chest compressions (ratio 30 compressions : 2 breaths)

↓ Get **AED**

Insert IV Line

↓

Give Adrenaline STAT
Give 1 vial (1ml=1mg) of 1:1,000 and flush with 10ml NSS
Give fluid bolus 500ml NSS (If shock due to diarrhoea give Ringer Lactate)
Check Dextrose: if less than 45mg/dL give dextrose bolus

↓

During resuscitation look for Serious bleeding, Shock, Spinal injury and causes of cardiac arrest
Assess for 4 Hs and 4 Ts

4 Hs	**4 Ts**
Hypoxia	**Toxin**
Hypothermia	**Tamponade**
Hypovolaemia	**Thrombus (PE, MI)**
Hypo/hyperkalaemia	**Tension pneumothorax**

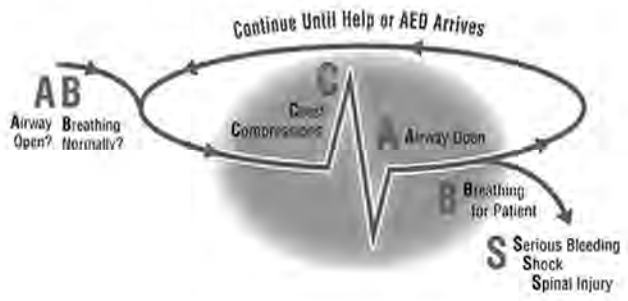
↓

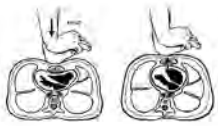
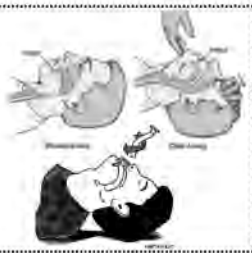
Reassess every 2 minutes (CABDE/S), look, listen, feel (within <10sec)
If no signs of life: continue CPR.
Repeat adrenaline every 2 cycles of CPR (3-5 minutes) if still no signs of life

↓

If no signs of life after 20 minutes STOP after discussion with the arrest team

Cycle of Care: AB-CABS™



CHEST COMPRESSION	Middle of the chest, depth 5-6cm, rate 100-120/minute, when giving breaths STOP chest compressions. Chest compressions are the most important part of resuscitation so ensure they are of good quality and minimise interruptions. It is very tiring to give good chest compressions so rotate this task regularly.	
AIRWAY	**Head Tilt and Chin Lift** – place hand on forehead and tilt head back (head tilt) and place fingers below chin and pull up (chin lift). **Oropharyngeal airway** (also known as guedel airway) can be used if you think the airway is obstructed. To use insert with the tip towards the top of the head and once you hit the back of the throat then turn upside down.	
BREATH	Use a **bag, valve mask** attached to high flow **oxygen**. Make sure there is a tight seal around the mask and face. When giving breaths allow bag to fill up completely before doing next breath, watch that the lungs are expanding when breaths are given.	

4.2 GENERAL APPROACH TO EMERGENCY

IF UNCONSCIOUS, DO AIRWAY MANEOUVRES, QUICK 10 SECOND ASSESSMENT FOR **AIRWAY AND **BREATHING**. IF NO BREATHING. **CALL** FOR HELP and START **CPR****

Figure 4.2 DRS ABCDE chart

	ASSESS FOR	**TREAT**
DRS	Danger Response – does patient respond? Send for help	Gloves for you Safe place for patient Call for help
Airway	Any airway obstruction Speaking Stridor Secretions Swelling	Simple airway manoeuvres Suction if available Oral/nasal airway
Breathing	Respiratory rate Oxygen saturations (SpO2) Pattern of breathing Cyanosis Accessory muscle use/tracheal tug/chest in-drawing Listen to chest	Position patient sitting up if breathing problem Oxygen 15L reservoir mask Consider nebulisers Consider furosemide
Circulation	Pulse rate Blood pressure Capillary refill time Urine output Temperature	IV line Blood tests Fluid bolus Consider transfusion ECG
Drugs/Dextrose	Check dextrose Seizures Pain	Consider antibiotics Correct blood sugar Control seizures Control pain
Everything Else	Conscious level (AVPU/GCS) All over body examination Neuro - neck stiffness, pupils, limb tone, power, reflexes, facial droop Abdomen Skin - Rash Wounds	Consider left lateral position Review notes and charts Get more history Make management plan Consider what investigations need to be done
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

Figure 4.3 Emergency fluid chart

Fluid Bolus with NSS: (if shock due to diarrhoea use Ringer's Lactate)
Adult: 500ml IV
Child: 10ml/kg IV
Re-check vital signs before repeating

Figure 4.4 Emergency drug chart

CPR
Adrenaline IV: 1 in 1,000 (1mg/ml)
- Adult: give **1ml** and **flush with 10ml NSS**
- Child and infant: use 0.5ml insulin syringe. Draw up **0.01ml/kg. Add NSS** to fill the syringe. Give dose and **flush with 3ml NSS**.

SEIZURES
Diazepam IV or **IM** or **PR**
Adult: **Slow 10mg**
Child: **0.4mg/kg** (max 10mg)
Can repeat twice if convulsions do not resolve in 10 minutes

HYPOGLYCAEMIA = blood sugar <70mg/dL (3.9 mol/L)
- If dextrose **40-70mg/dL**:
  - Give oral sugar solution (water mixed with sugar) or sweet drink to prevent severe hypoglycaemia.
- If dextrose **<40mg/dL (<2.2 mmol/L)**:
  - **If able to drink**: give oral sugar solution (water mixed with sugar) or sweet drink
  - **If unable to drink e.g. in coma**: insert IV cannula and give Adult/Child**: 5ml/kg 10% dextrose bolus,** Neonate **2ml/kg 10% dextrose**

ANAPHYLAXIS:
Adrenaline IM: 1 in 1,000 (1mg/ml)
Give undiluted IM in the thigh

>12yrs/Adult:	**0.5ml**
6yrs-12yrs:	**0.25ml**
6m-6y:	**0.12ml**
<6m:	**0.05ml** (use 0.5ml insulin syringe)

Chlorpheniramine IV:
Give STAT over 1 minute

Adult:	**10-20mg**
12–18yrs:	**10mg**
6–12yrs:	**5mg**
6m–6yrs:	**2.5mg**
<6m	**250mcg/kg** (max. 2.5mg)

Hydrocortisone (slow IV or IM):

>12yrs/Adult	**200mg**
6-12yrs:	**100mg**
1-5yrs:	**50mg**
<1yr:	**25mg**

Figure 4.5 Communication tool

ISBAR communication tool (Communication should be done in private place to protect patient confidentiality)	
IDENTIFICATION	Identify yourself and your role (*"Hello, I am Paw Say from WPA IPD"*). Check that you are speaking to the right person (*"I am looking for the lab in charge"*) Identify the patient and diagnosis (*"I am calling about Saw Kyi, 40 year old male admitted 2 days ago with sepsis", "I am calling about Naw Mee, 26 year old G2P1 with the previous neonatal death"*)
SITUATION	If it is an emergency, say it first (*"This is an emergency" or "This is not an emergency"*) Explain why you are calling (*"The patient GCS is 4/15 now", "The PID code is wrong on the CBC form"*). This helps the person you are calling to focus attention on the problem.
BACKGROUND	Give the admission date, symptoms or diagnosis, relevant history ("*Saw Kyi was admitted 2 days ago with fever and convulsions. Malaria smear was negative 2 days ago. He is on day 2 of Ceftriaxone.*") Provide the important information only. Too much information can be confusing.
ASSESSMENT	Report your observations. ("*On exam, patient temperature is 40.1C, HR 110. His RR and BP are normal. He responds to pain but cannot talk or follow commands.*") Share your idea of the situation (*"Very sick, we cannot manage at the clinic", "High fever we should do something"* If you do not agree with the person you are calling, you should tell them so there can be more discussion.
RECOMMENDATION or QUESTION	Give your idea for management of the patient (e.g. "*I would like to repeat the malaria smear, CBC and blood culture. Can we insert a foley catheter?*")

Figure 4.6 Discussion with family during and after an emergency

Discussion with Family

When the patient is stable, it is important to discuss the situation with the family. In some cases, referral to a tertiary hospital (high level) is possible and can help the patient recove. In other cases, referral may not help the patient recover. You may need to consider the family environment when discussing the patient's condition.

Figure 4.7 Normal vital signs by age

Age	Respiratory Rate (RR) (breaths per minute)	Pulse Rate (PR) (beats per minute)	Systolic BP (SBP) (mm Hg)	Urine output
28 days[a] - 2 months	<60	110-160	Use cap refill or PR instead	At least 1ml/kg/hr
2 - 12 months	<50	110-160	Use cap refill or PR instead	At least 1ml/kg/hr
1 - 5 years	<40	100-150[b]	80-100 or use PR	At least 1ml/kg/hr
5 - 12 years	<30	80-120	90-110	At least 1ml/kg/hr
>12 years	<20	60–100	100-120	At least 1ml/kg/hr
Adults	12–20	60–100 (may be 40-60 in well trained athlete)	90-140[c] see note below	At least 0.5ml/kg/hr

[a] For normal vital signs range in neonates, see neonatal guidelines.
[b] PR of 150 may be too high for 5 yo. Check the lema or previous IPD charts to see what the patient's normal PR is.
[c] BP can be different in each patient– for some people SBP of 90 is normal. If a patient's SBP is usually 140 and now it is 90 this could be a sign of shock. Check old patient records for baseline BP.

4.3 SHOCK

DEFINITION
In shock, the blood flow (and blood volume) is not enough to keep the person alive. The vital organs (e.g. brain, heart) do not get enough blood and oxygen to work.

CAUSES

1. **HYPOVOLEMIC SHOCK** (Shock caused by loss of blood or fluids):
   - Severe bleeding anywhere in the body (e.g. trauma, ectopic pregnancy, ruptured aorta aneurysm)
   - Severe fluid loss (e.g. severe vomiting and diarrhoea, burns, severe ascites, severe dengue)

2. **VASODILATORY SHOCK** (Shock caused by widening of the blood vessels):
Most common causes:
   - Bacterial infection (**septic shock**)
   - Severe allergic reaction (**anaphylactic shock**)
   - Severe brain injury or bleeding (**neurogenic shock**)
   - Taking of certain drugs or poisons

3. **CARDIOGENIC SHOCK** (Shock caused by weak pumping of heart = heart failure):
Most common causes:
   - Chronic severe anaemia
   - Vitamin B1 deficiency, beri beri
   - Valvular heart disease (damaged heart valve)
   - Abnormal rhythm of the heart: too fast (tachycardia) or slow (bradycardia)
   - Lung collapse (pneumothorax)
   - Heart attack (myocardial infarction)

4. **SEPTIC SHOCK** (shock caused by the effects of an infection on the body)
   - Any severe infection

5. **ANAPHYLACTIC SHOCK** (Shock caused by a severe allergic reaction):
Causes:
   - Severe allergic reaction e.g. penicillin, peanuts

SIGNS AND SYMPTOMS

Signs and symptoms can vary with the different kinds of shock, but some are common in most patients. *See Figure 10* for normal vital signs in children.

- **Fast and weak pulse** (>100 bpm in adults).
- **Fast, shallow breathing** (> 30 respirations per minute in adults).
- **Cold, sweaty ('clammy') skin** occurs in most shock patients. An exception is the flushed skin in the early stages of vasodilatory shock (for example, in septic shock).
- **Hypotension** (low blood pressure) – Systolic BP < 90 mmHg occurs in most shock patients.
- **Low urine output** (= oliguria): urine output less than 0.5ml/kg/hr in adults and 1ml/kg/hr in children
- **Change in mental state**: first patients are agitated, then confused, then drowsy and then in coma

Low BP is a late sign of shock, do not wait for low BP in treating a patient with other signs of shock. Use pulse rate instead of BP to detect shock in children.

In **SEPTIC SHOCK** you also find:

- High or low temperature.
- History of chills before the fever started.
- Warm skin.

In **ANAPHYLACTIC SHOCK** you also find:

- Sometimes a history of taking certain medicines (especially penicillins and anti-inflammatories [NSAID, e.g. ibuprofen, diclofenac]), of insect bite, or ingestion of some food (especially seafood and nuts). Symptoms of anaphylaxis can last from 5 minutes to several hours
- Oedema (swelling) of lips and throat which makes breathing difficult
- Wheezing
- High BP before it drops to low levels
- Sometimes an itchy rash quickly spreading over all the body
- Sometimes vomiting and diarrhoea

EMERGENCY TREATMENT

Note:** For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 4.8 DRS ABCDE chart for shock

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **SHOCK**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) **Adrenaline nebuliser** 5ml STAT if anaphylactic shock and airway swelling or stridor
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	**Oxygen** (high flow) **Salbutamol nebuliser** Adult/>5yr 5mg; Child <5yr 2.5mg STAT if have wheeze (consider anaphylactic shock) Position patient: If dyspnoea sit up right (but if very low BP raise legs to level above head)
C	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in 2 biggest (16G or 18G) IV cannula – take bloods e.g. Hct, CBC, MS, BC, dextrose etc. If signs of shock give fluid bolus NSS or R/L if diarrhoea (unless cardiogenic shock)
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	*For details on specific treatment see below* Septic shock: ceftriaxone Anaphylactic shock: adrenaline IM, chlorpheniramine, hydrocortisone Cardiogenic shock: furosemide +/- vitamin B1 Give dextrose if low
E	GCS/BCS/AVPU Expose and examine all over body	Review notes and charts History, further investigations, treatment plan
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

Other emergency treatment for shock depends on the cause.

1. HYPOVOLEMIC SHOCK: BLOOD/FLUID LOSS

- If bleeding stop by applying pressure
- Give IV fluids **NSS Adult: 500ml-1L STAT; Child 10-20ml/kg STAT** (or R/L if diarrhoea). If severe hypovolaemia may need to give at least 2L in the first hour in adults or 40 mL/kg in children.
- If there is still bleeding, fluid replacement must include ongoing losses: this could mean giving 2L of fluids per 1 hour in adults.
- Shock from blood loss requires **blood transfusion**, several units may be necessary.

AIM TO REPLACE 2-3 TIMES THE ESTIMATED LOSS
e.g. if loss is 1L then the patient will need 2-3L rapidly

2. SEPTIC SHOCK

- Give IV fluids **NSS Adult: 500ml-1L STAT; Child 10-20ml/kg STAT** (or R/L if diarrhoea). Re-assess vital signs after fluid bolus.
- Give high doses of antibiotics for severe infections: IV **ceftriaxone** (or IM if cannot get IV access). Use ceftazidime if suspect melioidosis, meropenem if high suspicion of ESBL. If possible, take blood, urine, CSF or other body fluid (e.g. pus) samples before starting antibiotics.
- Try to find the source of the infection.

3. ANAPHYLACTIC SHOCK

- Drug or blood infusions should be stopped immediately.
- Give IV fluids **NSS Adult: 500ml-1L STAT; Child 10-20ml/kg STAT.** You may need to give at least 2L in the first hour in adults or 40 mL/kg in children.
- Give **medication** for anaphylactic shock

Figure 4.9 Medications for anaphylactic shock

<table>
<tr><th></th><th colspan="2">ADRENALINE
IM: 1 in 1,000
(1 vial = 1ml = 1mg)</th><th colspan="2">CHLORPHENIRAMINE
IV or IM
(1 vial = 1ml = 10mg)</th><th colspan="2">HYDROCORTISONE
SLOW IV OR IM</th></tr>
<tr><td rowspan="2">ACUTE PHASE</td><td>>12yrs/Adult:
6yrs-12yrs:
6m-6yrs:
<6m:</td><td>0.5ml
0.3ml
0.15ml
0.01ml/kg</td><td>Adult:
12–18yrs:
6–12yrs:
6m–6yrs:
<6m</td><td>10-20mg
10mg
5mg
2.5mg
250 mcg/kg
(max. 2.5 mg)</td><td>>12yrs/Adult
6-12yrs:
1-5yrs:
<1yr:</td><td>200mg
100mg
50mg
25mg</td></tr>
<tr><td colspan="2">Repeat dose every 5-15 minutes until BP and pulse are back to normal</td><td colspan="2">Give STAT over 1 minute</td><td colspan="2">(Can also use dexamethasone). IV steroids take time to have effect and are not emergency drugs</td></tr>
<tr><td rowspan="2">AFTER ACUTE PHASE</td><td colspan="2" rowspan="2">Not required
but keep monitoring for 12-24h because anaphylaxis my have a 2nd phase reaction.</td><td colspan="2">Continue QID, switch to PO chlorpheniramine when improved:</td><td colspan="2" rowspan="2">Can repeat hydrocortisone 3-4 times per day if required (e.g. low BP, persistent shock)

Switch to PO prednisolone when improved/stable.</td></tr>
<tr><td>>12yrs/Adult:

6-12yrs:

3-5yrs:

1-2yrs:</td><td>4mg QID
(max 24mg/d)
2mg QID
(max 12mg/d)
1-2mg QID
(max 6mg/d)
1mg BID
(max 3mg/d)</td></tr>
</table>

4. CARDIOGENIC SHOCK

- Treat the cause (e.g. acute heart failure, anaemia, beriberi).

GENERAL REMARKS

Careful monitoring in all patients of:

- Vital signs (pulse rate, blood pressure, respiratory rate) every 15 minutes.
- Urine output (consider a urinary catheter) – minimum output should be at least 0.5ml/kg/hr in adults and 1ml/kg/hr in children.
- Fluid balance chart: record all fluid input and all fluid losses: urine, blood.
- Lung crepitations and/or rising respiratory rate may indicate too much fluid.

DIAGNOSIS

Determine the cause of shock AFTER the patient is stabilised (use DRS AB-CABDE/S, *see p.13*)

TREATMENT

Try to identify the underlying cause and treat as above.

LONG-TERM MANAGEMENT

Shock is an acute condition – if you do not manage to improve the patient's vital signs rapidly, he/she will die. If the condition improves and vital signs return to normal (e.g. Adults: pulse <100 bpm, systolic BP ≥90 mmHg, urine output >0.5ml/kg/hr and mental condition improves) adjust the rate of infusion to 1L in 6hrs.

PREVENTION

Once someone is in shock, the sooner shock is treated the less damage there may be to the person's vital organs such as the kidney, liver and brain. Early first aid and emergency medical help can save his or her life. People who have a history of a severe allergy reaction should carry injectable adrenaline (epinephrine) and chewable antihistamine (if available) to use in case of anaphylaxis. They should wear a bracelet or necklace stating their allergy. **Allergies to medications should be written in the patient lemma and highlighted.**

4.4 COMA

DEFINITION

Reduced level of consciousness. There are different degrees of reduced level of consciousness and coma is the most severe.

- Drowsiness — Can be easily woken up by talking or touching them
- Stupor — Can be woken up with strong stimulation (e.g. loud speaking, firm touch)
- Coma — Cannot be woken up

CAUSES

It is important to ask a thorough history from family members. This will help find a cause so you can give appropriate emergency treatment. A careful physical examination is needed, especially if there is nobody who can give a history. Think about fever, trauma, chronic problems. Start emergency treatment even if you do not know the cause.

SIGNS AND SYMPTOMS

Ask questions to the family:

- What is the past medical history of the patient?
- Which symptoms were there before the coma (fever, headache, vomiting, convulsions)?
- Has any medicine been given?
- Did the patient have an accident? If so, when?
- Has the patient taken any poison, medicine, alcohol?

Examine the patient completely and do not forget to check:

- Is the neck soft or stiff?
- Is there a wound or haematoma on the head?
- Neurological exam:
    - Glasgow Coma Scale: There are other scales that measure alertness, such as AVPU (alert, respond to Voice, Pain, Unresponsive) or the Blantyre Coma Scale (BCS – in children <5 yr).
    - Check the pupils; if different sizes consider cerebral haemorrhage. Refer to hospital.
    - Check that the tone of the limbs is symmetrical (left/right) and the same in arms and legs (stroke, spine injury).
- Breath: alcohol, smell of fruit (diabetic), smell of urine (uremic coma)
- Skin: rash, cyanosis, jaundice, pallor

EMERGENCY TREATMENT

Note:** For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 4.10 DRS ABCDE chart for coma

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **COMA**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed – be careful if there is a history of trauma or if unknown. Suction if needed (and available)
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	**Oxygen** (high flow) **Nebuliser** if wheeze Position patient: If dyspnoea sit up right but if very low BP raise legs to level above head
C	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in 2 biggest (16G or 18G) IV cannula – take bloods e.g. Hct, CBC, MS, BC, dextrose etc. Give fluid bolus **NSS** Adult: 500ml STAT; Child 10ml/kg STAT (or R/L if diarrhoea)
D	Check dextrose Any drugs needed	Give dextrose if low Give **medications according to cause** (antibiotics, paracetamol)
E	GCS/BCS/AVPU Expose and examine all over body	Review notes and charts History, further investigations, treatment plan Assess for cause of coma, and treat **Coma position** to prevent aspiration
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

COMA POSITION:

The coma position keeps the airway patent. Put the patient on the right side. (If pregnant turn on to left side for less compression of the abdominal vessels.) One leg is bent at the knee. If the coma follows a trauma e.g. car/motorbike accident do not move the patient to the side (they may have a spine injury).

Figure 4.11 Coma position

Note: This position may be used **only when the patient is breathing normally**.

Check respiratory rate and pulse regularly

Put the patient on his back if CPR is needed

Figure 4.12 Coma Scales for adults and paediatrics*new for BCS

Glasgow Coma Scale (GCS)					
Eye opening (E)	Score	Motor response (M)	Score	Verbal response (V)	Score
- Spontaneous	4	- Obeys commands	6	- Oriented/Not	5
- Eyes open to speech	3	- Localises to pain	5	confused	4
- Eyes open to pain	2	- Pulls away from pain	4	- Confused	3
- Eyes stay closed	1	- Flexes abnormally to pain	3	- Inappropriate words	2
		- Extends abnormally to pain	2	- Sounds, no words	1
		- No movement	1	- No sounds	
Total score is between 3 and 15: A score below 5 suggests poor outcome depending on cause, especially in trauma. A score below 8 indicates severe coma.					

Figure 4.12 Coma Scales for adults and paediatrics*new for BCS (continued)

Blantyre Coma Score (BCS)					
Eye opening (E)	Score	Motor response (M)	Score	Verbal response (V)	Score
- Watches or follows (e.g. mother's face)	1	- Localises painful stimulus (pressure on sternum with knuckles of one hand)	2	- Cries inappropriately with painful stimulus, or if verbal, speaks	2
- Does not watch or follow	0	- Withdraws limb from painful stimulus	1	- Moan or abnormal cry with painful stimulus	1
		- No response or not appropriate response	0	- No vocal response to painful stimulus	0
Total score is between 0 and 5: Minimum score: 0 (poor), Maximum score: 5 (good), Abnormal score: ≤4					

For example:
Patient opens their eyes when you tell them to open them **E=3**
When you cause pain e.g. pinch the trapezius muscle the patient touches the area with their hand **M=5**
When you ask them where they are, they say they 'dog' **V=3**
GCS = 3+3+5 = 11/15

DIAGNOSIS

Look for a cause and treat:

- **Coma with fever** — Malaria, meningitis, encephalitis, sepsis, or other severe infections
- **Coma with or without fever** — Severe hypoglycaemia (dextrose <45mg/dL or <2.5mmol/l)
  Severe dehydration
- **Coma without fever** — Head trauma (accident), poisoning, stroke, cerebral haemorrhage

TREATMENT

Treat the cause. If you do not find a cause, or if you find a cause but you do not have the medicine to treat it, consider referring the patient to hospital.

LONG TERM MANAGEMENT OF COMA

1. Re-position the patient every 2 hours to prevent skin ulcers. Show the family how to re-position the patient. **Remind them not to let the patient lie flat on his back**, because the tongue might block the airway or vomit may enter the airway.
2. Put in a urine catheter. Monitor fluid balance (input/output) in order to avoid dehydration.
3. If the coma is following a head trauma DO NOT use 5% dextrose during the first 48 hours (sugar can worsen the brain damage) **except** in hypoglycaemic patients.
4. Regularly reassess the patient: check the vital signs every 2 hours.
5. Check GCS on admission and then twice a day.
6. Check dextrose twice a day as the patient cannot eat or drink.
7. Wash the patient all over once a day. Clean the patient whenever urine and/or stools are passed. Wash the affected area and do not just wipe with dry cloth or paper. Help the family to do this.
8. Clean the mouth and moisten lips at least 4 times a day. Vaseline applied on the lips prevents cracking.
9. Clean the eyes with NSS and cotton wool. Apply Terramycin Eye Ointment (TEO) BID to avoid conjunctivitis, drying up of cornea, and injury. Drying up of cornea can lead to blindness. Close the eyes with a plaster/tape if they stay open.
10. Teach the family how to do massages and perform passive limb movements every 4 hours to maintain muscle tone and prevent contractions.
11. In prolonged coma consider NG feeding depending on the cause and prognosis (*see malnutrition p.209*). This must be discussed with the doctor.
12. Ask the family not to leave the patient alone.
13. If the patient condition does not improve despite full treatment, see palliative care chapter for end of life care.

4.5 CONVULSIONS

DEFINITION

Convulsions are a **sudden loss of consciousness** with or without cyanosis and **strong rhythmic movements** of the face or extremities. Sometimes the patient passes urine or bites his tongue.

When the movements stop, the patient may remain unconscious and breathe deeply up to 30 minutes. The patient slowly returns to normal consciousness. During this time the patient may be confused, asking the same questions many times (e.g. about what happened to him/her, where he/she is etc.).

CAUSES

During the emergency, think about hypoglycaemia, pregnancy, alcohol or drug use, fever, trauma, or chronic diseases. Start emergency treatment even if you do not know the cause.

EMERGENCY TREATMENT

Note:** For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 4.13 DRS ABCDE chart for convulsions

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **CONVULSIONS**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed **Suction any secretions/vomit** if needed (and available)
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug. Listen to chest	**Oxygen** (high flow)
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**Put in IV cannula** **Take bloods e.g. Hct, CBC, MS, BC etc. (may need to wait till fitting stops)**
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	If fitting continues for more than 3 minutes give: **Diazepam Slow IV or IM or PR** **Adults: 10mg** (1 vial) (if IV max 0.5ml in 30 seconds) **Child: 0.4mg/kg** (max 10mg) can repeat after 10 minutes if needed **When the patient is moving, it can be easier to give first dose IM or PR but IV is quicker and better.** If dextrose low give **IV** Adult and Child: **5ml/kg 10% dextrose bolus** Neonates: **2ml/kg 10% dextrose bolus** Give any other drugs according to cause
E	GCS/BCS/AVPU Expose and examine all over body	History, further investigations, treatment plan. Assess for cause of convulsion and treat. **Coma position** to prevent aspiration after fitting if no respiratory distress
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

Diazepam IV
1 vial = 10mg / 2ml
Give IV injections SLOWLY (max 0.5 ml in 30 seconds)

Diazepam Rectally (PR) or IM
Diazepam PR or IM is NOT diluted
How to give PR:

- Draw up the dose from an ampoule of diazepam into a 1ml syringe
- Remove the needle
- Insert the syringe into the rectum 4 to 5 cm and inject the diazepam solution
- Hold buttocks together for a few minutes

If the patient is still fitting:

- After 10 minutes give a **second dose of diazepam**
- CALL DOCTOR, AND **BEGIN REFERRAL** PROCESS
- After another 10 minutes give a **third dose of diazepam**
- If still fitting after 3 doses of diazepam, we should give IV phenobarbitone but not available so need to refer because the patient is at risk of hypoxia to the brain. Referral is urgent.

After several doses of diazepam, the patient will be asleep and cannot be woken for a while. Monitor vital signs carefully during this time.

DIAGNOSIS

- Check blood sugar for hypoglycaemia.
- Look for signs of infection (meningitis, malaria etc.).
- Ask for past and recent medical history, previous convulsion episodes, and medication taken.

When looking for causes, the next list could be helpful: **remember AEIOU**
A: Alcohol, **E:** Eclampsia, **I:** Infections, **O:** Organ failure, **U:** Uraemia (= renal failure)

Convulsions with fever	Malaria, meningitis, hyperthermia, encephalitis
Convulsions with or without fever	Hypoglycaemia, severe dehydration, head trauma, amphetamines, alcohol, renal failure (uraemia)
Convulsions in pregnant women	Eclampsia (HBP + oedema + proteinuria), malaria, hypoglycaemia
Repeated convulsions without fever	Brain tumour, cysticercosis
Convulsions without a clear cause	Epilepsy

TREATMENT
Goals of treatment are:

- Stop convulsions quickly.
- Treat fever if present especially in children under 5 as it can be the cause of the convulsions.
- Find and control the underlying cause.
- Prevent complications by protecting the person from injury. Try to prevent a fall. Lay the person on the ground in a safe area. Clear the area of furniture or other sharp objects.

4.6 CHEST PAIN

DEFINITION
Chest pain is any complaint of pain in the chest area.

CAUSES
There can be many emergency causes of chest pain. The cause depends on the description of the chest pain and other signs and symptoms.

Figure 4.14 Causes of emergency chest pain

Location	Substernal pain	Myocardial infarction, oesophageal perforation, esophagitis, severe reflux
	Left sided chest pain	Myocardial infarction, pneumonia
	Right sided chest pain	Pneumonia or other lung related diagnosis, pain from cholecystitis can refer to the right shoulder
	Generalised chest pain	Underlying medical problem (i.e. asthma, gastritis) or musculoskeletal problem
Description	Burning	Usually related to a gastrointestinal diagnosis
	Numbness in left jaw or arm	Myocardial infarction, especially when it also occurs with other symptoms like nausea or chest pain
	Crushing or pressure	Myocardial infarction "feels like someone is sitting on the chest"
	Tearing	A symptom of aortic dissection, a surgical emergency
Association	Worse with exertion	Myocardial infarction, pleural effusion, pneumonia
	Worse with breathing	Rib fracture or contusion, pneumonia
	Worse with moving around	Musculoskeletal

DANGER SIGNS: Chest pain – central (left arm or jaw), severe, 'crushing', sweating, nausea = myocardial infarction (heart attack)

EMERGENCY TREATMENT

Note:** *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 4.15 DRS ABDCE chart for chest pain

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **CHEST PAIN**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available)
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug. Listen to chest	**Oxygen** (high flow) only when oxygen saturation is low. Do not give oxygen if SaO2 is normal if you suspect myocardial infarction because too much oxygen can cause injury to the heart muscle.
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**Put in IV cannula** **Take bloods e.g. Hct, CBC, MS, BC etc.** **Do ECG**
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	If danger signs or ECG shows signs of infarction: give **300mg Aspirin** to treat for myocardial infarction
E	AVPU/GCS Expose and examine all over body	History, further investigations, treatment plan. Assess for cause of chest pain, and treat /refer
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

****IF POSSIBLE, REFER CHEST PAIN IMMEDIATELY TO TERTIARY HOSPITAL FOR FURTHER TREATMENT****

4.7 DIABETIC EMERGENCIES

DEFINITION

Diabetes can cause emergencies when blood sugar is too high or too low. The patient can present unwell or in a coma. ALWAYS CHECK BLOOD SUGAR ON AN UNWELL PATIENT.

CAUSES

A diabetic emergency can be a patient who has a first visit to the clinic or a patient who already has a history of diabetes. If the patient already takes diabetes medicine and is normally well, you must consider other causes for the emergency (i.e. infection, malaria, drugs). Start emergency treatment even if you do not know the cause.

EMERGENCY TREATMENT

Note:** For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 4.16 DRS ABCDE chart for diabetic emergencies

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR DIABETIC EMERGENCIES
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available)
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug, Listen to chest	**Oxygen** (high flow)
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**Put in IV cannula** **Take bloods e.g. Hct, CBC, MS, BC, Dextrose etc.**
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	If dextrose LOW: If dextrose 45-70mg/dL or 2.5-3.9mmol/L: Give oral sugar solution (water mixed with sugar) or sweet drink to prevent severe hypoglycaemia. If dextrose <45mg/dL or <2.5mmol/L: If able to drink: give oral sugar solution (water mixed with sugar) or sweet drink If unable to drink e.g. in coma: insert IV cannula and give Adult/Child: 5ml/kg 10% dextrose bolus (D10W), Neonate 2ml/kg 10% dextrose If dextrose HIGH give IV NSS: Adult: 1L in 30 min Child: 10ml/kg in 1 hour
E	AVPU/GCS Expose and examine all over body	History, further investigations, treatment plan. Assess for cause of high/low dextrose, and treat /refer
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

Conversion formula for mg/dL and mmol/L (glucose)

mg/dL = mmol/L * 18

mmol/L = mg/dL ÷ 18

4.7.1. HYPERGLYCAEMIA

DEFINITION
Dextrose >200mg/dL or > 11.1 mmol/L

CAUSES
- Stress, e.g. recent trauma, shock. Stroke, MI, convulsion or burns
- Sepsis or infection
- New diagnosis diabetes or poor control of chronic diabetes
- Non-fasting glucose measurement
- Drugs, e.g. adrenaline, steroids, diuretics

THINK ABOUT DIAGNOSIS OF DIABETES EMERGENCY IF:
- No history but has symptoms of diabetes
- Has history of diabetes and has been unwell recently or does not take medications regularly

SIGNS AND SYMPTOMS
- Poor appetite
- Coma
- Fast RR
- Ketotic breath (smells sweet)
- Dehydration, vomiting, abdominal pain
- Urine dipstick positive for ketones

TREATMENT
- Insert an IV cannula, **start NSS: This is very important in diabetic emergencies due to severe dehydration caused by glucose in the urine.**
  - Adult 1L in 1/2 hour, then 1L over 1 hour, then 1L over 1-2 hours
  - Add potassium to the IV fluids at a maximal rate of 10mmol/h
  - Patients may need up to 7L fluids over the first 24 hours
  - Always assess the patient between giving more fluids, look for signs of fluid overload
  - Children 10ml/kg in 1 hour (the risk of fluid overload is higher in children)
- For Type 1 Diabetes: If insulin is not available, first start IV fluids then refer to hospital. For Type 2 Diabetes: the blood sugar may decrease with IV fluids and may be treated without referring.

4.7.2. HYPOGLYCAEMIA

DEFINITION
Dextrose <70mg/dL or <3.9mmol/L), Note: <45mg/dL or <2.5mmol/L is severe hypoglycaemia

CAUSES
- Malaria
- Sepsis
- Severe anorexia
- If there is history of diabetes and patient has anorexia (e.g. vomiting or diarrhoea), and still take medications

SIGNS AND SYMPTOMS
- Sweating
- Nausea
- Tremor
- Dizziness, confusion
- Drowsiness, aggressive/irritable
- Convulsion, coma

TREATMENT
- If dextrose 45-70mg/dL or 2.5-3.9mmol/L:
  - Give oral sugar solution (water mixed with sugar) or sweet drink to prevent severe hypoglycaemia.
- If dextrose <45mg/dL or <2.5mmol/L:
  - **If can drink:** give oral sugar solution (water mixed with sugar) or sweet drink
  - **If cannot drink** e.g. in coma: insert IV cannula and give Adult/Child: **5ml/kg 10% dextrose bolus,** Neonate: **2ml/kg 10% dextrose**
- After giving oral/IV dextrose **re-check blood dextrose after 15 minutes** to make sure it is >70mg/dL or 3.9 mmol/L

4.8 GASTRO-INTESTINAL (GI) BLEEDING

DEFINITION
Blood in the vomit or stool.

CAUSES
- Peptic ulcer disease (bleeding)
- Varices (from portal hypertension from liver disease e.g. alcoholism, hepatitis)

SIGNS AND SYMPTOMS
- Will vomit brown liquid (like coffee) or fresh blood and/or will have melaena (black sticky smelly stools). (Remember that patients on iron tablets will have black stools).
- May have signs of shock – tachycardia, low BP, high cap refill, cold peripheries

EMERGENCY TREATMENT
In case of active bleeding:

Note**: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 4.17 DRS ABCDE chart for GI bleeding

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **GI BLEEDING**	
DRS	Danger Response Send for help	Gloves Safe place Call for help	
A	Airway obstruction Speaking, stridor, swelling, secretions	**Suction** (if available)	
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	Oxygen	
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**2 IV cannulas** (biggest size possible 16G or 18G) Take bloods e.g. **Hct, blood group**, CBC, MS, dextrose etc. **Fluid bolus 1L STAT** **Transfuse** if signs of shock	
D	Check dextrose Seizures Pain	See below for doses If UGI bleeding and suspect **PEPTIC ULCER DISEASE** e.g. history of abdominal pain, no risk factors for liver disease: **Omeprazole** OR **Ranitidine**	If suspect **PORTAL HYPERTENSION** e.g. high alcohol intake, chronic hep B or C or signs of cirrhosis discuss with the doctor and consider: **Ceftriaxone** +/- **Vitamin K**
E	AVPU/GCS Expose and examine	History, further investigations, treatment plan	
DISCUSS WITH DOCTOR			
ASSESS RESPONSE – continue cycle with CABDE/S assessment			

SECONDARY TREAMENT
- No food or drink
- Refer to hospital urgently. Patients with GI BLEEDING ARE AT HIGH RISK FOR VERY FAST AND SEVERE BLOOD LOSS. Be careful if you keep them in IPD.

SPECIFIC TREATMENT
If suspect **peptic ulcer disease** (e.g. history of abdominal pain, no risk factors for liver disease)
- Give **omeprazole** IV 40mg (or PO if no IV) or **ranitidine** 50mg IV (diluted to 20ml given over 2 minutes)
- When stable consider antibiotics for *H. pylori* eradication

If suspect portal hypertension from cirrhosis (e.g. history of high alcohol intake, chronic hep B or C or signs or cirrhosis) discuss with the doctor about also doing the following:

- IV **ceftriaxone** 1g OD for 5-7 days – varices are often associated with bacterial infection
- **Vitamin K** IM 2.5-10mg STAT dose
- When stable start **propranolol** 40mg BID

4.9 NEUROLOGICAL EMERGENCY: STROKE

STROKE IS A LIFE-THREATENING EMERGENCY

Using **FAST technique** can be very helpful:

F - Facial weakness: Has their face fallen on one side? Can they smile?
A - Arm weakness: Can the person raise both arms and keep them there? Is there weakness on one side?
S - Speech and communication difficulties: Is their speech slurred?
T - Time: URGENT to transfer to the hospital if you see any single one of these signs.

Note**: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 4.18 DRS ABCDE chart for stroke

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **STROKE**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available)
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	Oxygen
C	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in IV cannula – take bloods e.g. Hct, CBC, MS, dextrose etc. **Note: Do not give BP medication to reduce the BP** as the high BP may be needed to supply the brain with more oxygen
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	Give dextrose if low
E	AVPU/GCS Expose and examine all over body	**If abnormal neurology exam e.g. facial droop, one sided weakness, high tone, increased reflexes → suggests diagnosis of stroke** Review notes and charts History, further investigations, treatment plan
DISCUSS WITH DOCTOR about referral		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

If the stroke is very severe it may be more appropriate not to refer or give treatment.
If severe follow palliative care. Discuss with a doctor.

TREATMENT
Urgent referral to a tertiary (high level) hospital if you see any one of these signs – the quicker the patient receives treatment the more they are likely to survive and recover from their symptoms. For better recovery of neurologic function, patients need treatment within 4.5 hours of the onset of symptoms.

5.1 FEVER

DEFINITION

Fever means increase in body temperature. Axillary and tympanic (ear) temperature more than 37.5°C or 38°C rectally is considered as fever. Fever is a common symptom usually related to viral, bacterial or parasitic infection. For fever in infants *see Appendix 15.*

SIGNS AND SYMPTOMS ASSOCIATED WITH FEVER

- Chills: feeling cold even though body temperature is high
- Rigor: a severe chill with chattering of the teeth and severe shivering
- **Signs of serious illness:**
  - Sepsis and shock
  - Systemic illness: meningitis, seizures, rigid abdomen, rash, etc
  - Special general condition: pregnancy, malnutrition, immune suppression, splenectomy, chronic disease, very young or very old

DIAGNOSIS

- Temperatures can be taken in the axilla, oral cavity, ear canal or rectum. Proper measurement of axillary temperature takes 5 minutes. Any temperature less than 36°C needs to be rechecked.
- **Try to find and treat the cause of the fever**, *see figure 5.1 below*

TREATMENT

- **If fever more than 38°C**:
  - Remove any unnecessary clothing (no extra clothes, no blanket, etc).
  - Wet the patient's skin with tepid (cool not cold) sponging (put water on the whole body). If available, use a fan to cool the wet skin.
- Give **paracetamol** Adults 1g QID (max 4g daily)
  Children 15mg/kg (max 2g daily)
- If temperature still high with paracetamol consider giving ibuprofen (if not contraindicated)
- Keep the patient well hydrated (drinking a lot, IV fluids if cannot drink)
- If the patient is comatose and cannot swallow, give paracetamol PR or IV

Never give aspirin to children under 12 years because of the risk for Reye's syndrome

Figure 5.1 Differential diagnosis of infections for common symptoms

SYMPTOMS	POSSIBLE DISEASE
Chills, headache, sweating, consciousness disorders	Malaria (*see malaria guidelines*)
Headache, neurological signs, neck stiffness, photophobia	Meningitis/Encephalitis
Muscle pain, high fever, rash, headache, nausea/ vomiting	Dengue
Joint pain or swelling, fever, rash	Chikungunya
High fever, red eyes, muscle pain (calves), headache	Leptospirosis
Respiratory signs	Acute respiratory infection
Urinary signs	Pyelonephritis
Diarrhoea with mucus and blood	Bacterial diarrhoea
Abscess, infected skin lesions	Skin infection
Shock, chills	Septicaemia
Painful big liver	Liver abscess
Prolonged high fever	Typhoid fever
Eschar, lymphadenopathy, rash, prolonged fever	Scrub typhus
Prolonged fever with cough and weight loss	TB
Infection not responding to treatment, parotitis (especially children) or prostatitis in men	Melioidosis
Isolated fever, body pain, running nose	Viral infection
Others	Cancer, HIV/AIDS

MANAGEMENT

- If the patient is well and/or you cannot find a clear diagnosis, send home on paracetamol treatment.
- Counsel to drink fluids.
- Follow up if there is no improvement within 48 hours. If you think the patient cannot come back (e.g. lives too far, does not understand disease) admit to IPD for observation.
- Re-examine the patient after receiving the results of a blood smear, especially when it is negative.

If fever occurring > 2 weeks think about TB, HIV, scrub typhus or typhoid.
There are also non-infectious causes of fever (i.e. some cancers, autoimmune disease).
Discuss with doctor.

5.2 HYPOTHERMIA

DEFINITION

Temperature less than 35.5 °C.

Hypothermia can happen in:

- Sepsis
- Neonates, especially preterm
- Severely malnourished children
- Drowning
- Hypoglycaemia
- Diabetes mellitus
- Alcohol abuse

TREATMENT

Mild hypothermia (32-35.5°C)

Treat with passive warming:

- Keep patients warm with blankets
- Try to keep in a warm room or put patient in the sun.

If **no response** to passive warming (normal temperature increase is 0.5-2°C/hour – can be up to 6°C/hour)
OR

Moderate hypothermia (<32°C)

Treat also with active warming:

- Use hot water bags (be careful about burns)
- Make the blankets warm and then give to patient

Severe hypothermia (<28°C)

Additional treatment:

- Move the patient gently and slowly. Moving too quickly can cause ventricular fibrillation (and death).
- Warm the trunk/abdomen **BEFORE** the extremities (so the cold blood from extremities does not suddenly go to central blood circulation and cause worsening hypothermia and hypotension).
- Give warm (heat to 40°C) NSS

Other management:

- Treat the cause. (If temperature increases ≤ 0.67°C/hour with active warming, consider sepsis diagnosis).
- Use kangaroo method (This is a recommended method to keep newborns warm, *see Neonatal Guidelines*).

5.3 FATIGUE / TIREDNESS

DEFINITION

Fatigue/tiredness is a common symptom, especially in old age or when lifestyle/work/family life is under/over stressful. When fatigue/tiredness do not go away with normal measures like sleep, rest and good diet, then they may be symptoms of disease.

DIAGNOSIS

History:

- Symptoms: fatigue/tiredness non-specific so you need to ask many questions about other symptoms. (*See table below*). Remember to ask about sleeping pattern and caffeine intake.
- Social history, including smoking and alcohol.
- Mental health check: ask directly about sadness or depression, stress, worries, family problems, daily activities and appetite. (*see Mental Health, see p.179*)

Examination:

- Physical: Weight, height, check vital signs (pulse rate, BP, temperature, respiratory rate)
- Pallor, lymph nodes, listen to lungs, heart murmur, irregular rate, thyroid, liver (enlarged, firm, hard) big spleen, abdominal masses, observe patient walking (foot drop) and sitting.
- Mental: is the patient giving eye contact, is the patient crying

Figure 5.2 Differential diagnosis for fatigue and tiredness

POSSIBLE CAUSES	SYMPTOMS	INVESTIGATIONS
Infections (viral, HIV, TB etc.)	Enlarged painful lymph nodes, fever, chronic cough/ diarrhoea, rash	NPA, HIV, AFB, CXR
Anaemia (iron deficiency, thalassaemia)	Pallor (enlarged spleen), dyspnoea, heavy menstruation	Hct, CBC, thalassaemia screen, G6PD, GYN consultation
Hypothyroidism	Lethargy, constipation, stiffness, weight gain, dry skin, hair change	TFT
Pregnancy	Tiredness, nausea, dizziness	Urine pregnancy test
Diabetes mellitus	Passing urine very often, weight loss, thirsty	Urine and blood dextrose +/-
Lung disease	Difficulty in breathing, wheeze, cough	CXR, Sputum
Heart problems (heart failure, valve problem, pericardial disease, arrhythmias)	Difficulty in breathing, slow or fast pulse rate, oedema, chest pain	ECG, Echocardiogram (heart ultrasound)
Kidney problems	Oedema, itching, decreased urine	Urine stick and sediment, creatinine, BUN, ultrasound
Gastrointestinal problems	Diarrhoea, vomiting, nausea, epigastric pain	Stool sample
Cancer	Weight loss, enlarged lymph-nodes, pallor, dysphagia	CXR, CBC
Vitamin B1 deficiency (especially in pregnancy)	Numbness or weakness of extremities	
Psychological problems	Depression, anxiety	Mental health depression scale (DSM IV-SCID); counselling team consultation

TREATMENT

- Treat the cause if you can find it.
- If you cannot find a cause, the physical examination is normal and you cannot find any psychological problems: reassure the patient and reassess in 2 week time. Advise the patient to have a good sleep, decrease caffeine intake, rest and maintain a good diet. If you suspect a mental health problem (*see p.179*) explain that such problems can cause fatigue and tiredness. You can ask advice or help from the SMRU counselling team.

PREVENTION

Try to **spend time** with the patient. **Listen kindly** and ask questions. Counsel how to avoid stress, have a healthy diet, and take enough rest. Refer to counselling team if needed. Follow up can also help.

5.4 PAIN

DEFINITION

Pain is an unpleasant subjective sensation that may be a sign of injury or disease. Pain is a reason for a patient to come to the clinic. ****Note: Pain is NOT a diagnosis**** Try to find the disease causing the pain (history, clinical examination) and **always treat** the pain (*see below*).

Post-operative pain relief is very important for better recovery of the patient.

Figure 5.3 Pain scale pictures

DIAGNOSIS

Take the HISTORY of the pain (ask the pain questions):

TIME:	When did the pain start?
ONSET:	How did it start? (Sudden/slowly increasing) What was the patient doing at the time?
DURATION:	For how long: acute or chronic
QUALITY:	What kind of pain? (Words commonly used for pain: sharp, burning, stinging, intense, shooting, dull, steady, aching, radiating, pricking, pressing, etc. If the patient has these words to choose from, he or she can pick out the ones that apply.)
ASSOCIATION:	What makes it better/worse? What time of day is the worst?
LOCATION:	Where exactly is the pain? Does it radiate to anywhere else? Draw on a picture of the body.
SYMPTOMS:	What symptoms are associated with the pain? (fever, cough, dysuria, diarrhoea, constipation, vomiting)
INTENSITY:	How severe is the pain? **Use a pain scale** (0 = no pain and 10 = the most severe pain possible e.g. giving birth). For children you can use the pain scale pictures above.

Examination:

- Patients with severe pain might need painkillers before examination.
- Check especially the area where the pain seems to be localised.

TREATMENT

- Treat the cause if you find it.
- If you do not find a cause of pain and the pain is severe and recurrent, admit to IPD. Give pain relief and review the patient regularly.

Figure 5.4 Treatment options of pain relief

Step 1	**Step 2**	**Step 3**	**Step 4** (consider referral)
Paracetamol (Use **Amitriptyline** for nerve pain)	NSAID e.g. Ibuprofen / diclofenac AND Paracetamol	Weak opioid e.g. Tramadol AND Paracetamol +/- Ibuprofen	Strong opioid e.g. Morphine AND Paracetamol +/- Ibuprofen

*Nerve pain = pain described as burning, stinging, shooting, like shock with electricity, often with tingling, numbness, often chronic pain

Step 4 medication may not be available in all clinics – if not available and is required consider referral to hospital

Do not give aspirin (ASA) in children below 12 years because of risk for Reye's syndrome.
Do not give NSAIDs to patients with asthma; it can exacerbate an asthma attack.

Treatment examples:

- Moderate headache, muscle, joint or bone pain: **paracetamol**. If moderate muscle or joint pain does not improve with paracetamol, start anti-inflammatory drugs (NSAID) like **ibuprofen or diclofenac** if not contraindicated.
- **Amitriptyline low dose** (high doses are use for treatment of depression) could be used for tingling pain in feet, leg or arms (commonly from diabetes mellitus or trauma) and for prophylaxis of migraine headache. Amitriptyline can make patients drowsy, very good to take at night.
- For moderate-severe pain you can use **tramadol**
- **If pain not improved with PO tramadol then needs step 4 medication. This may not be available so consider referral.**

It is important to tell patients never to give more than the maximum recommended dose of painkillers, because overdose can cause death.
If the pain is not controlled they must come back to clinic.

Important points to consider when prescribing:

1. Use oral medication when possible.
2. Combination of painkillers is better than increasing the dose of one medicine e.g. combining paracetamol or NSAID with stronger medication (e.g. tramadol) provides better pain relief than giving each drug alone.
3. Give regular dose of painkillers, not prn. This is very important in post-operative pain management.
4. If taking more than one medication for pain then try to spread out the pain medication in the day e.g. paracetamol QID, ibuprofen TID in between (with each meal).
5. It is important to tell patients about the side effects and what to do if they happen.
6. Do not give ASA, ibuprofen or diclofenac for epigastric pain. These medicines worsen gastritis and peptic ulcer disease.

Additional Therapy

- Pain may be accompanied with other symptoms such as nausea or anxiety. Pain treatment includes management of the side effects of pain.
- Medication to treat nausea: e.g. **metoclopramide**.
- For patients with very severe diseases and for those who are dying, pain medication alone is usually not enough. As a health worker you should keep the patient as comfortable as possible – not just physically. *See Oncology and palliative care, p.223.*
- **Corticosteroids** (e.g. prednisolone) may have some pain relief effects and reduce anorexia in palliative care patients but have many side effects. Do not start corticosteroids without discussing with the doctor.

Common Side Effects

- NSAIDs e.g. ibuprofen – gastritis, stomach ulcers and renal failure if taken chronically and especially if elderly (avoided by taking with meals, stop if epigastric pain/blood in stool/melaena). If possible avoid in very old patients and use just paracetamol.
- Tramadol – confusion (especially in elderly), drowsiness, constipation.

5.5 CONFUSION

DEFINITION

Confusion is a change in the mental state of a patient. It can be acute or chronic and can be caused by many different things. It is important to rule out any diseases that can be treated to reverse the confusion before diagnosing the patient with a long-term confusion problem e.g. dementia.

CAUSES

- Infections e.g. meningitis, cerebral malaria, encephalitis, sepsis, syphilis, AIDS
- Metabolic e.g. hyper/hypoglycaemia, vitamin B1 deficiencies
- Endocrine disorders
- Neurological e.g. raised intracranial pressure, head trauma, stroke, brain tumour
- Electrolyte abnormality e.g. low sodium
- Drug side effect e.g. steroids, opioids
- Withdrawal of substances
- Dementia (slowly developing confusion over years)

DIAGNOSIS

History:

- Important to find out how long the symptoms have been going on for – hours, days, months, years – it is better to ask the family because they can give a better history.
- Has the patient taken any medication/drugs, is the patient currently intoxicated?
- Any trauma?
- Any other symptoms e.g. headache, fever.
- Examine and **investigate case by case for causes of confusion.**

TREATMENT

Treat the underlying cause

For emergency management of chest pain *see p.23*

1.1 HYPERTENSION*UPDATE

DEFINITION

1. **HYPERTENSION, OR HIGH BLOOD PRESSURE (HBP)** is a Systolic BP (SBP) ≥140mmHg and/or Diastolic BP (DBP) ≥90mmHg (**≥140/90mmHg**).
   - Hypertension is a risk factor for stroke, heart attack, and renal failure.
   - The cardiovascular risks of HBP are greater if there are other risk factors such as age (>60 years), gender (males > females), poor diet, smoking, high blood cholesterol, diabetes mellitus and if the patient already has heart disease or kidney disease.

2. **MALIGNANT HYPERTENSION** is very high blood pressure (SBP >180 OR DBP >110) that acutely affects one or more organs. **This is an EMERGENCY.** *See Figure 6.1 for signs and symptoms.*

3. **PRE-ECLAMPSIA** is a very severe condition in pregnant women with HBP near the end of pregnancy. It can also occur post-partum. This condition is very different from essential hypertension and treatment is also different. (*See Obstetric Guidelines*)

CAUSES

Most of the time (95%) the cause of HBP is unknown. It is then called '**Essential Hypertension**'

Other causes are rare (5%). If there is a cause it is called '**Secondary Hypertension**':

1. High alcohol intake and smoking
2. Obesity
3. Pregnancy (pre-eclampsia)
4. Kidney diseases
5. Endocrine disorders of the adrenal gland or other glands
6. Medicines and drugs: prednisolone, contraceptives, amphetamines (YaBa), NSAIDs, salbutamol
7. Pain and anxiety
8. Congenital heart disease (e.g. coarctation of the aorta)

Think of secondary hypertension especially if the patient is young (eg. <30 years old) or if there is another disease.
See Appendices 12a and 12b for normal blood pressures in children*new.

SIGNS AND SYMPTOMS

Most patients do not have symptoms. Some patients suffer from headache, dizziness or fatigue. Remember to assess for complications of HBP.

COMPLICATIONS

Figure 6.1 Complications of ACUTELY high blood pressure (EMERGENCY)

Malignant Hypertension

This is a condition of very high blood pressure (SBP >180 OR DBP >110) AND where there is damage to organs (brain, retina, kidneys or heart) because of the lack of blood flow. This causes:

- **General symptoms:** nausea, vomiting
- **Brain:** neurological changes e.g. temporary loss of speech or vision, numbness, confusion, restlessness, convulsion, coma or stroke
- **Retina:** acute visual problems
- **Kidneys:** acute renal failure
- **Heart:** acute heart failure, aortic dissection (tear in aorta – causes severe chest pain, may cause different BP measurements in right and left arms)

Complications of CHRONIC high BP and poor BP control:
If patients have high blood pressure for a long time, they may get complications/symptoms below:

Peripheral blood vessels: Blood vessel damage can cause leg pain when walking (**claudication**).
Central Nervous System:

- **Stroke** is a complication of HBP. **Transient ischemic attacks** and **subarachnoid haemorrhage** are more common in patients with HBP.
- **Eyes:** Damage to the **retina** which becomes more severe if the HBP is more severe. This leads to poor vision but blindness is rare.

Heart: There is a higher incidence of heart disease associated with HBP mainly because of **ischaemic heart disease**. HBP puts a lot of pressure on the heart and may lead to **left ventricular hypertrophy** (thickening of the heart muscle so it doesn't work as well). Severe hypertension can cause **left heart failure. Atrial fibrillation** (irregular heart rhythm) is common.
Kidneys: Kidney disease can cause HBP but chronic HBP can also cause **chronic kidney failure**.

DIAGNOSIS

- You can diagnose HBP only after abnormal values on 3 different days. This may be difficult if the patient cannot follow up.
- If high BP is only seen at one visit and not then the next visit, the patient does not have high BP.
- HBP is a chronic disease and needs daily medicine. Follow up and medication is very important for the life-long management of HBP.
- Healthy adults should have their BP checked every 3 years.

If there is severe HBP (systolic BP > 180 OR diastolic BP > 110) AND/OR complications, treatment should be given immediately for severe HBP (*see Figure 6.2*).

How to take Blood Pressure
The patient should rest quietly for ≥ 5 minutes before measuring the BP (sitting position). Check the BP on the same arm for the same patient (write on the lema which arm you use). Write the BP result to the nearest 2mmHg. Do not write measurements so that all readings end with 0 or 5.

ASSESSMENT OF HBP

1. Obtain accurate BP measurements 3 times at 3 different days for high BP diagnosis
2. Careful history to identify risk factors/underlying cause
3. Full examination to identify risk factors/underlying cause
4. Urine dipstick for blood/protein/glucose
5. Check a fasting dextrose on all patients
6. If available, check cholesterol (total cholesterol, LDL, HDL and triglycerides)
7. In <40 years old consider investigating for secondary causes of hypertension- discuss with doctor.

TREATMENT
Explain to patients:

- HBP may not cause symptoms. They have a higher risk for stroke and heart attack.
- This risk can be decreased by lifestyle changes and medication.
- The medication will not cure HBP but will decrease the risk. They must take medication and follow up for the rest of their life.

Lifestyle advice for all patients

- Eat less salt
- Healthy diet e.g. avoid fatty foods / eat more vegetables and fruit – *see p.71 for diet counselling*
- Lose weight if overweight or obese
- Drink less caffeine and other caffeine containing products.
- Stop alcohol and smoking. If cannot stop try to decrease.
- Exercise at least 30 minutes most days of the week.

When to start medication for HBP (*see Figure 6.2*):

- (If suspect HBP because of anxiety or because patient is unwell wait until the patient is calmer or better and repeat)

- Treat using *Figure 6.2, Treatment options according to BP measurement..*
- **Only start medication if the patient has HBP 3 times on 3 different days**. This means that the high BP is not only a single episode. Also if the patient follows up for BP check they will be more likely to follow up for BP checks and take their medications safely.
- The patient needs to take the medication regularly; if they do not take it regularly this can be more dangerous for the patient (especially with beta blockers).
- **When the BP is stable on one or two medications then continue the same dose.**
- If available, check an **ECG** before starting any new high BP medication. If there is a complication from the medicine (e.g. bradycardia from metoprolol) then you can compare to pre-treatment ECG.

When following up:

- If the patient is not attending regular follow up then STOP the medication. It is not good if the BP is going up and down because the patient is stopping and starting the treatment.
- Before increasing the dose or changing the medication make sure you check that the patient has been taking the drug every day as instructed.
- Before starting enalapril do a pregnancy test and baseline BUN and creatinine if possible.
- If BP too low with medication, then decrease the dose
- Offer annual BP screening for end organ damage and comorbidities

Figure 6.2 Treatment options according to BP measurement*update

SBP	DBP	Treatment
135-149	85-94	Stage 1 hypertension: Check for co-morbidities (diabetes, heart or kidney problems, previous stroke) Investigate for end organ damage (kidney, heart, eyes). Calculate cardiovascular risk with an online calculator. **Decide if BP medication should be started** (*see Figure 6.3, p.38*) Use protocol if you decide to start medication.
150-179	95-109	Stage 2 hypertension: Check for co-morbidities (diabetes, heart or kidney problems, previous stroke) Investigate for end organ damage (kidney, heart, eyes). Calculate cardiovascular risk with an online calculator. **Start BP medications** (*see Figure 6.4, p.39*)
>180	>110	LOOK FOR ACUTE END ORGAN DAMAGE eyes (papilledema, haemorrhage), pulmonary oedema, heart failure, myocardial infarction (ECG), aortic dissection (check BP in both arms), encephalopathy, stroke, rapidly progressive renal failure (urine dip), eclampsia. **If have acute end organ failure this is a hypertensive emergency.** *See treatment box below*. Consider referral. Discuss with doctor. **No evidence of end organ damage** - This is not an emergency **(stage 3 hypertension)** - Manage with oral BP medication (*see Figure 6.4, p.39*) - Start medication per protocol and follow up next day. Admit to IPD if needed.

Hypertensive emergency

If suspect malignant hypertension (BP >180 OR DBP >110 AND signs of damage to organs):

THIS IS AN EMERGENCY – NEED TO REFER PATIENT (Discuss with doctor)

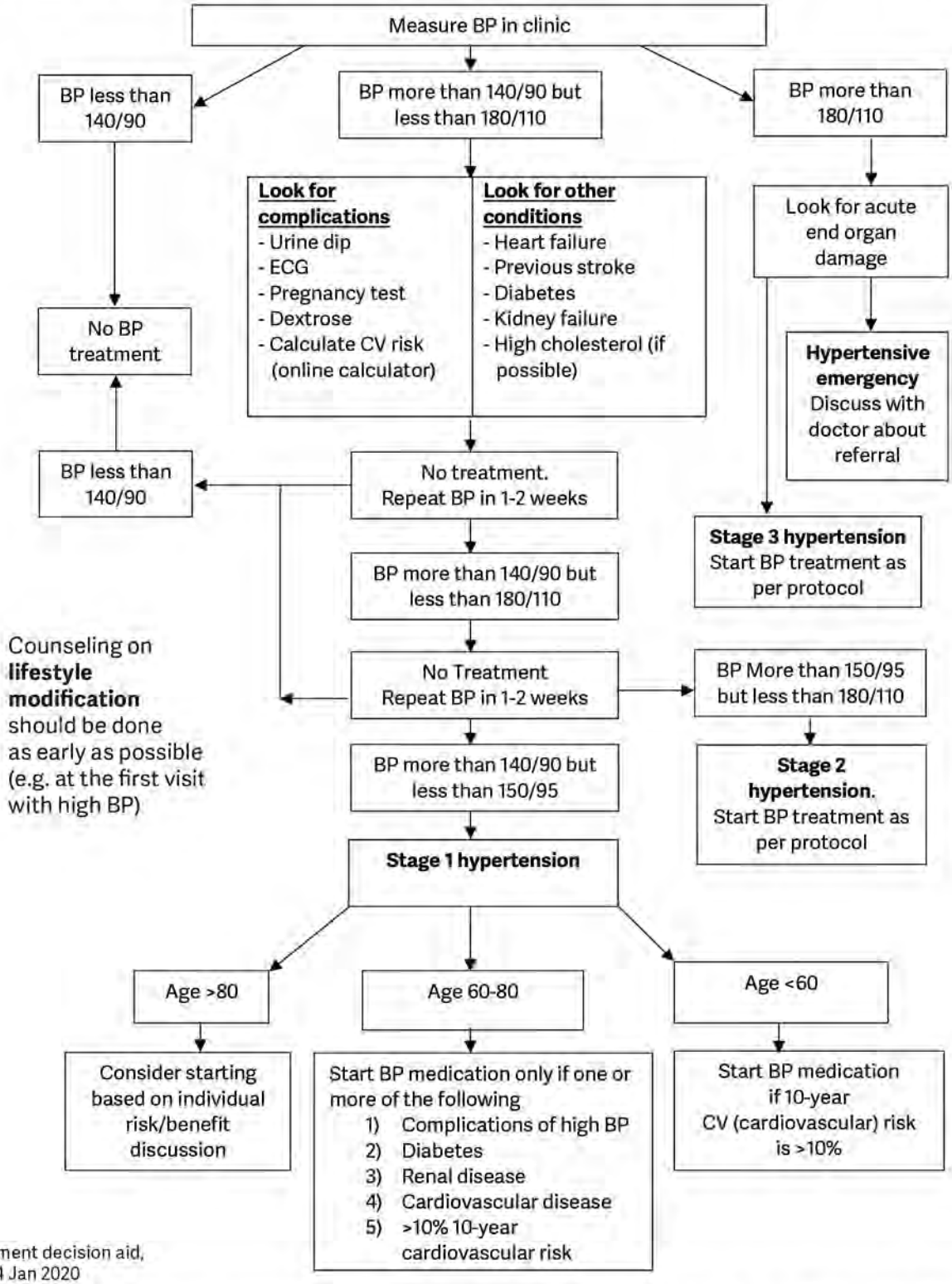
Treatment:

If possible give the patient **furosemide** 20mg PO before referral
Aim for 25% BP decrease in first few hours then more slow decrease afterwards
If cannot refer discuss risks of complication with patient. They need IV BP treatment.
We can only give oral BP treatment at SMRU

****Note**: if suspect patient has had a stroke do not lower blood pressure. This can make stroke worse. Discuss with doctor****

Many high BP medicines are not available at SMRU.
ACE inhibitors (i.e. **enalapril, lisinopril**) are first line treatment for patients <55 years old.
ACE inhibitors can cause kidney malformation in the fetus, so only give with family planning.
Calcium channel blockers (i.e **long-acting diltiazem/nifedipine, amlodipine**) are first line for >55 years old.

Figure 6.3 BP treatment decision aid (based on NICE clinical guidelines)*new

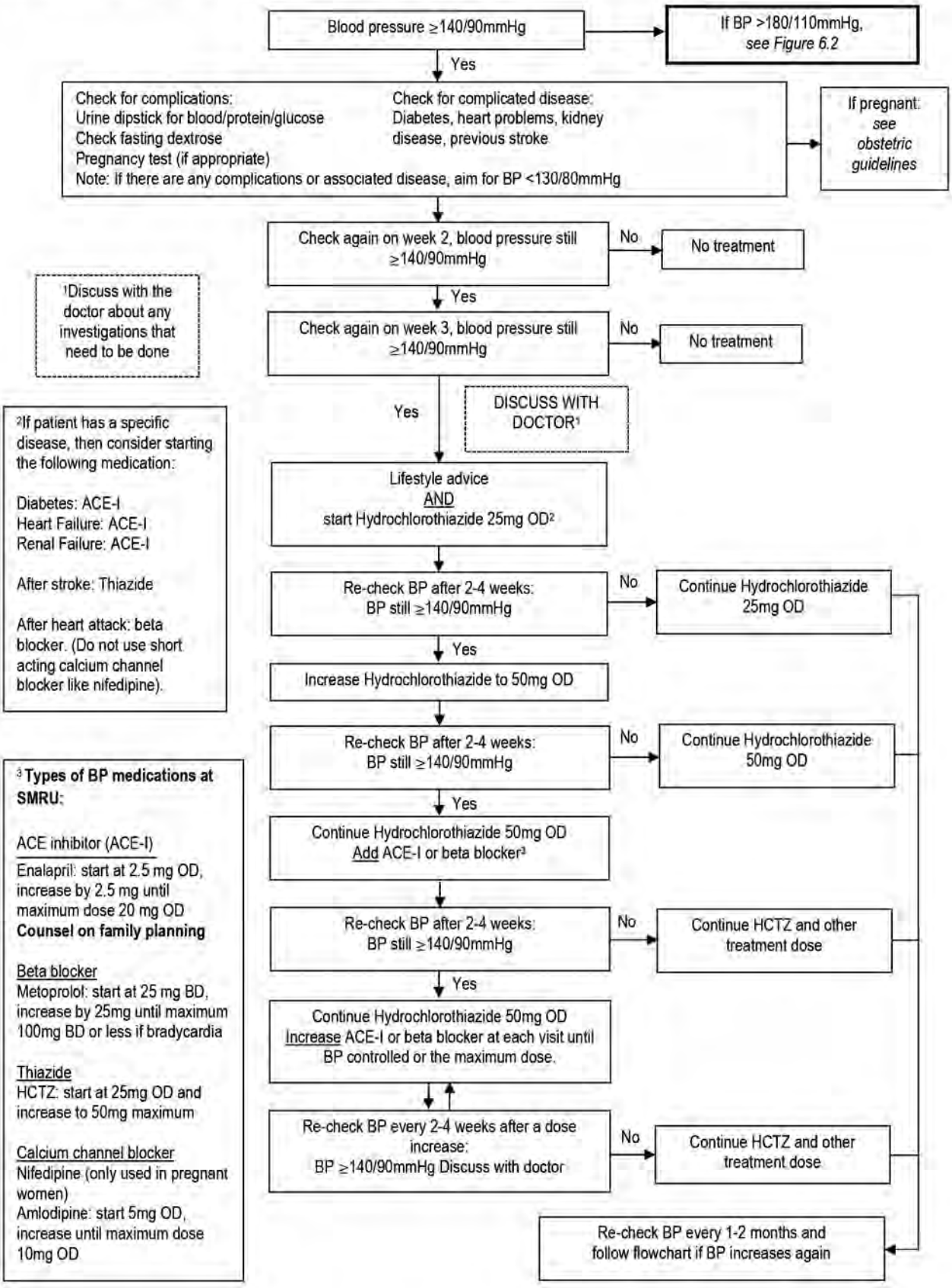


BP treatment decision aid,
Version 4 Jan 2020

* Aspirin may not benefit patients with low cardiovascular risk because of the risk of bleeding. The benefit of aspirin is higher if patients have known cardiovascular disease. Consider aspirin for the patient case by case.

Other drugs like **ace inhibitors** and **long acting calcium channel blockers** are better treatments for high BP but are more expensive.
See Appendix 11 for a different BP medication guideline for other drugs (if available).

Figure 6.4 BP medication protocol for SMRU*update



6.2 ISCHAEMIC HEART DISEASE

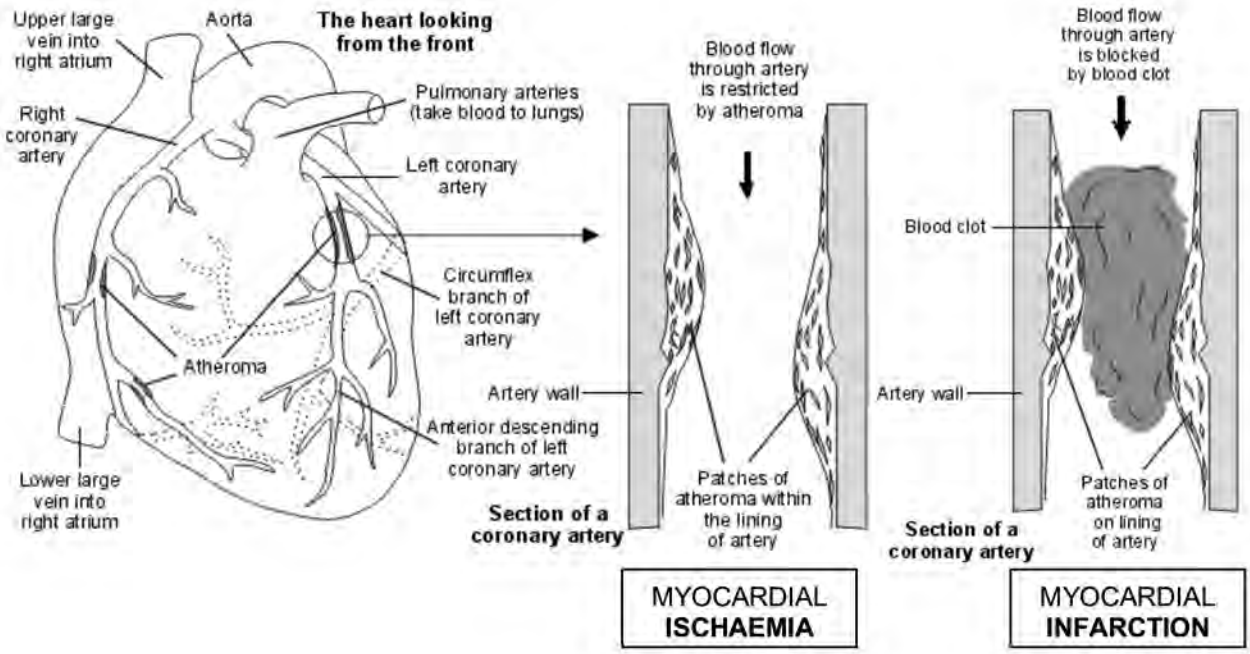
DEFINITION

The heart is a muscle which pumps blood around the body to make sure that the organs in the body have a good supply of oxygen and remove any waste products. The muscle of the heart is supplied with blood by the coronary arteries, which go around the heart. When there is a problem with the blood supply to the heart the lack of oxygen means that the muscle cannot function normally. The main symptom of this is chest pain.

There are two conditions where this happens: myocardial infarction and Ischaemia.

Infarction (myocardial infarction) = *heart attack*. This is an **EMERGENCY**. Part of the heart muscle has died due to a lack of blood supply e.g. from a clot.
Ischaemia (ischaemic heart disease) lack of blood supply causing pain but not muscle death = *angina*. Poor oxygen supply to the heart muscle due to a narrowing of the coronary arteries in the heart.

Figure 6.5 Anatomy of the coronary arteries



RISK FACTORS

Risk factors are the same for a heart attack and angina

- Smoking
- Obesity
- Family history
- Diabetes
- High BP
- Lack of exercise
- High stress
- High cholesterol
- Age
- Male

6.2.1. MYOCARDIAL INFARCTION

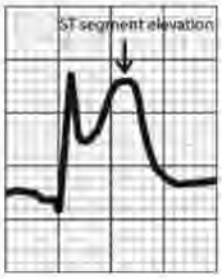
DEFINITION

Heart attack (also known as myocardial infarction (MI)) **is when there is a complete blockage (e.g. from a clot) to the blood supply to the heart causing part of the heart muscle to die. After a heart attack the dead tissue is replaced by scar tissue so the heart cannot pump as well.**

SIGNS AND SYMPTOMS

- Severe sudden onset central or left sided chest pain that may radiate to the left arm or neck that lasts for more than approximately 15 minutes
- Pain is heavy or dull
- Associated with nausea, sweating, shortness of breath

Figure 6.6 ST segment elevation



DIAGNOSIS

This is a clinical diagnosis. There is a specific blood test (**troponin**).
It is released by the heart that shows there is damage to the muscle.
ECG can show ST elevation or depression. Sometimes, the ST segment is normal during an MI.

TREATMENT

- This is an emergency
- **Chew aspirin tablet 300mg PO STAT**
- **Refer immediately to hospital if possible** – this patient needs stronger drugs to break down the clot and may need surgery to open up the arteries

6.2.2. ANGINA

DEFINITION

Angina is when there is chest pain due to a narrowing of the arteries in the heart, often due to atheroma (fatty patches). This means that there is not enough supply of oxygen to the heart muscle (ischemic heart disease) and this causes chest pain. Patients with angina are at higher risk of having a heart attack (*see above*). Angina can be stable or unstable (high risk of turning into a heart attack). For risk factors *see above*.

SYMPTOMS

The patient will complain of chest pain. It is important to classify the angina:

1. **Stable Angina**: chest pain (left or central chest) that comes on with exercise and stops when you sit down/stop exercising.
2. **Unstable Angina**: chest pain (left or central chest) that happens at rest – **This is a very high risk for developing into a heart attack**.

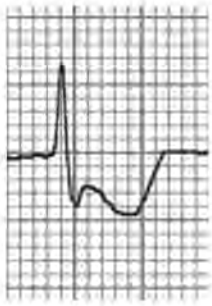


Figure 6.7 ST segment depression

DIAGNOSIS

The same as for MI, but ST segment may be normal also.

TREATMENT

Lifestyle (advise patients to):

- Eat less salt
- Avoid fatty foods / eat more vegetables and fruit
- Lose weight if overweight or obese
- Stop alcohol and smoking: if cannot stop try to decrease
- Exercise at least 30 minutes every day

Medications:

Discuss with the doctor about what treatment is appropriate for each case.
If unstable angina consider referral to hospital because of the high risk of developing heart attack.
Treatments to be considered are:

- **Aspirin** 75-100mg/day (with **anti-ulcer drug** to protect the stomach): makes platelets less sticky so they do not stick to the blood vessel wall and make plaques which block blood flow to the heart. Do not use in patients with a risk for bleeding (haemorrhagic stroke, varices, epistaxis, rectal bleeding)
- Beta-blocker (**metoprolol**): decrease the force and rate of the heart pumping
- ACE-Inhibitor (**enalapril**): prevent a build-up of fluid
- Nitrates **(isosorbide mononitrate**): relaxes blood vessels to allow good blood flow to heart muscle
- Treat underlying diseases like hypertension or diabetes mellitus

6.3 HEART FAILURE

DEFINITION

Heart failure occurs when the heart fails to pump enough blood and provide enough oxygen or energy to the organs. In cases where there is doubt about the diagnosis, response to a therapeutic trial will make the diagnosis clear. Heart failure can be chronic and come on slowly or can be acute and present as an emergency. The two sides of the heart can be affected together or separately (left sided or right sided heart failure). Both have different symptoms.

SIGNS AND SYMPTOMS

Chronic Heart Failure:

Left sided heart failure:
- Breathing difficulties when exercising, which get progressively worse, until difficulties are experienced even when at rest.
- Difficult breathing when lying on the back. The patient uses more pillows to sleep (orthopnoea).
- Dry cough mainly at night +/- pink frothy sputum.
- Crackles (crepitations at lung bases).

Right sided heart failure:
- Abdominal pain, anorexia, nausea, bloating
- Jugular vein distension
- Hepatomegaly (enlarged liver) sometimes painful
- Lower leg oedema, or lower back oedema if lying flat

Acute Heart Failure: (may not have all symptoms)
- Sudden worsening of breathing or cough
- Increased JVP
- Lots of creps bilaterally
- More oedema
- Low SpO2, fast RR
- Cannot breathe when lying flat
- May have history of heart failure (or symptoms of heart failure)

Do not forget to ask about:
- Alcohol/drug use
- Diet (check for B1 deficiency)
- History of chest pain/palpitations

CAUSES

Common causes of heart failure:

1. Hypertension **Check BP**
2. Anaemia **Check Hct/Hb**
3. Beriberi (Vitamin B1 deficiency)
4. Hyperthyroidism **Check TSH**
5. Alcohol, drug addiction
6. Myocardial infarction (heart attack) **Check ECG**
7. Arrhythmia (irregular heartbeat) **Check ECG**
8. Congenital heart disease
9. Valvular disease (heart valves too tight or loose)
10. Rheumatic heart fever **Check ASO titre**

INVESTIGATIONS

- For all patients check: Hct, BP, ECG, fasting dextrose, and thyroid tests if available.
- A blood test called BNP and an echocardiogram (ultrasound of the heart) can confirm the diagnosis of heart failure but these tests may not be available.
- You need to diagnose from symptoms and clinical exam.
- An improvement of symptoms with treatment also helps to confirm the diagnosis.
- If not sure if breathing problems are due to other causes then a chest X-ray may help you, discuss with the doctor, supervisor or team to see if appropriate.

TREATMENT

ACUTE HEART FAILURE

Note: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step*

Figure 6.8 DRS ABCDE chart for acute heart failure

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **ACUTE HEART FAILURE**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	**Oxygen**
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	Salbutamol or Adrenaline nebulisers if wheeze ****Caution: increased heart rate can worsen heart failure**** Position patient: If dyspnoea **sit up right**
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**IV cannula** (biggest size possible 16G or 18G) Take bloods e.g. **Hct, Creatinine, BUN, CBC**, MS, dextrose etc. ****If signs of heart failure DO NOT GIVE FLUID BOLUS**** Insert catheter and monitor fluid balance (fluid IN/OUT) every hour
D	Check dextrose Seizures Pain	**Give** diuretics e.g. **furosemide IV** Adults: **40mg** Child: **1mg/kg** (max 40mg) Repeat the same dose after 30 minutes if no improvement/has not passed urine. Discuss repeat doses with doctor. Consider **vitamin B1 100mg IM** injection Give **digoxin PO only** if atrial fibrillation on ECG (irregular pulse >120 per min)
E	GCS/BCS/AVPU Expose and examine	History, further investigations, treatment plan
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

A treatment dose of **vitamin B1 100mg IM** should be considered. Give diet advice and B1 tablets to prevent Beriberi, especially in alcoholics and heart failure patients.

When the patient is stable, look for the cause of the acute episode and treat it.

Post Emergency Treatment:

- Bed rest
- Stop smoking
- Check weight daily in IPD
- Monitor fluid input and output
- Continue **furosemide** daily
- Adjust dose to weight and BP
- If oedema continues, consider adding another diuretic e.g. **hydrochlorothiazide**
- If patient is already on beta-blockers e.g. **metoprolol** **do not give if have acute heart failure** Start or re-start when acute attack is better
- If available start **enalapril** and **spironolactone,** consider checking electrolytes if available. Family planning if use ACE-I

CHRONIC HEART FAILURE

Assessment:

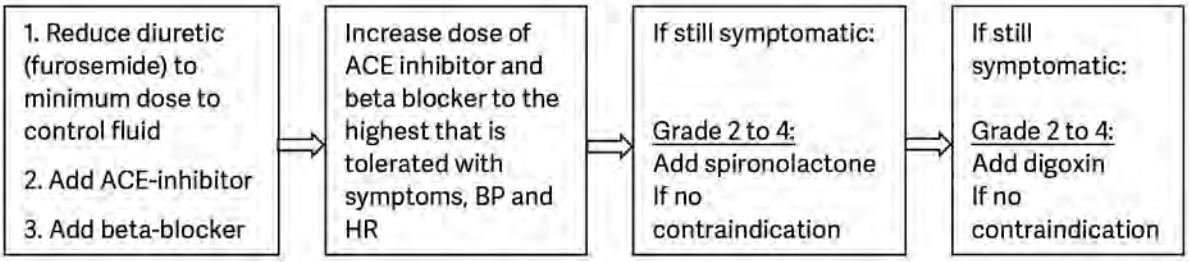
Most of the time, acute heart failure is a complication of a chronic condition. Remember that in the early stages of the disease, the patient will feel OK most of the time. He/she may consider night cough to be bronchitis or lower leg oedema as nothing serious. Once you have made the diagnosis of chronic heart failure you must see the patient regularly (at least monthly) as they will need life-long treatment and care.

Make a detailed clinical exam:
Check heart sounds: listen for new murmur or gallop and compare to previous heart sounds in lemma. Check BP, pulse, SpO2, weight. Left HF signs: crackles in lungs. RHF signs: oedema, jugular veins enlarged, enlarged and painful liver. Grade the dyspnoea following the American Heart Association:

Grade 1: no symptoms	
Grade 2: dyspnoea for major efforts	describe the activity which caused the dyspnoea
Grade 3: dyspnoea for minor efforts	how much can the patient walk or carry before dyspnoea?
Grade 4: symptoms at rest	shortness of breath even when doing nothing

Furosemide will make the patient feel better but will not increase how long they live but ACE-I, spironolactone and beta blocker will increase the patient's life

Treatment for acute heart failure:
1. Lifestyle advice: stop smoking, lose weight, low salt, healthy diet, decrease/stop alcohol and drugs.
2. Restrict fluid intake e.g. 1.5L/day.
3. Check baseline renal function and discuss with doctor if abnormal.
4. Diuretics e.g. **furosemide** to remove the fluid and improve symptoms – check electrolytes 2 weeks after starting and re-check depending on case by case.
5. Add ACE-I e.g. **enalapril, lisinopril or captopril**.
6. If no contraindications add cardio-selective beta blocker e.g. **atenolol, metoprolol, or carvedilol**.
7. If still grade 2-4 add **spironolactone**. This can improve the patient outcome.
8. If still grade 2-4 consider adding **digoxin**. This can improve how the patient feels.



CARDIAC MEDICATIONS (you may need to use alternative treatments if these drugs are not available)
1. **Furosemide**: start 40mg PO OD, maintenance 20-40mg, if resistant oedema 80-120mg daily.
2. **Enalapril**: start with 2.5mg OD for 2 wks, increase every 2 wks if tolerate (max 20mg BID) **Note**: enalapril OD for HBP and BID for heart failure). Follow BP when giving with furosemide.
3. **Metoprolol**: Start at 25mg OD, increase to 50mg BID if HR and BP stable. Follow HR. Do not give if history of asthma. If metoprolol is not available, use only atenolol or carvedilol. Different beta blocker drugs are used for different diseases (e.g propranolol for portal hypertension but not for heart failure).
4. **Spironolactone**: if on ACE-I start at 12.5mg, normal maintenance dose 50mg, (if not on ACE-I start 50mg. Maintenance dose 100-200mg).
5. **Digoxin**: For heart failure start 62.5-125mcg OD (elderly start at 62.5mcg). For atrial fibrillation: 750mcg-1000mcg over 24hrs (in divided doses) then maintenance 125-250mcg. Digoxin can cause severe side effects. Be careful especially if there is renal failure. **Digoxin side effects**: confusion, irregular pulse, low appetite, nausea, vomiting, diarrhoea (GI problem), hyperkalaemia and life-threatening arrhythmias with very fast heart beat.

When to change the treatment? Discuss with team or a doctor if you are not sure.
- Weight is increasing and oedema is appearing: Increase the treatment or add new drug
- Dyspnoea grade is worse: Increase the treatment or add new drug
- BP is getting low (SBP <90mmHg): decrease diuretic treatment and/or enalapril
- If have digoxin intoxication signs, stop digoxin, re-start at lower dose when signs are resolved.
- High risk for digoxin toxicity more likely in elderly and patients with renal impairment
- If there is hyperkalaemia: stop the enalapril and spironolactone
- If the patient is improving or stable: do not change the dose of medication

PREVENTION
Counsel on lifestyle change. Give aspirin if there was a heart attack. Give all patients diet advice and vitamin B1 supplementation.

6.4 RHEUMATIC FEVER

DEFINITION

Rheumatic fever is an inflammatory disease which sometimes follows a *group A Streptococcus* pharyngeal infection. It follows pharyngitis / tonsillitis by 2 to 6 weeks (average 20 days). It is most common in children between 5 and 15 years old. Only 2% of people who have a *Streptococcus* pharyngitis (non-treated or not well treated) will develop rheumatic fever.

SIGNS AND SYMPTOMS

Rheumatic fever affects four sites (joints, heart, central nervous system and skin) and during an attack the patient can have any combinations of these symptoms: **J ♡ N E S** (**J** - joints (arthritis), ♡ - cardiac, **N** – nodules, **E** – erythema marginatum, **S** – sydenham chorea: *see below for Jones criteria*). It is very rare to see patients with acute rheumatic fever. Usually by the time they come to hospital the fever has ended but they present because of symptoms due to permanent damage to the heart valves. They may remember the symptoms of the acute rheumatic fever (maybe months or years before) so it is important to ask their medical history.

Inflammation of more than one joint (**poly-arthritis**), especially the larger joints (knees, ankles, elbows, wrists)	**Chorea**: rapid, involuntary, uncoordinated movements (especially of head, face, hands and feet), which disappear during sleep
Pain and inflammation 'travel' from one joint to another (**migratory arthritis**). It is more common in adult patients. There may be only pain, or sometimes swelling, redness, tenderness. No deformity	**Nodules** under the skin: small (few millimetres to 2cm), mobile and painless nodules especially over bony surfaces and tendons (near the elbows, knees, wrists, ankles, over Achilles tendons, vertebrae)
Heart murmur	**Erythema marginatum**: non-itchy, non-painful rash with a raised edge and clear centre, especially on trunk, thighs and arms. The lesions change frequently
Congestive cardiac failure, enlarged heart	
Pericardial rub	

Other symptoms: There can also be fever, abdominal pain, or nose bleed.

DIAGNOSIS

- There is no one single symptom, sign or investigation which is characteristic of rheumatic fever.
- Here, the diagnosis is based on the 'Revised Jones Criteria'. This has 3 parts:

1. **Evidence of recent Streptococcal infection**:
   - Increase in anti-streptolysin O (ASO) titre
   - Positive throat culture for *group A beta-haemolytic streptococcus*

2. **Major criteria**:
   - Heart symptoms as above: carditis
   - Polyarthritis
   - Chorea
   - Subcutaneous nodules
   - Erythema marginatum

3. **Minor criteria**:
   - Arthralgia
   - Fever
   - Increased CRP or ESR
   - Previous rheumatic heart disease or rheumatic fever
   - Prolonged P-R interval on ECG (if available)

To make a **diagnosis of rheumatic fever there must be**:

1. Evidence of a recent streptococcal infection AND 2 major criteria,
   OR
2. Evidence of a recent streptococcal infection AND 1 major criteria and 2 minor criteria.

DISEASE COURSE

The average course of an attack is about 3 months. Less than 5% of the attacks are longer than 6 months.

COMPLICATIONS

Reactivation of rheumatic fever (5-50%).
Chronic rheumatic heart disease (deformity of one or more heart valves). This is the only long-term problem of rheumatic fever. If severe enough, this can lead to chronic heart failure. Chronic rheumatic heart disease usually has no symptoms for years or decades after the initial episode of rheumatic fever.
Death from congestive heart failure.

TREATMENT

- Bed rest for 2 weeks

Benzathine benzylpenicillin

Child: 50,000 IU/kg IM STAT (max 1.2 million IU)
Adult: 1.2 million IU IM STAT

If benzathine penicillin is not available give **penicillin V** 500mg QID or 15mg/kg QID for 10 days. If the patient is allergic to penicillin, give **erythromycin** 2g or 50mg/kg divided TID for 10 days.

Aspirin 50-100mg/kg/day until all symptoms have gone:
Decrease dose if side-effects occur: ototoxicity, hyperventilation, abdominal problems.

Prednisolone

Treat with prednisolone if there are signs of cardiac problems or if aspirin is not enough to control the joint inflammation:

Child: 1-2mg/kg OD for 2-3 weeks, then slowly decrease over 4 weeks.
Adult: 60-120mg OD for 2-3 weeks, then slowly decrease over 4 weeks.

It may be helpful to use CRP or ESR to guide when you should start to decrease.
When decreasing continue aspirin for 2-3 weeks after stopping prednisolone to avoid a relapse.
Consider giving omeprazole 20mg OD with the prednisolone to protect the stomach lining.

For **Chorea**: Rest
Diazepam or **phenobarbital**.

Treat **heart failure** if the patient has symptoms.

PREVENTION (= PROPHYLAXIS)

Primary prevention (primary prophylaxis): To prevent development of acute rheumatic fever:
All patients with suspected streptococcal tonsillitis should be treated with PO **Penicillin V** for a full 10-day course or a single **IM benzathine penicillin** dose. For treatment in penicillin allergy, *see tonsillitis, p.233.*

Secondary prevention (secondary prophylaxis): To prevent recurrent attacks (reactivation):
All patients who had one attack of rheumatic fever should receive **IM benzathine penicillin** (same dose as treatment) every 4 weeks.

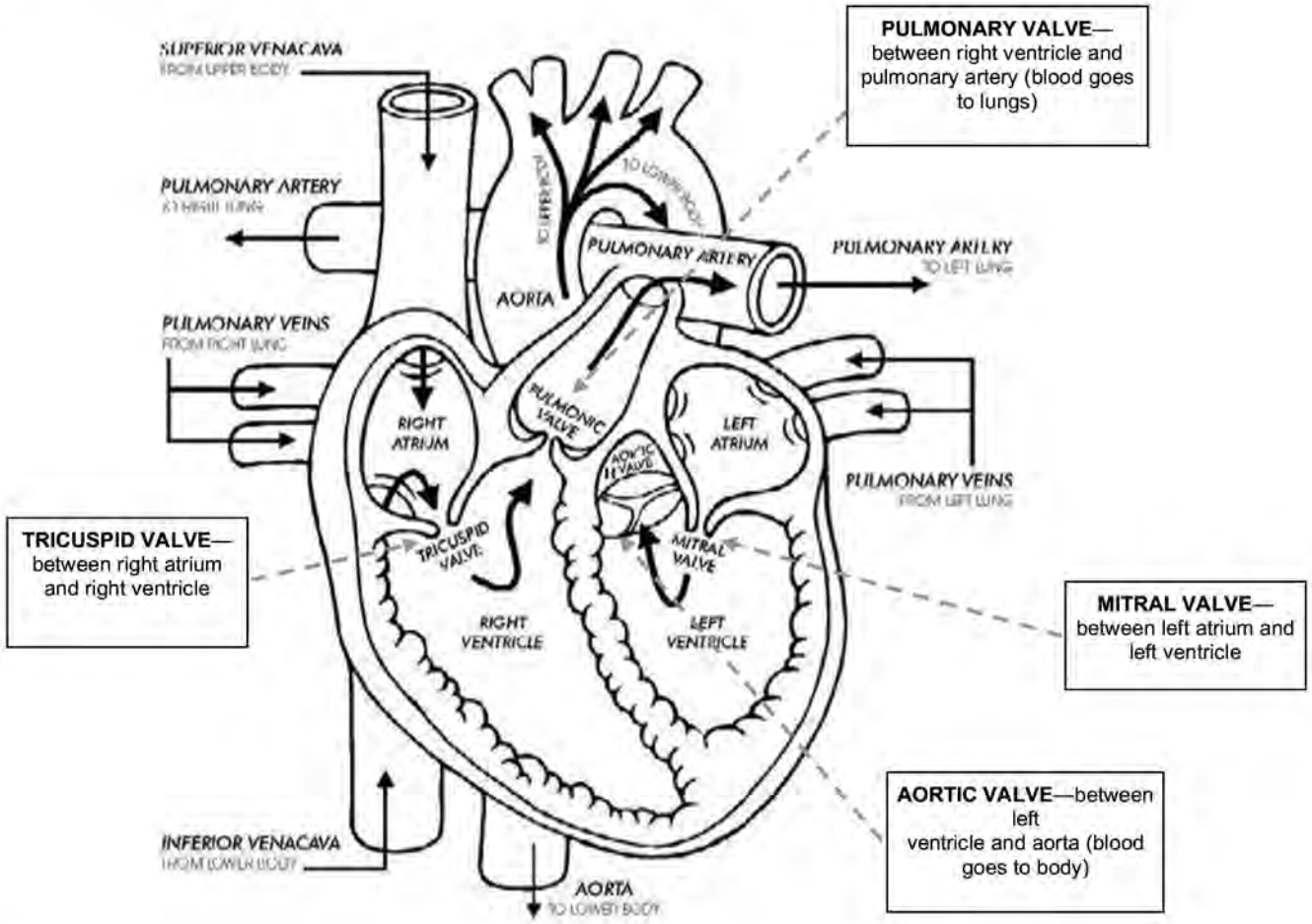
How long to continue giving benzathine penicillin every 4 weeks?
There is no agreement about how long the secondary prophylaxis should be continued. Most guidelines advise continuing at least until the patient is 21 years old and at least 5 years after an acute attack. Some books advise continuing prophylaxis for life if there was heart involvement.

6.5 VALVULAR HEART DISEASE

ANATOMY

The heart has 4 chambers – right and left atrium at the top and right and left ventricle at the bottom. Valves separate the chambers and the major blood vessels. The picture below shows the direction of the blood flow of the blood through the heart by the black arrows.

Figure 6.9 Anatomy of the heart



DEFINITION

The valves in the heart can have problems if they are too stiff and block blood flow (**stenosis**) or if they leak (**regurgitation**) meaning that the heart has to pump harder which can lead to heart failure.

CAUSES

- Congenital abnormalities
- Infections e.g. Rheumatic fever, endocarditis, syphilis
- Heart Disease e.g. Angina (ischaemic heart disease), high BP, cardiomyopathy

SYMPTOMS

- Difficult/fast breathing
- Tiredness
- Dizziness
- Chest pain/angina
- Palpitations
- Symptoms of heart failure: oedema, orthopnoea, frothy pink sputum
- Children/infant: poor feeding, sweating, poor weight gain, chest indrawing
- Aortic stenosis: sudden collapse during exercise

DIAGNOSIS
This is a **clinical** diagnosis.
Listen to the heart sounds:

Normal Heart Sounds:
If the heart is normal, when you listen to the heart sounds there should be two separate sounds:
- First heart sound: Caused by mitral and tricuspid valves closing
- Second heart sound: Caused by pulmonary and aortic valves closing

Systole: the period between the first and second heart sounds
- **Systolic murmur**: Murmur heard during systole. Can be caused by **aortic/pulmonary stenosis, mitral/tricuspid regurgitation, or VSD**

Diastole: the period after the second heart sound before the first heart sound
- **Diastolic murmur**: Murmur heard during diastole. Can be caused by **mitral/tricuspid stenosis or aortic/pulmonary regurgitation**

Examine for heart failure e.g. oedema, raised JVP, crepitations both bases, raised RR, low SpO2, cyanosis.

Echocardiogram (heart ultrasound): Is the best non-invasive way to see if there is a problem with the valve.

TREATMENT
Often a valve that is not working needs surgery to replace it. If possible refer to hospital for further management. Complications of valvular heart disease are congestive heart failure, endocarditis, and heart failure during pregnancy.

6.5 INFECTIVE ENDOCARDITIS

DEFINITION
Infection of the heart which can lead to damage to one of the valves of the heart and lead to complications such as sepsis and death. Infective endocarditis can have a slow onset (subacute endocarditis) or come on quickly (acute endocarditis).

CAUSES
Bacterial cause is most common (most common bacteria is *Staphylococcus aureus*)
- Fungal e.g. candida (more common in immunosuppressed patients)
- Viral (uncommon)

RISK FACTORS
1. Immunosuppressed e.g. HIV, malnutrition, diabetes
2. Intravenous drug use
3. Artificial heart valves
4. Abnormalities of the heart
5. Dental disease

SIGNS AND SYMPTOMS
Think about infective endocarditis if there is a fever of unknown cause (fever DK), and there is a murmur (especially if you know it is a new murmur e.g. not previously written in lemma) and if there are risk factors.

Often symptoms are non-specific:
- New murmur on auscultation
- Fever
- Chills
- Headache
- Muscle pain
- Splinter haemorrhage under nails
- Blood in urine (glomerulonephritis)
- Weight loss
- Shortness of breath
- Cough
- Night sweats
- Joint pains
- Osler nodes/Janeway lesions (bruises on palms and soles of feet)

DIAGNOSIS
Blood cultures should be taken when the patient has fever. Take from 3 different sites at 3 different times. Echo shows 'vegetation' (lump/cluster of bacteria attached to heart valve).

TREATMENT

- Antibiotics (for many weeks) e.g. IV **ampicillin** (4 weeks) and **gentamicin** (2 weeks). The antibiotic and number of weeks depends on the suspected organism and also on the risk factors.
- Repeating blood cultures can tell you when the bacteria is not in the blood anymore. This can help to decide how long to give IV treatment. Do not use oral treatment for infective endocarditis because the drug concentration will not be high enough to treat the heart valves.
- Surgery may be needed.
- If possible do frequent ECGs to monitor for any damage to the heart.

6.6 PALPITATIONS*NEW

To understand this chapter, you may need to ask a doctor for help. It is provided as short and easy to use guide for general clinicians in an OPD where **ECG is available**.

DEFINITION

A palpitation is the feeling of an abnormally strong or fast heartbeat. This is a common complaint in patients. There may or may not be tachycardia.

CAUSES

- Abnormal fast rhythms of the heart
- Congenital heart disease
- Anaemia
- Thyroid problems
- Anxiety or harmless extra beats of the heart.

SIGNS AND SYMPTOMS

Palpitations can come and go. You will need to take a careful history. Ask the following questions:

- When the symptoms started
- How often the palpitations occur
- What makes the palpitations worse or better
- Medication history, alcohol and caffeine use, and smoking

Complications from palpitations:

- Loss of consciousness
- Chest pain
- Difficulty breathing

Risk factors:

- Diabetes
- High BP
- Previous stroke or heart attack
- Kidney disease
- Smoking or alcohol use

DIAGNOSIS

1. Do a careful physical examination. Look for harmful causes of palpitations (*see Figure 6.11, next page*).

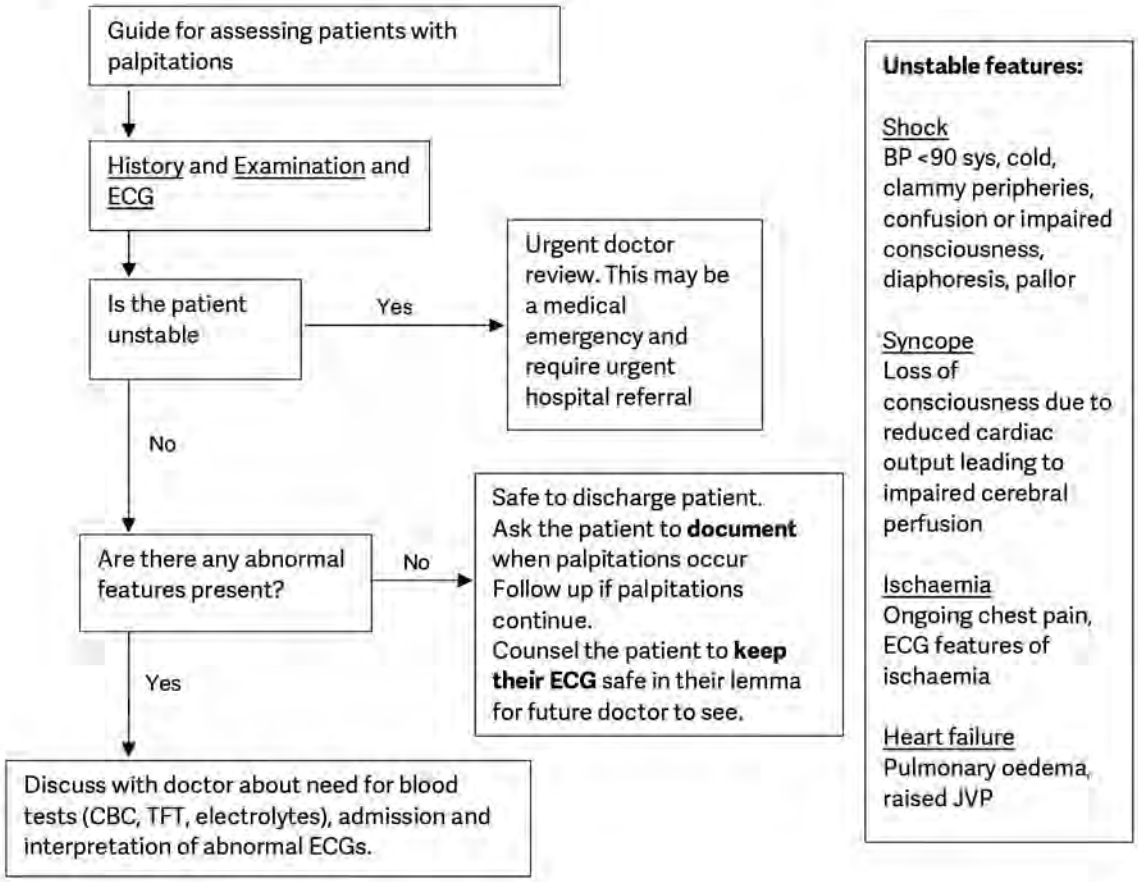
Figure 6.10 ABCDE approach for causes of palpitations

A	Normal
B	Hypoxia Basal crepitations
C	Pulse rate (count pulse for 1 minute) Determine if pulse is fast or normal, regular or irregular Blood pressure Peripheral perfusion (Cool and clammy peripheries, capillary refill time increased) Auscultation for heart murmurs Raised jugular venous pressure (JVP)
D	Cerebral perfusion – new confusion, altered GCS Blood glucose
E	Peripheral oedema Tremor Goitre Anaemia

2. ECG – best way to diagnose heart arrhythmia. ECG can be normal if the patient is not having palpitations or tachycardia during the ECG. Try to repeat the ECG when the patient has palpitations. If the patient is having palpitations and the pulse rate is normal, this means they do NOT have a tachycardia.

3. Investigations
   - CBC: look for anaemia
   - Thyroid function tests: hyperthyroidism and hypothyroidism can cause palpitations
   - Serum electrolytes (sodium, potassium, magnesium)
   - If possible, echocardiogram: especially if heart murmur is heard on examination

Figure 6.11 How to diagnose and manage patients with palpitations*new



Abnormal features

History:
Loss of consciousness, chest pain, have a relative with sudden death, previous heart attack, previous stroke, weight loss

Examination:		ECG:
Heart rate >100 or <60	Heart failure	HR >100 or <60
Irregular heart beat	Goitre	Irregular rhythm
BP <90/60	Tremor	QRS >120ms
Murmur	Anaemia	

If there is an abnormal ECG, refer for further treatment if it is available.

The treatment options below are provided for your information if you are interested.
Most of the treatments are not available at small clinics.
It is best if these cases are discussed with a doctor, if one is available.

TREATMENT

If there is tachycardia causing the palpications, treatment depends on the type of tachycardia diagnosed on ECG (*see Figure 6.12 below*). Treat the underlying cause.

Figure 6.12 Classification of tachy

QRS duration	Regular RR interval	Irregular RR interval
<120 ms (narrow)	1. Sinus tachycardia **A** 2. AVNRT (AV node re-entry tachycardia) 3. AVRT (AV re-entry tachycardia) 4. Atrial flutter with regular AV block and regular rhythm	1. Atrial fibrillation (AF) **B** 2. Atrial flutter with variable AV conduction block
>120 ms (broad)	1. Ventricular tachycardia (VT) **C** 2. Super-ventricular tachycardia with bundle branch block	1. Ventricular fibrillation **D** 2. AF with pre-excitation 3. AF with bundle branch block 4. Polymorphic VT

The letters (A-D) and numbers (1-4) are listed below. *Refer to Figure 6.12*

A. Regular RR interval narrow complex tachycardia, P wave present, QRS <120ms

1. Sinus tachycardia:
   - This is not an arrhythmia.
   - Treat underlying cause (pain, anxiety, shock, sepsis, anaemia, thyroid disorder, etc.)

2-4. Non-sinus narrow complex tachycardias (AVRT, AVNRT, Atrial flutter with AV block and regular rhythm): P wave absent or not matched to QRS, QRS <120ms
   - Start with vagal manoeuvres
     - Try blow into and inflate a syringe or balloon
     - Carotid sinus massage with doctor supervision. DO NOT PERFORM IN CHILDREN
   - If vagal manoeuvres fail give **IV adenosine**, if available
     - **Only do with ECG monitoring and DCCV (Direct current cardioversion) facilities** available because there is risk of causing heart block and death
     - Start with 6mg IV
     - Repeat with 12mg IV if heart rhythm is still tachycardia
   - If adenosine is not available give **metoprolol** PO 50-100mg STAT
     - Repeat metoprolol if there is no effect by 2 hours.
   - If medical management fails discuss about referral for DCCV

B. Irregular narrow complex tachycardia

1-2. Atrial fibrillation or atrial flutter:
   - Treat causes of AF (sepsis, heart failure, electrolyte abnormalities (especially potassium and magnesium)
   - Rate control
     - **Beta-blockers** or **calcium channel blockers**
       - **Metoprolol**: initial dose 50mg, increase to 150mg BID depending BP and heart rate
       - Try to keep heart rate of <110 bpm
     - If have heart failure or hypotension, consider **digoxin**. Digoxin can cause severe side effects so be very careful, especially if there is renal failure
   - There is a risk for blood clots in the heart and patients need life-long anti-coagulation treatment. The risk of anti-coagulation treatment is bleeding. Consider the risk/benefit for the patient.

C. Regular broad complex tachycardia. QRS >120ms

1. Monomorphic Ventricular tachycardia (VT)
    - Refer
2. Supraventricular tachycardia with bundle branch block
    - Follow treatment for regular narrow complex tachycardia
    - **Note**: if not sure of diagnosis, then treat like monomorphic VT and refer

D. Irregular broad complex tachycardia

1. Ventricular fibrillation (VF)
    - VF will cause death
    - Start cardiac arrest management (*see p.13*)
2. AF with pre-excitation
    - There is high risk to become VF
    - Refer
3. AF with bundle branch block
    - Treat as AF (*see above*)
    - **Note**: if not sure of diagnosis then treat like AF with pre-excitation and refer
4. Polymorphic VT (torsades de pointes)
    - Refer

7.1 NORMAL VARIATIONS OF THE OROPHAYRNX*NEW

See Appendix 1 for coloured photos.

7.2 DISEASES OF GUMS AND TEETH

The most common problems are infections in the tooth (dental caries) and inflammation of the gums (gingivitis). Both disorders are the result of lack of daily cleaning of teeth and gums and may eventually cause tooth loss. **Note**: For most dental conditions it is important to seek trained help from a dentist.

DENTAL CARIES

For photo, *see Appendix 1*

DEFINITION
Cavities in the tooth that can be complicated by local infections.

RISK FACTORS
1. Sugar rich diet.
2. Poor teeth strength because of low calcium and/or fluoride.
3. Infrequent or no teeth cleaning.

SIGNS AND SYMPTOMS
- Black colour and tooth erosion
- Usually pain, especially when eating or drinking cold foods

TREATMENT
- In cases of constant pain, look for a specific source (tooth)
- Treat the pain with **paracetamol**
- Treat any swelling with **ibuprofen** and antibiotics (**amoxicillin** and **metronidazole** or **clindamycin**) If swelling is reduced refer to dental team
- If there is no swelling but constant pain, refer to the dental team
- The best treatment is to fill the cavity OR to extract the tooth. Refer to trained dental team

PREVENTION
Clean the teeth and gums daily. Calcium intake and using flouride toothpaste can make teeth stronger. Too much fluoride causes irreversible tooth discolouration, so children should not swallow toothpaste.

New guidelines: patients with heart problems DO NOT need antibiotic prophylaxis when having dental treatment

7.3 GUM DISEASES

For photos, *see Appendix 1*

Gum diseases do not cause much pain, so people may not realise that there is a problem.

a) Gingivitis

DEFINITION: Inflammation of the gums around the teeth. This is the most common oral disease.

SIGNS AND SYMPTOMS: Red and swollen gums, bleeding while brushing, bad mouth smell.

TREATMENT: Daily cleaning of teeth and gums. **Chlorhexidine** 0.2% or salt water mouthwash.

PREVENTION: Daily cleaning of teeth and gums. Removal of calculus (dental plaque) by dental team.

b) Periodontitis

DEFINITION: A bacterial infection of the supporting structures of the teeth.

SIGNS AND SYMPTOMS: Pain, fever, swelling of the gums and/or pus. Mobility of the infected tooth.

TREATMENT: Daily oral hygiene. Oral **amoxicillin** and **metronidazole.** Extract the affected tooth.

PREVENTION: Daily cleaning of teeth and gums Removal of calculus (dental plaque) by dental team.

7.4 STOMATITIS

For photos, *see Appendix 1*

DEFINITION
A disorder of inflammation of the oral mucosa. It usually heals in about 10 days after starting treatment or removing the cause. Discuss with doctor if lesions do not disappear or return within 2 weeks, the patient may need investigation for immunodeficiency e.g. HIV.

SIGNS AND SYMPTOMS
- Pain with difficulty eating because of inflammation or ulcers in the mouth.
- Nausea, vomiting.

CAUSES
1. **Fungal** e.g. candidiasis (oral thrush) white patches on tongue, inside cheek (may spread to pharynx). Common in infants, malnourished children, in diabetes and immunosuppression e.g. HIV, cancer. Also occurs when taking steroid inhaler and the patients do not wash their mouth out after using inhaler.
2. **Viral** e.g. herpes stomatitis
3. **Vitamin Deficiencies** – especially if inflammation of corners of the mouth (angular stomatitis)
4. **Trauma**
5. **Systemic diseases**

TREATMENT
- Maintain feeding and hydration. When necessary use nasogastric tube.
- Treat according to the likely cause of the stomatitis:
  - **Fungal infection**: **Nystatin** 1 lozenge in mouth or 1ml suspension (100,000 IU) QID for 7 days. Oral suspension should be swished around mouth and then swallowed.
  - **Viral infections**: wash the mouth with **warm salt water.** If there is secondary bacterial infection, wash mouth with **chlorhexidine** 0.2% and treat with **amoxicillin**.
  - **Vitamin Deficiencies**: replace deficiencies (*see p.219*).

Note: Viral infections such as primary and secondary herpes should be treated with supportive care only and these are generally self-limiting, with a two week duration. Chlorhexidine and antibiotics do not help in viral infections and may complicate oral thrush.

PREVENTION
If taking corticosteroid inhaler e.g. budesonide advise to wash mouth out (swish water in mouth and spit out – do not swallow) after each use. Educate about good diet.

7.5 LOWER MOUTH AND NECK INFECTIONS*NEW

7.5.1. SUBMANDIBULAR SPACE INFECTION

DEFINITION
Bacterial cellulitis of the area below the tongue (submandibular and submaxillary area). This is also called Ludwig's angina. The infection is located at the floor of the mouth and can spread rapidly. It is bilateral.

SIGNS AND SYMPTOMS
- Fever and chills
- Mouth pain, painful swallowing, muffled voice
- Swelling of the tongue, submandibular area
- NO lympadenopathy
- This can be life threatening if the airway is blocked (drooling, stridor, or cyanosis)

RISK FACTORS
1. Infection of dental caries
2. Trauma to the bottom of the mouth
3. Often patients have other diseases like HBP, diabetes or HIV

TREATMENT
- Refer immediately if the patient has stridor or respiratory distress
- Take CBC and blood cultures before starting antibiotics
- **Start treatment with IV antibiotics** (total antibiotics IV and PO is 2-3 weeks):
  - **Ceftriaxone** PLUS **Metronidazole**. Can use **clindamycin** in penicillin allergic patients

PREVENTION
Maintain good health of the teeth and gums by brushing teeth twice daily with fluoride toothpaste.

7.5.2. PERITONSILLAR ABSCESS

For photos, *see Appendix 1*

DEFINITION
Abscess located along the outside the tonsils. This may look similar to tonsillitis and pharyngitis.

SIGNS AND SYMPTOMS
- Severe sore throat and pain with swallowing
- Muffled voice
- Trismus ('lock jaw')
- Neck swelling and pain, pain in the ear on the same side as the abscess
- This can be life threatening if the airway is blocked (drooling, stridor, or cyanosis)

RISK FACTORS
1. Recent tonsillitis or pharyngitis

TREATMENT
- **Needle aspiration and drainage of the abscess is needed**. If not available, refer the patient to the hospital. If there is no respiratory distress, start antibiotics to see if there is improvement (especially if the diagnosis is cellulitis and not abscess).
- If severe, treat with **IV ampicillin** or **IV clindamycin**.
- If moderate, treat with oral **amoxicillin/clavulanate** or **clindamycin**.

7.5.3. RETROPHARYNGEAL ABSCESS

DEFINITION
Abscess located posterior to the pharynx. It can occur between the base of the skull to the mediastinum. You cannot see retropharyngeal abascess on physical examination.

SIGNS AND SYMPTOMS
- Fever
- Muffled voice
- Pain and/or difficulty with swallowing
- Neck stiffness, swelling, mass or lymphadenopathy
- This can be life threatening if the airway is blocked (drooling, stridor, or cyanosis)

DIAGNOSIS
- You may see swelling of the posterior pharyngeal wall (in the back of the throat and behind the tonsils), but this is probably not enough to make the diagnosis. If the abscess ruptures, the pus may enter the upper airway so do not palpate the area strongly.
- Diagnosis is made by X-ray of the lateral neck. Discuss with the doctor. (The space in front of the vertebra at C6 should be ≤ 14mm in children or ≤ 22mm in adults).

RISK FACTORS
1. More common from age 2-4 years but can occur at any age, including neonates.

TREATMENT
- Refer immediately if the patient has stridor or respiratory distress.
- Consider referral for surgical drainage if the abscess is large (≤ 2.5cm^2, symptoms >2 days, or the patient is unstable. If there is no airway obstruction, you can try IV antibiotics first.
- Take CBC and blood culture before starting antibiotics. If available, check a throat culture.
- If severe, treat with IV ampicillin or IV clindamycin.
- If moderate, treat with oral **amoxicillin/clavulanate** or **clindamycin**.

7.5.4. LYMPHADENITIS

DEFINITION
- Infection of the lymph nodes around the ears or neck region. Lymphadenitis may be caused by many things. It is important to take a good history.

SIGNS AND SYMPTOMS
- Warm, red or painful lymph nodes. They can be unilateral or bilateral. If the lymph nodes are very large (>1cm) look for other bacterial causes.
- Fever
- Look for skin lesions and dental health. This may help to find the cause of lymphadenitis.

CAUSES OF LYMPHADENITIS (OR LYMPADENOPATHY)

- Bacterial: The most common cause is *Staphylococcus aureus*. Other common bacteria cause lymphadenitis are mycobacteria (TB), *Group A streptococcus* (like strep throat), or *Bartonella henselae* (cat scratch disease)
- Viral: Epstein-Barr virus (EBV), Herpes simplex virus
- Other: non-painful lymphadenopathy can be caused by cancer (lymphoma)

DIAGNOSIS

- This is a clinical diagnosis. Ultrasound can help to see if the lymph node contains fluid.
- Ask about vaccination status, ill contacts (e.g. viral infections or tuberculosis), exposure to animals. This can help find the cause of lymphadenitis and what antibiotic to use.

TREATMENT

- In mild cases, no bloodwork is needed.
- If unwell, take a CBC, CRP, and blood culture. Consider checking the patient for tuberculosis.
- Treat with **cloxacillin** (oral or IV). **Clindamycin** is an alternative treatment in severe cases or if a patient has a penicillin allergy.
- If there is no response to the above treatment, discuss with a doctor for advice on management.

7.6 PAROTITIS

See Causes and treatment of parotitis, p.177.

7.7 TRAUMA

7.7.1. TOOTH TRAUMA

DEFINITION

If a permanent tooth is knocked out it should be pushed back into the socket as quickly as possible. Do not replace children's milk (primary) teeth that have been knocked out.

TREATMENT

- Treat the pain with **paracetamol**.
- Put the permanent tooth back in the right place. Be sure the patient can close his mouth in normal position. Counsel the patient to only eat soft food for 2 weeks.

7.7.2. TRAUMA TO THE ORAL MUCOSA

DEFINITION

Laceration of the oral mucosa or tongue

DIAGNOSIS

- Check for trauma to the teeth, base of the teeth (skull fracture), and facial or orbital bones.
- You should also look for foreign bodies.

TREATMENT

- If there is both tooth trauma and laceration, first treat the laceration. After the laceration is treated, then treat the tooth trauma.
- The oral mucosa is very vascular (a lot of blood flow) so any laceration of the tongue or oral mucosa will bleed a lot. This can cause respiratory distress or blocked airway. Refer immediately if there is respiratory distress or stridor or bleeding cannot be controlled.
- The mouth has salivary glands, parotid duct and other ducts. If there is clear fluid leaking in the mouth, there may be injury to the glands or ducts. If possible, refer immediately to a hospital. If possible, refer to a hospital where there is a specialist for mouth injuries.
- **Most oral lacerations DO NOT need to be sutured**. They will heal well because of the high blood flow in the mouth.
- **Indications for suture**: lacerations > 2cm, presence of a flap of tissue that does not stay flat, or if food can become stuck inside the wound.
- Use absorbable suture for wound repair.
- To reduce inflammation after repair, the patient can put ice in the mouth. **Eat soft food until the wound is healed.**
- **After each meal and before bedtime, rinse the mouth with water.**
- Follow closely for signs of infection. The saliva and gums have a lot of bacteria.

8.1 OTITIS

DEFINITION
Otitis is an infection of the ear. There are three areas of the ear that can be affected:
1. Otitis Externa (outer ear)
2. Otitis Media (middle ear)
3. Labyrinthitis (inner ear) – usually viral and causes vertigo (not reviewed in this medical guideline)

Babies and small children cannot explain that they have ear pain. Check the ears every time they have fever, vomiting, crying, agitation or diarrhoea.

8.1.1. OTITIS EXTERNA

For photo, *see Appendix 1*

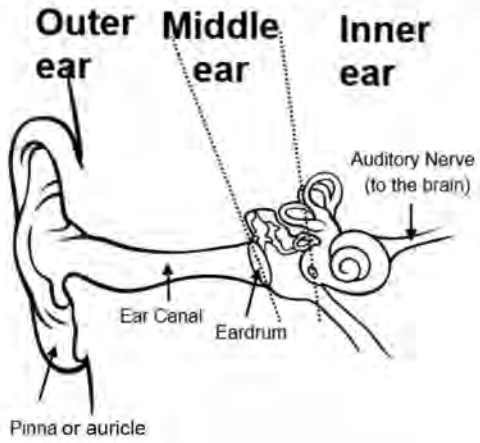
DEFINITION
Skin infection of the ear canal (the outer ear).

CAUSES
- Often no cause
- Trauma to ear canal
- Foreign body
- Skin disease e.g. eczema

SYMPTOMS
- Pain or itching of ear
- Ear feels full or hearing loss
- May have discharge that is clear or pus

SIGNS
- Ear canal is red, swollen
- Ear drum looks normal
- Sometimes fungus in the external ear canal
- Look for foreign body

Figure 8.1 Anatomy of the ear



TREATMENT
1. If can see the ear drum well and there is **no perforation**: clean the ears with **sterile water or NSS**, especially when there is pus or fluid.
2. If cannot see the ear drum well: **Dry mop the ear.**
   - Educate the mother that is important to dry the ear.
   - Use a clean, absorbing cotton cloth or soft strong tissue paper for making a wick. Do **NOT** use a cotton-tipped applicator, a stick or paper because little pieces can fall in the ear and make the infection worse.
   - Place the wick in the child's ear until the wick is wet.
   - Replace the wet wick with a clean dry one.
   - Repeat these steps until the wick stays dry. Then the ear is dry.
   - Repeat this process 3 times per day; continue until the ear is dry.

Figure 8.2 How to make a wick for drying ears

3. Explain need to avoid getting the ear wet e.g. no swimming, be careful when washing.
4. If a foreign body is present, do not push it with cotton, but clean gently with oil until it comes out (sometimes this will need to be repeated for 2-3 days).
5. Apply **cadexin** or other topical antibiotic drop with a cotton bud. Some ear drops, like cadexin, have steroids to decrease swelling. If not available, you can use **prednisolone** 20mg PO stat dose to decrease severe swelling.
6. Repeat this local treatment every day until cured (usually 3 to 5 days).
7. Treat the fever and the pain with **paracetamol**.
8. If no improvement after 5 days, give PO **cloxacillin**.
9. If it is difficult to clean the ear (especially with severe fungal infection) consider referral to an ENT specialist.

8.1.2. LOCALISED OTITIS EXTERNA*NEW

DEFINITION
A boil, furuncle or abscess at the entrance of the ear canal.

CAUSES
Infection of a hair follicle, gland or sebaceous cyst, most often from *Staphylococcus aureus*

SIGNS AND SYMPTOMS
- Pain
- Localised swelling or abscess
- Redness of the external canal
- Pus from the ear can cause otitis externa

TREATMENT
1. Apply antiseptic ointment daily (gentian violet or povidone).
2. Incision and drainage of abscess.
3. If the infection is severe, give cloxacillin PO or IV depending on the severity of infection.
4. Use parcetamol or ibuprofen for pain control.
5. Counsel the patient not to pick the ears with pins, toothpicks or fingernails. Avoid getting water into the ear.

8.1.3. ACUTE OTITIS MEDIA

For photo, *see Appendix 1*

DEFINITION
Acute bacterial or viral infection of the middle ear (behind the ear drum). Not common in adults.

SIGNS AND SYMPTOMS
- Rapid onset of severe pain (mostly at night), fever, ear discharge
- Ear drum: red, bulging (swollen), may be perforated with pus discharge
- Red ear drum without bulging or perforation = viral otitis if have URTI symptoms e.g. sore throat or runny nose
- Air bubbles and intact ear drum without signs of acute infection = otitis media with effusion

TREATMENT
- Treat the fever and pain with **paracetamol**.
- **Note**: Do not clean the ear with NSS if the ear drum is perforated or the ear drum cannot easily be seen and cannot confirm if normal. The NSS may enter the middle ear if the ear drum is perforated.

Antibiotics:
- Most cases of acute otitis media are caused by viruses so not everyone needs antibiotics.
- **Do not give antibiotics on first presentation*** if NO RISK FACTORS. Often, symptoms improve without treatment. If possible, re-examine the ear in 48-72 hours before decide to give antibiotics.

Give antibiotics to all with RISK FACTORS:
  - Children <2 yrs
  - Severe infection e.g. vomiting, fever >39°C, severe pain
  - Special circumstances e.g. malnutrition, ear malformation, immunodeficiency e.g. HIV
- If antibiotics not given initially, re-assess at 48-72 hours, prescribe antibiotics if no improvement or worsening of symptoms.
  - 1st Line: **Amoxicillin**, use dose for severe infection (Adult: 1gm TID, Child: 80-100mg/kg/day divided BID)
  - Treat for 5 days, continue for longer if severe infection or not better.
  - If not better in 72 hours (3 days) and the fever and/or ear pain is continuing, then switch to **co-amoxiclav**
  - If allergy to amoxicillin, treat with **erythromycin** or **doxycycline**
- It will take 4 weeks for the ear drum to look normal on physical examination.
- Parents of children with otitis media should stop smoking.

COMPLICATIONS
Same as for acute mastoiditis (*see next page*)

8.1.4. ACUTE MASTOIDITIS*NEW

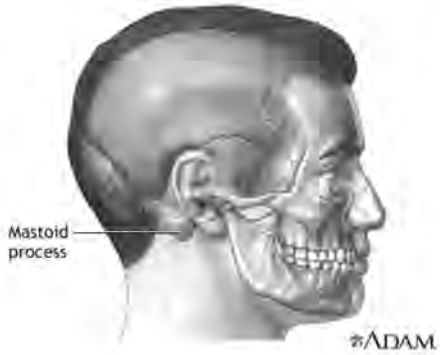
For photo, see Appendix 1

DEFINITION
Necrosis and infection of the air cells in the mastoid bone.

CAUSES
An acute mastoiditis can develop after persistent or inadequate treatment of acute otitis media, if there is low immunity or if the bacteria is very virulent (strong and spreads easily in the body). The most common bacteria in children are *S. pneumoniae*, *S. pyogenes*, and *S. aureus*. In adults the most common bacteria are *Pseudomonas aeruginosa* and *S. aureus*. When hygiene is poor, *E. coli*, *K. pneumoniae*, *Proteus* species.

SIGNS AND SYMPTOMS
- No improving fever or pain when on otitis media treatment
- Pain, especially at mastoid area, infants maybe only irritable
- Redness or swelling
- Otitis media on ear examination
- Swelling of the ear canal in front of the tympanic membrane
- Sometimes patients have no symptoms

Figure 8.3 Anatomy of the mastoid bone



TREATMENT
- Antibiotics:
  - **Ciprofloxacin** 500mg BID or Ceftriaxone 1gm IV daily (high dose for severe infection)
    OR
  - **Benzylpenicillin** (50,000 units/kg IV QID) and **Chloramphenicol** (25 mg/kg IV or IM QID)
  - If no improvement or you suspect *P. aeruginosa*, discuss with doctor for different antibiotic
- Refer to hospital if possible. An ear nose throat (ENT) doctor should perform a mastoidectomy.
- If referral is not possible, perform an incision and drainage of the abscess. If needed, change antibiotics after you have the pus culture and sensitivity results.

COMPLICATIONS
- Osteomyelitis
- Facial nerve palsy
- Labyrinthitis
- Hearing loss
- Meningitis
- Brain abscess
- Venous sinus thrombosis (blood clots in brain blood vessels)

8.1.5. CHRONIC OTITIS MEDIA

For photo, see Appendix 1

DEFINITION
Chronic suppurative otitis media is chronic discharge from middle ear with ear drum perforation.

SIGNS AND SYMPTOMS
- Pus discharge for more than 2 weeks
- Often associated hearing loss or deafness
- No fever, no pain
- Perforated ear drum with pus discharge

TREATMENT
- If fever and pain: treat for acute otitis media

If no fever or pain, oral antibiotics are NOT the best treatment for chronic suppurative otitis media.
The best treatment is to dry mop and clean the ear (with or without antibiotic ear drops)

- **Dry mop** the ear (*see Figure 8.3 above*).
- **Do not send ear swab** for culture, because it will be contaminated with many bacteria.
- Apply antibiotic drops (this may not be needed).
- **Ciprofloxacin**
    - Child: 2 drops BID until no more pus/discharge usually 2-4 wks
    - Adult: 4 drops BID for 2-4 wks
- If no other options consider: **chloramphenicol** (2-3 drops 2-3 times per day).
- Apply drops after cleaning ear.
- After applying drops get the patient to lie on their side with infected ear upwards, press down on the tragus of the ear (bit of ear at front of ear canal) several times.
- If ear drops are not available, use **amoxicillin** oral for 2 weeks.

Cadexcin (dexamethasone and neomycin) is another option – it can cause **ototoxicity (deafness)**.
Do not use more than 2 weeks.
Discuss with doctor before using, may need to try oral antibiotics before giving cadexcin.

COMPLICATIONS
- Mastoiditis
- Other complications same as for mastoiditis (see previous page). **Note**: Think of tuberculosis if the symptoms are chronic and do not respond to treatment.

PREVENTION
Early treatment of acute ear infections may decrease the risk of chronic otitis media and mastoiditis. Parents of children with otitis media should stop smoking.

8.1.6. CHOLESTEATOMA*NEW

DEFINITION
A mass made of epithelial cells in the middle ear or mastoid. The epithelial cells come from the external canal.

RISK FACTORS
1. Eustachian tube dysfunction (tympanic membrane is retracted)
2. Recurrent otitis media
3. Tympanic membrane perforation and chronic suppurative otitis media
4. Downs syndrome (often have eustachian tube dysfunction)
5. Cleft palate

SIGNS AND SYMPTOMS
- White mass behind tympanic membrane which can grow for many years, can grow into the bone
- Some patients have no symptoms
- Hearing loss (especially if unilateral/one side or in children)
- Pus from ear >2 weeks after appropriate treatment

TREATMENT
- The main treatment is surgical, so these patients need referral to an ENT specialist if possible.
- Antibiotics if infection suspected. Discuss antibiotic choice with doctor.

COMPLICATIONS
- Infection of the cholesteatoma (*S. aureus, P. aeruginosa, Proteus species, Bacteroides*, TB)
- Hearing loss
- Cranial nerve palsy (Abducens and Facial nerves)
- Brain abscess
- Meningitis

8.1.7. AURICLE AND PINNA PROBLEMS*NEW

Leprosy can cause painless nodules on the auricle. (*see p.270*)

CELLULITIS (ALSO CALLED PERICHONDRITIS)

DEFINITION
Infection of the auricle (*see Figure 8.1*) caused by skin flora and sometimes *Pseudomonas*. The auricle is mostly cartilage so there is not much blood flow to the area. This can slow down the healing process.

SIGNS AND SYMPTOMS
- Warm
- Red
- Swelling
- Pain

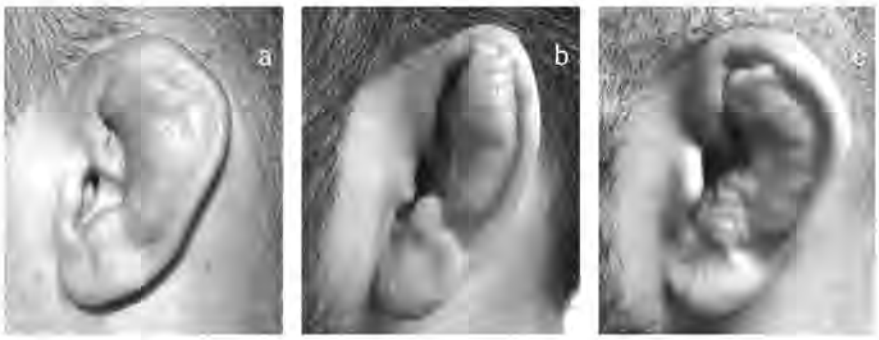
TREATMENT
- **Cloxacillin** PO x 7 days. There is a risk for treatment failure because of the low blood flow to the cartilage. Follow up daily until there is improvement.
- If symptoms are moderate to severe or if there is no improvement, start cloxacillin IV.
- If not improving, consider adding antibiotics that treats pseudomonas (e.g. **ciprofloxacin**).

TRAUMA TO THE AURICLE

DEFINITION
Haematoma or laceration of the auricle. Chronic trauma to the ear can cause chronic haematoma which becomes a painless 'cauliflower ear'.

SIGNS AND SYMPTOMS

Figure 8.4 Haematoma of the auricle



(a)
Acute haematoma

(b)
Without treatment, the haematoma becomes chronic, and

(c)
may develop into 'cauliflower ear'

TREATMENT
1. Lacerations:
    a. Clean well.
    b. Suture using a small sized suture and needle (e.g. 5.0 or 6.0).
    c. Do not use anaesthetics that contain adrenaline (epinephrine). This can cause decreased blood flow from vasoconstriction and necrosis of the auricle.
    d. REMEMBER to consider **tetanus vaccination**. If the wound is contaminated you may need prophylactic antibiotics or close follow up without antibiotics. For bites, think of antibiotics and additional investigations (e.g. Hepatitis B, HIV). Consider **rabies vaccine** especially for bites on the head (*see p.175*).
2. Hematoma
    a. If <2cm and <48 hours from time of trauma, do needle aspiration.
    b. Can refer if the hematoma is >2cm or >48 hours from time of trauma. If possible, you can do incision and drainage. If there is still bleeding, put an 18 gauge catheter inside to drain the hematoma. Remove the catheter when the bleeding has stopped.
    c. If trauma was >7 days ago, only observe the patient. They may develop 'cauliflower ear'.

DEFINITION

Electrolytes are carefully controlled in our bodies. Levels too high or too low are dangerous. This can be from chronic disease (e.g. hyperkalaemia from kidney failure) or from medication (e.g. hypokalaemia from furosemide). Abnormal electrolytes can be an emergency. HYPO = too low HYPER = too high

Suspect electrolyte problem if:	Investigations
• Dehydration	CBC
• Sepsis	Creatinine - used to calculate the glomerular filtration rate (GFR) for kidney function
• Shock	BUN – used for hydration status of the patient
	Na+ (sodium), K+ (potassium), Mg+ (magnesium), PO4 (phosphorus), Ca++ (calcium), albumin
	ECG (if available)
	Follow fluid balance

Note: Reference ranges in children may be different from adults.

9.1 POTASSIUM

Potassium is important for the heart and other muscles to work. The reference range is 3.5-5.1mmol/L.
Note: For potassium, mmol/L is the same as mEq/L. A conversion formula is not needed.

9.1.1. HYPERKALAEMIA

High potassium can cause abnormal rhythms in the heart and death. Do ECG if available.
>6.5mmol/L is an emergency or >6 mmol/L with changes on the ECG

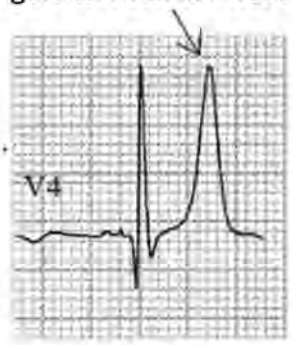
DEFINITION

High potassium is >5.1mmol/L

CAUSES

1. Renal Failure
2. Medications e.g. ACE-inhibitor (e.g. enalapril), spironolactone, NSAID's
3. Endocrine diseases e.g. Addison's disease (adrenal gland failure with low cortisol)
4. Haemolysis (breakdown of red blood cells that release potassium)
5. Burns, heat stroke, rhabdomyolysis (break down of muscles)
6. Metabolic acidosis e.g. severe shock
7. Pseudohyperkalaemia (if red blood cells break down when taking blood then the level of potassium can be falsely high)

Figure 9.1 Peaked T wave



"Peaked" T wave

SIGNS AND SYMPTOMS

- Asymptomatic, sometimes non-specific tiredness, muscle weakness
- Abnormal heart rhythm – may cause tachycardia, palpitations, chest pain
  - If abnormal rhythm is severe may cause death
- ECG can show peaked T waves

TREATMENT

- Stop any medications that may cause hyperkalemia. Treat the underlying cause.
- If kidney function is normal and no other cause, repeat the potassium. It may be falsely high from RBC breakdown when taking blood.
- If potassium >6.5 or >6 with ECG changes, there is a high risk of sudden death. If available, try the treatments below and refer immediately.
  - **Calcium Gluconate 10%** 10ml SLOW IV over at least 10 minutes (this protects the heart)
  - **Salbutamol** nebuliser 5mg (this helps to lower the potassium)
  - **Insulin** (this helps to lower the potassium). 10 IU of insulin should be added to 125 cc of glucose 20% infusion fluid. This should be given in 30 minutes which will decrease the potassium 1 mmol/hour. This effect starts after 10-20 minutes after infusion and will last approximately 4-6 hours. **BE CAREFUL** this can cause hypoglycaemia and you must check the dextrose every hour.

9.1.2. HYPOKALAEMIA

DEFINITION
Low potassium is <3.5 mmol/L

CAUSES
1. Medications e.g. furosemide, hydrochlorothiazide, insulin
2. Gastrointestinal loss e.g. diarrhoea (also vomiting)
3. Metabolic alkalosis
4. Low intake in diet e.g. malnutrition
5. Endocrine diseases e.g. Conn's syndrome (too much aldosterone production)
6. Low magnesium (can be caused by penicillin)

SIGNS AND SYMPTOMS
- Usually asymptomatic
- Severe hypokalaemia will cause muscle weakness, myalgia, muscle cramps and constipation
- Paralysis can occur
- If severe can cause death

TREATMENT
- Stop any medications that may be causing the problem. Treat the underlying cause.
- Encourage patient to eat bananas, tomatoes, leafy green vegetables, coconut water, lemons, limes, oranges.
- Potassium can be replaced by tablets (swallow tablets whole during meals with lots of fluid) or IV depending on level of potassium:

Mild Hypokalaemia	**3.0-3.4 mmol/L**	PO **one tablet* BID for 1 week** and re-check potassium
Moderate hypokalaemia	**2.5-3.0 mmol/L**	PO **two tablets* TID for 3 days** and re-check potassium If not increasing, give **magnesium** and try two tablets QID and consider admission for IV potassium
Severe hypokalaemia	**<2.5 mmol/L**	****Note:** IV replacement can be dangerous and should be done with cardiac monitoring. Refer patient immediately if possible** ****All the potassium IV replacement is to be supervised/instructed by the doctor. Use a pulse oximeter to monitor the pulse during the IV infusion**** *See Figure 9.2* for IV potassium treatment

*Dose for Slow K (600mg tablet = 8mmol or mEq potassium)

Figure 9.2 IV Potassium treatment and warning*update

IV POTASSIUM SHOULD ONLY BE DONE AFTER CAREFUL CONSIDERATION BY THE DOCTOR AND MEDICAL TEAM

IV potassium for adults
- Put **40mmol potassium chloride** (KCl) (3 x 1.34mmol/ml 10ml Ampoules) in 1 litre 0.9% NSS (or 1.5 KCl ampoules in 500ml NSS) and mix bag well.
- Maximum rate is 250ml per hour (10mmol K+ per hour).
- If magnesium is low or unknown, add 1g IV **magnesium** for each 500ml NSS (Magnesium and KCl can be added to same bag NSS).
- If possible use paediatric metroset or burette so do not accidentally give faster than 10mmol/ hour.
- **IV potassium given too quickly can cause cardiac arrest and the heart to stop.**
- IV potassium should only be done with close and excellent medical supervision (even continuous ECG monitoring).
- Maximum rate = 10mmol/hour and maximum concentration for peripheral IV is 40mmol/litre (to prevent cardiac arrhythmias and minimise phlebitis (inflammation of the vein).

If cannot correct the potassium, then the magnesium may be low.
Try to increase the magnesium first before the potassium can be corrected

9.2 CALCIUM

Calcium is important for muscles to work. The reference range is 2.15-2.55mmo/L. If serum albumin is low, the calcium level may not be accurate. You must correct with this formula: Corrected calcium (mg/dL) = serum total Ca (mg/dL) + 0.025 (4.0 - serum albumin [g/dL]); the 4.0 represents the average albumin level.

Conversion formula for mg/dL and mmol/L (calcium)
mmol/L = mg/dL * 0.2495
mg/dL = mmol/L ÷ 0.2495

9.2.1. HYPERCALCAEMIA

DEFINITION
High calcium is a calcium >2.55mmol/L or 10.5mg/dL. If albumin level is low, need to correct the calcium.

Mild Hypercalcaemia	10.5-11.9mg/dL (2.6-2.9mmol/L)
Moderate Hypercalcaemia	12-13.9mg/dL (3-3.5mmol/L)
Severe/Crisis	>14mg/dL (>3.6mmol/L)

CAUSES
- Medications e.g. hydrochlorothiazide
- Renal failure
- Tuberculosis
- Cancers e.g. bone, lung
- Endocrine disorder e.g. hyperparathyroidism

SIGNS AND SYMPTOMS
'Stones, Bones, Abdominal Moans and Psychic Groans'
- **Stones** – kidney stones or gallstones
- **Bones** – bone pain
- **Abdominal moans** – constipation, nausea and vomiting, abdominal pain
- **Psychic groans** – depression, confusion

TREATMENT
- Stop any medications that may cause hypercalcemia. Treat the underlying cause.
- *__IMPORTANT__* rehydrate with **NSS 0.9% bolus** until urine output >20cc/hour) – watch for fluid overload if there is renal failure.
- Diuretics e.g. **furosemide** can help decrease the calcium – do NOT give if the patient is dehydrated.
- Other medications e.g. bisphosphonates can be used but may not be available.

9.2.2. HYPOCALCAEMIA

DEFINITION
Low calcium is a calcium of <2.15mmol/L or 8.6mg/dL. If albumin level is low, need to correct the calcium.

CAUSES
- Low oral intake of calcium
- Medications/toxins e.g. diuretics, gentamicin, alcohol
- Low vitamin D (or not enough sun exposure e.g rickets), hypoparathyroidism
- Sepsis
- Other electrolyte disturbances: High phosphate, low magnesium

SIGNS AND SYMPTOMS
- Tingling around the mouth and lips and in the hands and feet
- Tetany (strong contractions of the hands and large muscles)
- Positive Chovstek (muscle spasm when tapping the facial nerve just before the ear) and Trousseau (arm cramps when getting the BP)

TREATMENT

- Stop any medications that may be causing the problem. Treat the underlying cause.
- Increase dairy products e.g. milk, yogurt
- Calcium PO replacement
    - Calcium carbonate (Calcium carbonate 500 mg/1000 mg tablets) OR
    - Calcium carbonate combined with Vit D3 (Calcium carbonate 500mg +Vit D3 200IU)
- If severe low calcium (<1.9mmol/l) OR patient has symptoms, discuss with doctor
    - Calcium Gluconate 10% 10ml SLOW IV over 10 minutes – repeat until symptoms stop

9.3 SODIUM

Sodium is important for maintaining fluid balance in the body. The reference range is 136-145mmol/L.
Note: For sodium, mmol/L is the same as mEq/L. A conversion formula is not needed.

9.3.1. HYPERNATRAEMIA

DEFINITION
High sodium is >145mmo/L

CAUSES

- Dehydration
- Endocrine disorder e.g. diabetes insipidus (problem with controlling water balance in the body)
- *See Figure 9.3* for differential diagnosis of hypernatraemia

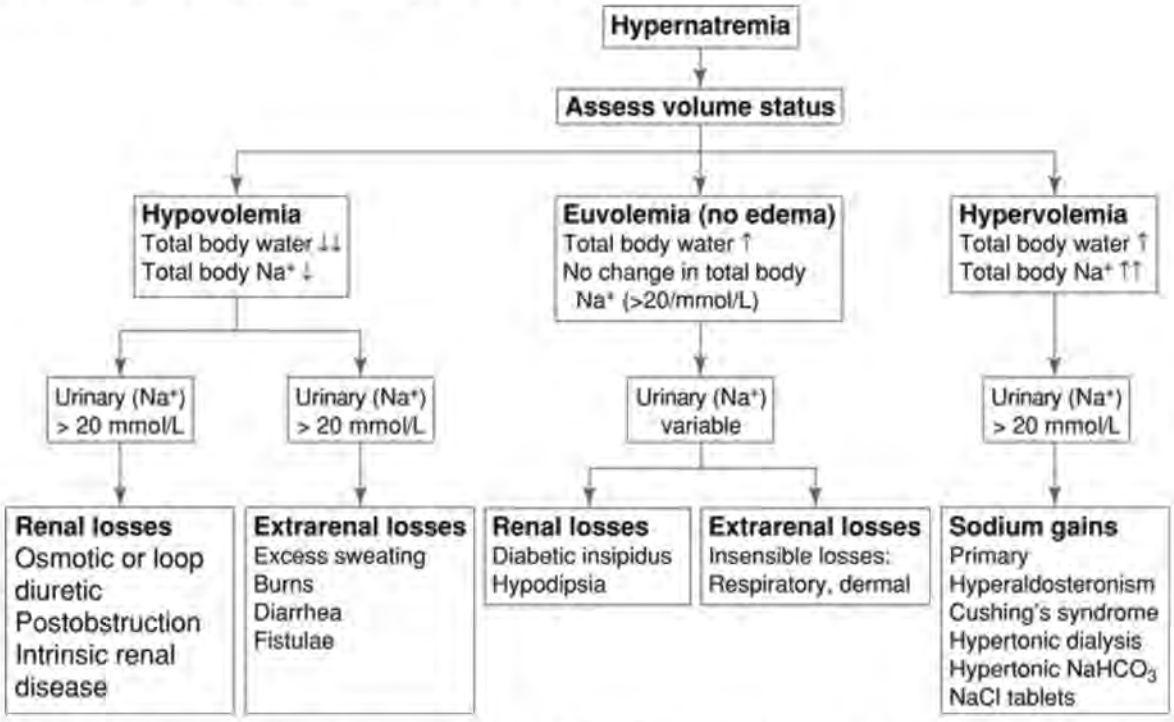
SIGNS AND SYMPTOMS

- Lethargy, weakness, irritable
- Oedema
- Seizures, coma

TREATMENT

- Treatment depends on the cause. Discuss with doctor
- *See Figure 9.4, next page* for hypernatraemia treatment

Figure 9.3 Differential diagnosis for hypernatraemia



Lerma IV, Berns JS, Nissenson AR. CURRENT Diagnosis and Treatment: Nephrology and Hypertension, The McGraw-Hill Companies, Inc.

Figure 9.4 Treatment for hypernatraemia and warning*update

TREATMENT FOR HYPERNATRAEMIA SHOULD ONLY BE DONE AFTER CAREFUL CONSIDERATION BY THE DOCTOR AND MEDICAL TEAM

Correction should be based on how fast the hypernatremia developed:

- Acute (<48 hours): 1-2 mmol/l/hour until symptoms disappear or until the daily limit of 8mmol/l/day
- Chronic: upper limit of correction speed is 8 mmol/l/day
- Best way to correct is to let the patient drink water or give by NGT. If IV D5W must be used, monitor for hyperglycaemia.

If serum sodium level is available, calculate the water deficiency using an online tool or use the equations below:

- Total Body Water (TBW): [0.6 (male) or 0.5 (female)] x weight
- Water deficiency = TBW x ([serum Na]/140-1)
- Give the amount of water calculated for water deficiency

It is very important to correct the sodium to normal very slowly. A rapid decrease in the sodium can cause brain damage

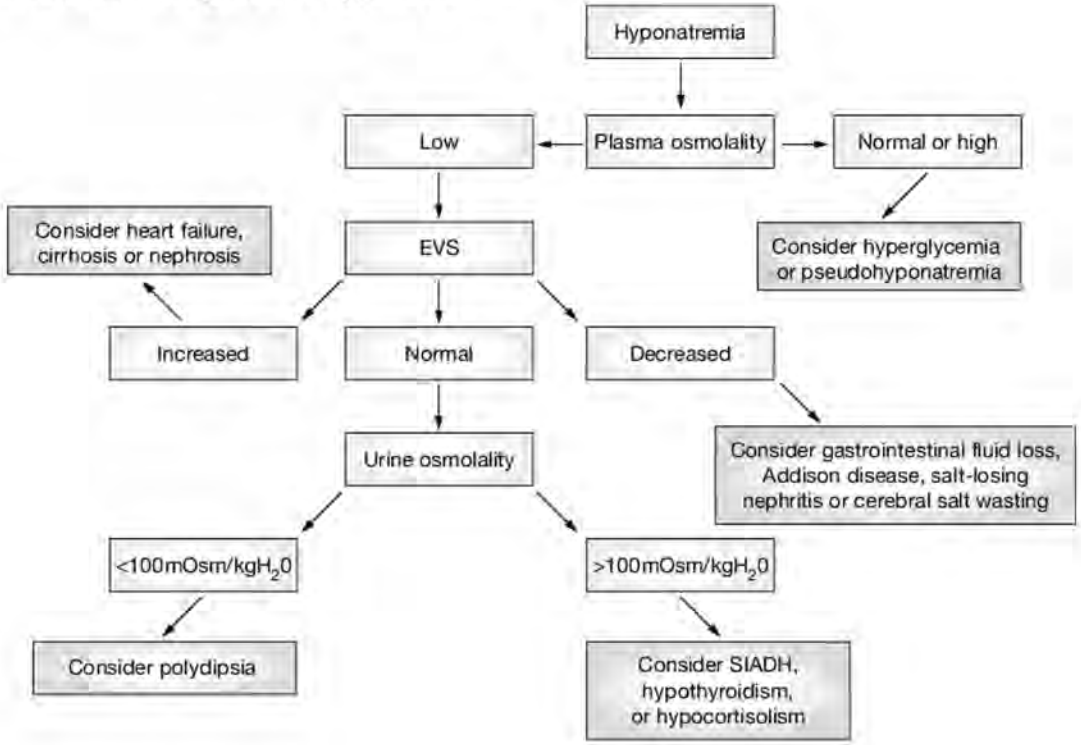
9.3.2. HYPONATRAEMA

DEFINITION
Low sodium is <136mmol/L.

CAUSES

- Fluid overload e.g. heart failure, ascites
- Medications e.g. furosemide, ACE inhibitors
- Endocrine problems e.g. SIADH, hypothyroidism
- Tuberculosis
- Prolonged vomiting & diarrhoea
- Drinking too much water (psychogenic polydipsia)

Figure 9.5 Differential diagnosis for hyponatraemia



For urine osmolality you can use the specific gravity (SG) on the urine stick.
An SG < 1005 g/ml is equal to osmol <300.

SIGNS AND SYMPTOMS

- If not severe can be asymptomatic
- Nausea, vomiting, headache, loss of appetite
- Lethargy, confusion, memory loss
- Convulsions, coma

TREATMENT

- Stop any medications that may be causing the problem. Treat the underlying cause.
- Discuss with doctor.

Figure 9.6 Hyponatraemia treatment and warning*update

TREATMENT FOR HYPONATRAEMIA SHOULD ONLY BE DONE AFTER CAREFUL CONSIDERATION BY THE DOCTOR AND MEDICAL TEAM INVOLVED

Treatment depends on the cause and includes:

- Fluid restriction and/or
- Sodium replacement

Sodium levels should not increase more than 8-9mmol/L per 24 hr or 1mmol/L per 1 hr.

It is very important to correct the sodium to normal very slowly.
A rapid increase in the sodium can cause brain damage.

10.1 DIABETES MELLITUS

DEFINITION

Diabetes Mellitus is a syndrome caused by lack of insulin from the pancreas or reduced effectiveness of insulin in the body. This causes high blood sugar levels (hyperglycaemia).

There are two types of diabetes: **Type 1** (about 10% of cases) usually starts in childhood and can only be treated with insulin (oral tablets do not work).
Type 2 usually starts when older (>30 years), with risk factors, oral treatment usually enough. If severe, may need insulin treatment.

Risk Factors associated with type 2 Diabetes are: positive family history, BMI> 23 and obesity (*see p.217*), history of diabetes in pregnancy, history of malnutrition or low birth weight in the first year of life.

SIGNS AND SYMPTOMS

- Increased thirst
- Increased urine output
- Tiredness
- Weight loss
- Increased infections: especially skin infections, UTIs, vaginal infections (candidiasis) and TB
- Symptoms of diabetic complications

Figure 10.1 Signs and symptoms of diabetes

DIAGNOSIS

If someone has the above symptoms, you should check dextrose and urine dipstick for glucosuria.
To confirm the diagnosis, check glucose level in the venous blood.

Figure 10.2 How to diagnose diabetes in non-pregnant persons or > 4 weeks postpartum

TEST		PATIENT HAS DIABETES IF:
RANDOM BLOOD GLUCOSE	Check Glucose level at any time of the day. It is NOT important if the patient has eaten or not.	**≥ 200mg/dL** (≥ 11.1mmol / L*)
FASTING BLOOD GLUCOSE	Check Glucose level in the morning: advise patient not to eat food or sugary drink in last 8 hours (can have water).	**≤ 126mg/dL** (≥ 7mmol / L)
ORAL GLUCOSE TOLERANCE TEST	Check glucose 2 hours after drinking 75g of glucose	**≥ 200mg/dL** (≥ 11.1mmol/l)

*Conversion formula for glucose: mmol/L = mg/dL ÷18, mg/dL = mmol/L * 18 (*see p.25*)

INVESTIGATIONS (IF AVAILABLE)

- Fasting blood glucose
- Oral glucose tolerance test (usually only for pregnant women)
- Urine dipstick – protein, glucose
- Biochemistry – BUN, Creatinine
- Examine for foot pulses and sensation

COMPLICATIONS

EMERGENCY COMPLICATIONS:
A diabetic patient can present unwell or in coma because the blood sugar is **too high** or **too low**.
****Remember that patients may present as an emergency without history of diabetes****

HYPOGLYCAEMIA <70mg/dL (3.8mmol/l), **<45mg/dL**(2.5mmol/l) **is severe** (*see p.73*)

SIGNS AND SYMPTOMS
Sweating, hunger, tremor, dizziness, drowsiness, aggressive/irritable, confusion, convulsion, coma

TREATMENT

- If dextrose 45-70mg/dL:
  - Give oral sugar solution (water with sugar) or sweet drink to prevent severe hypoglycaemia.
- If dextrose <45mg/d
  - If able to drink give oral sugar solution (water mixed with sugar) or sweet drink
  - **If unable to drink e.g. in coma**: insert IV cannula and give Adult/Child: **5ml/kg 10% dextrose** bolus, Neonate 2ml/kg 10% dextrose
- After giving oral/IV dextrose **re-check blood dextrose after 15 minutes** to make sure it is >70mg/dL

HYPERGLYCEMIA

There are two conditions that occur if the dextrose is high. Both conditions are emergencies:

DIABETIC KETOACIDOSIS (DKA)

DEFINITION

An emergency complication that **occurs in type 1 diabetes** (rarely in type 2 diabetes). It can be caused by infection, not enough insulin, or other illnesses that put a stress on the body. DKA can be life-threatening.

SIGNS AND SYMPTOMS

- Nausea, vomiting, fruity smell on breath from ketones, dyspnoea, abdominal pain, confusion, coma, death

DIAGNOSIS

To diagnose DKA there must be:

1. **Hyperglycaemia: blood dextrose >200mg/dL** (>11.1mmol/L)
2. **Ketones** on urine dipstick
3. **Metabolic acidosis** (bicarbonate <15) (if available).

TREATMENT

- Give **NSS**:
  - Adult 1L over 1 hour
  - Children 10 ml/kg over 1 hour (the risk of fluid overload is higher in children)
- Need **insulin**: consider referral to hospital
- Treat any underlying infections as a precipitating factor

HYPEROSMOLAR HYPERGLYCAEMIA STATE (HHS)

DEFINITION

An emergency complication that **occurs in type 2 diabetes**. It can be caused by illness, dehydration or not taking diabetes medication e.g. because unwell or late diagnosis. It causes severe dehydration inside the cells of the body, and can be life threatening.

SIGNS AND SYMPTOMS

- Generalised weakness, leg cramps, visual problems, nausea/vomiting (less than in DKA)
- Progresses to confusion, neurological signs, seizures, coma

DIAGNOSIS

To diagnose HHS there must be: **hyperglycaemia, very high blood dextrose e.g. >600mg/dL** (>33mmol/L)

TREATMENT

As per DKA

NON-EMERGENCY (CHRONIC) COMPLICATIONS

Diabetes Mellitus causes long-term damage to the body if it is not treated well:

- **Blood vessel (vascular) disease**: stroke, heart disease, heart attack, peripheral vascular disease (poor blood supply causing cold or painful feet), ulcers that heal slowly.
- **Kidney failure**: protein positive on urine dipstick.
- **Eye disease**: cataracts, glaucoma, damage to the retina (patient complains of blurred vision).
- **Nerve damage**: numbness, tingling and sometimes pain in the hands and feet (worse at night).
- **Feet problems**: due to poor blood supply and numbness, diabetic feet are at increased risk of infections and wounds.

TREATMENT OF CHRONIC SYMPTOMS

Diabetes treatment should lower the blood sugar to normal levels. Normal glucose prevents long term damage. **Note**: Diabetes mellitus is a chronic disease. Treatment and follow up for chronic care are life-long.

Normal random blood sugar levels are between 70 – 140 mg/dL (3.8 – 7.8 mmol/L)

1. **Explanation and advice**
   When you have made the diagnosis of diabetes, explain to the patient what diabetes is. Tell them that there is no cure for diabetes and that they will have this disease for life (except diabetes in pregnancy – see obstetric guidelines). Diabetes can be controlled with diet, exercise and medications. There are drugs which can lower the blood sugar and there are also life style changes that the patient can do to help lower the blood sugar level.

2. **Life style treatment**
   It is important for all diabetic patients to change their lifestyle. Some diabetics can bring their blood sugar level back to normal just by lifestyle treatment.

Diet:
- **Carbohydrate**
  - Eat starchy foods (lentils, beans, oats) instead of rice, sticky rice, bread or noodles
  - Be aware that rice and noodles raise the blood sugar.
  - If you can, choose wholegrain varieties (like brown rice if available or not expensive), or eat potatoes with their skins on
- **Vegetables and Fruit**
  - Eat lots of vegetable e.g. cabbage, pumpkins, cauliflower, mushroom, watercress
  - Eat fruits that are less sweet e.g. pomelo, apples, lime
- **Eat less Fat**
  - Try to steam instead of fry
  - Use chicken > beef > pork – remove fatty part and skin, remove fat from soup
- **Eat less Sugar**
  - e.g. sweets, biscuits, fruit juices, soft drinks like coca cola, sugar cane, honey, 3 in 1, sweet tea, Ovaltine/Milo
- **Eat less Salt**
  - Reduce salt in cooking, less dry salty fish

Alcohol: Advise the patient to stop or if cannot stop try to reduce

Smoking: Advise the patient to stop or if cannot stop try to reduce

Exercise: Advise the patient to do some exercise – try to do at least 30 minutes every day: e.g. walking, playing football, gardening.

At the time of diagnosis, if the random blood sugar is mildly elevated, **140-200 mg/dL** (7.7-11.1 mmol/L), try lifestyle treatment first. If it does not work after one month, then start medication.

3. **Foot care advice**
   - People with diabetes can have problems with the nerves and blood supply to their feet. This causes decreased sensation in the feet so they cannot feel trauma to their feet.
   - It is important to **check feet every day for abrasions, cuts, redness or any signs of infection**. Skin in diabetic patients may heal very slowly.
   - If there is poor healing or signs of infection, they should come to the clinic so that any infection can be treated early. To prevent trauma, make sure nails are cut, **wear shoes** that are not tight.

4. **Diabetic Medication**
   - Start treatment if the dextrose is **>200 mg/dL** (11.1 mmol/L), or lifestyle treatment is not working.
   - **Check that the creatinine and BUN is normal before starting metformin** – discuss with the doctor if it is abnormal.
   - The aim is to make sure that the random blood sugar levels are brought within the normal range.

There are many diabetic medications. If you are not sure about the treatment, always discuss with a doctor or supervisor how to use them. The common diabetic medications available are:

Name of Drug	START DOSE	MAX. DOSE	NOTES	Contraindications	Side effects
METFORMIN	500mg BID	2500mg within 24 hours	Give with meals. Better in overweight patients	Liver disease, renal failure, hypoxia (risk of lactic acidosis)	Gastrointestinal side effects better if taken with food. Can give TID to decrease side effects.
GLIBENCLAMIDE	5mg OD Elderly: 2.5mg OD	15mg OD	Give with breakfast	Patients who do not eat regular meals, liver/renal failure, pregnancy	Can cause hypoglycaemia if the patient does not eat 3 regular meals

a. Start with **metformin** 500mg BID
b. After 1-2 weeks if glucose still high, increase **metformin** to 1g BID (or 1g in the morning and 500mg in evening). Follow up in 1-2 weeks to check glucose. Continue until you are giving the maximum dose for metformin. If the total daily dose is >2g/day, you can divide TID to decrease side effects.
c. If the blood sugar still high on the maximum metformin dose ADD **glibencamide** 5mg OD with breakfast.
d. After 1-2 weeks, check glucose. Increase **glibenclamide** to 7.5 mg or 10mg OD if glucose high. Follow up every 1-2 weeks and increase glibencaminde dose if needed. Continue until you have reached the maximum dose for glibencamide
e. If blood sugar is not controlled, refer to a hospital or clinic where insulin can be given.
f. If they cannot go to another hospital or clinic, continue the oral medication, but counsel the patient that they are at risk for complications of diabetes because their dextrose is poorly controlled.

If the patient takes diabetic medication and does not eat regularly (unwell, vomiting), they are at risk of hypoglycaemia (low blood sugar). Counsel the patient and family how to recognise symptoms of hypoglycaemia and how to treat it (eat sugary drink/food). Seek medical care if unwell and cannot eat normally.

BLOOD PRESSURE MEDICATION

- In diabetic patients SBP should be less than 130 and DPB less than 80 (BP <130/80mmHg)
- ACE inhibitor e.g. enalapril is recommended first line anti-hypertensives in diabetes (beta blockers are not recommended because it decreases the symptoms of hypoglycaemia)
- **Note**: ACE inhibitors can cause congenital defects. Use family planning for menstruating women.

ASPIRIN (ASA) THERAPY

Use aspirin (75mg/day) as a primary prevention in patients with increased cardiovascular risk (men >50 years or women >60 years, and have >1 risk factor (*see p.40*).
Note: Avoid ASA if recent history of gastritis, bleeding problem or less than 16 years.

5. Follow up consultation

The aim is to educate, achieve good blood sugar levels (normal range 70-140mg/dL) and check for complications that are treatable.

- When starting medication review the patient every 1-2 weeks until blood sugar level is stable. Continue to inform the patient about diabetes and remind him/her about diet and medication.
- When blood sugar level is stable, review every month.
- Educate the diabetic patient about eating frequent meals with solid foods to avoid hypoglycaemia.
- Warn every patient who is on medication about the symptoms of hypoglycaemia and how to treat at home.
- Educate the patient how to treat low blood sugar (drink a sugary drink/water mixed with sugar)
- Educate the patient on foot hygiene, make sure nails are cut, wear shoes that are not tight and do not cause abrasions, if possible.
- Examine feet daily for wounds, infection, if there is any trauma that is not healing or any signs of infection they should come to the clinic so that any infection can be treated early.

Ask if:
Symptoms: have they improved?
Complications: cold feet, numbness, vision problems (if present: show to doctor).
Have they had hypoglycaemia? Describe the symptoms (see below) and explain this is because of low blood sugar.

Examine:
Every month: BP, start anti-hypertensive medication if high
Look at feet for infection, wounds, test for numbness and check lower limb pulses
Dorsalis pedis (anterior foot) and posterior tibal pulses (behind the ankle)

Figure 10.3 Examination of the dorsalis pedis pulse

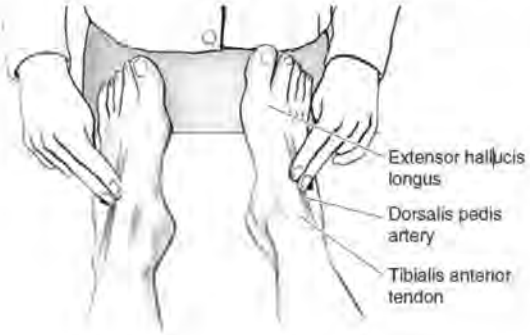
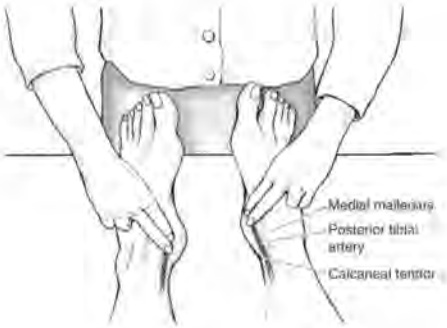


Figure 10.4 Examination of the posterior tibialis pulse



Every 12 months: Urine dipstick for protein (kidney damage)
Look for signs of heart failure
If possible test vision at an eye clinic to look for cataract
Fasting lipid profile

Figure 10.5 Random blood sugar level assessment

	VERY GOOD	GOOD	TOO LOW	TOO HIGH
BLOOD SUGAR LEVEL	**70 - 140mg/dL** (3.8 - 7.7mmol/L)	**< 180mg/dL** (< 10mmol/L)	**< 70mg/dL** (< 3.8mmol/L)	**> 180mg/dL** (> 10mmol/L)
WHAT TO DO	Continue same treatment		Treat hypoglycaemia. Check if patient is eating regularly. If yes: decrease medication. If not: counsel on diet, regular eating.	Refer if diabetic emergency. Increase medication. Find and treat infections (e.g. UTI). Give diet education.

Note: Post prandial (after eating) dextrose should be <180mg/dL. If high, need to confirm with fasting level.

DIABETES IN PREGNANCY

Pregnant diabetic women have higher rates of stillbirth, pre-eclampsia, premature labour and very large babies (or less commonly, very small babies).
See Obstetric guideline for treatment and management.

PREVENTION
See lifestyle treatment.

10.2 HYPOGLYCAEMIA

DEFINITION
Hypoglycaemia: blood dextrose <70 mg/dL (< 3.8mmol/L)
Severe hypoglycaemia: blood dextrose <45mg/dL (2.5mmol/l)
Note: for severe malaria, dextrose < 40mg/dL (2.2mmol/L) is diagnosed as hypoglycaemia. (*See malaria guidelines*).

CAUSES

- Diabetic medication dose is too high especially **glibencamide** and **insulin** because both increase insulin in blood
- A diabetic person took his/her medication but then did not eat
- Malaria (especially in pregnant women and/or undergoing quinine treatment)
- Other infections
- Non-diabetic medications e.g. beta blockers, aspirin poisoning, quinine
- Liver failure
- Adrenal gland failure (Addison's disease – patients have hypotension, and/or electrolyte imbalance, this is common in advanced HIV and /or TB patients)
- Tumour in pancreatic cells (Islet cell tumours cause increased insulin in the blood)

SIGNS & SYMPTOMS

- Sweating, feel hungry, tremors, dizziness, palpitation
- More severe: drowsiness, confusion, aggressive or irritable behaviour, convulsions and coma.

DIAGNOSIS

- Check blood sugar to confirm diagnosis.
- Find the underlying cause (e.g. malaria).

TREATMENT

- If dextrose 45-70mg/dL:
  - Give oral sugar solution (water with sugar) or sweet drink to prevent severe hypoglycaemia.
  - Example:.Glucose powder (15-20 g) as **glucose drink** or 150-200 ml of **fruit juice** or 3-4 tea spoons of **sugar** dissolved in water.
- If dextrose <45mg/dL:
  - If can to drink: give oral sugar solution (water mixed with sugar) or sweet drink
  - **If cannot drink e.g. in coma**: insert IV cannula and give Adult/Child: **5ml/kg 10% dextrose bolus**, Neonate **2ml/kg 10% dextrose**
- After giving oral/IV dextrose **re-check blood dextrose after 15 minutes** to make sure it is >70mg/dL. If on diabetic medication review the dose. Treat any other cause e.g. malaria, infection.

Note: 15 g of sugar is needed to increase blood glucose approximately 36 mg/dl within 20 minutes.

PREVENTION

Educate diabetic patients about eating frequent small meals of solid food to avoid hypoglycaemia.

10.3 THYROID DISEASE

DEFINITION

The thyroid is a small gland located in the front of the neck. It makes two thyroid hormones (thyroxine/T4 and triiodothyronine/T3). The thyroid hormones control metabolism. Thyroid hormones affects almost every organ in the body. They tell the organs how fast or slow they should work. Thyroid-Stimulating Hormone (TSH) is made by the pituitary gland. TSH controls how much thyroid hormone is made.

Figure 10.6 Thyroid function test assessment

TSH	FT4	Conclusion
Normal	Normal	No thyroid problem (euthyroid)
↑	↓	Hypothyroid
↑	Normal	Sub clinical hypothyroid
↓	↑	Hyperthyroid
↓	Normal	Sub clinical hyperthyroid
↓	Normal or ↓	Non-thyroidal illness

10.3.1. HYPOTHYROIDISM

DEFINITION
Underactivity of the thyroid gland.

SIGNS & SYMPTOMS
- Constipation
- Tiredness and depression
- Dry and cold skin
- Hoarse voice
- Hair loss
- Oedema of the face
- Increased frequency of menstruation

DIAGNOSIS
- **Clinical**: Feel the thyroid gland (goitre, nodules), pulse, look for dry skin, oedema
- **Laboratory test**: TSH, FT4 for diagnosis, TSH only for follow up of treatment.

TREATMENT
Hypothyroidism is a chronic disease. The patient will need to take life-long treatment. They must be able to follow up regularly for chronic management.

SUBCLINICAL HYPOTHYROIDISM
(high TSH, normal FT4):

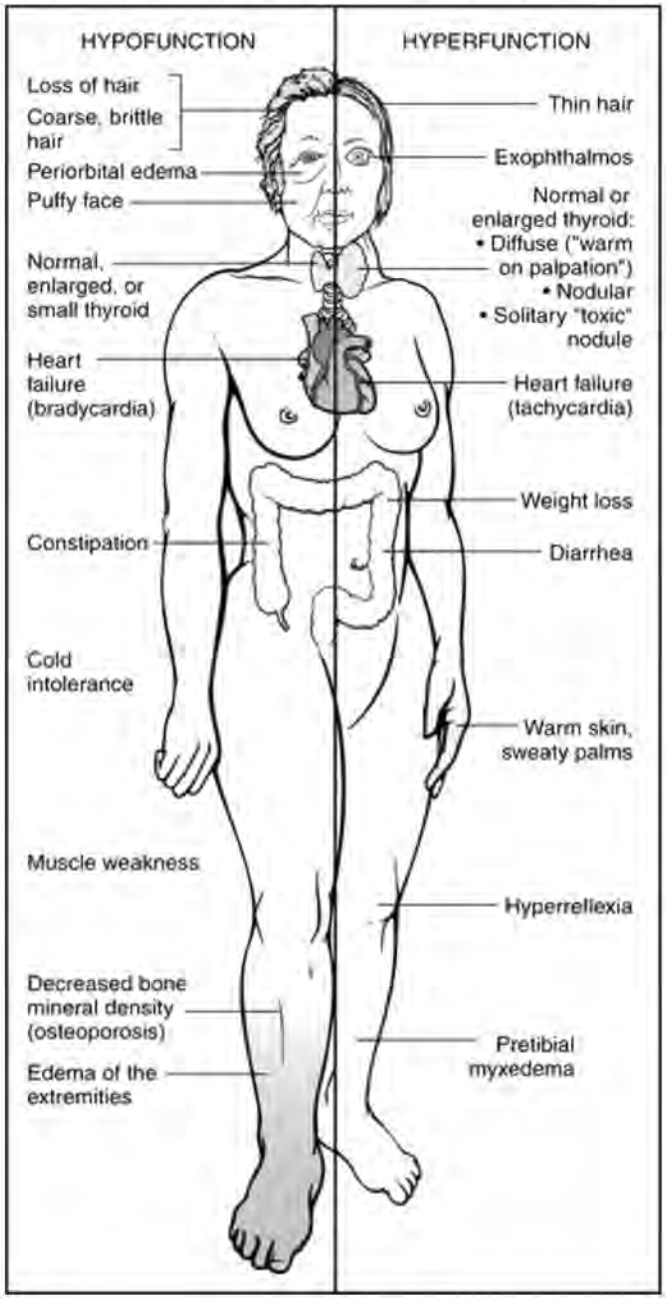
- Wait and see
- Repeat blood tests every year
- **There is a risk of progression to clinical hypothyroidism, especially if the TSH rises above 10 mU/L.**
- In patients with non-specific symptoms and TSH greater than 10mU/L, try to treat the sub-clinical hypothyroid early because there is risk to develop severe hypothyroidism.

HYPOTHYROIDISM
(high TSH, low FT4):

If <50 years AND no history of ischaemic heart disease (angina):
- Start thyroxine 50mcg OD
- Increase after 4 weeks to 100-150mcg OD if still have symptoms
- Re-check the TSH after 4 weeks and change the dose according to the results

If ≥50 years OR history of ischaemic heart disease (angina):
- Start thyroxine 25mcg OD
- Increase after 4 weeks to 50mcg OD depending on improvement in signs and symptoms
- Re-check only the TSH after 4 weeks (total 8 weeks after starting thyroxine) and change the dose according to the results

Figure 10.7 Signs and symptoms of thyroid disorders



Note: thyroxine dose is micrograms (mcg) not milligrams (mg) e.g. 50mcg = 0.05mg.
Do not give thyroxine with aluminium hydroxide or ferrous sulphate. It decreases absorption of the drug.

Follow up TSH check:

- If TSH high: increase the dose by 25-50mcg
  - Re-check the TSH in 4 weeks
- If TSH normal: continue the same dose
  - Re-check TSH in 6 months OR in 12 months if 2nd time TSH is normal
  - If symptoms begin again check before
- If TSH is low: decrease the dose by 25-50mcg
  - Re-check the TSH in 4 weeks.

Thyroid medication will take at least 4 weeks to work. When changing medication dose, check thyroid tests after 4 weeks.

Hypothyroidism in pregnant women should be monitored carefully, with frequent thyroid function tests. Delivery should be at SMRU and observe the neonate carefully for signs of thyroid disease. For neonatal hyper or hypo thyroid diagnosis and treatment, please *see Neonatal Guidelines.*

PREVENTION

Patients should take their medication regularly and come to the clinic for consultation.
They should be able to recognise the signs or symptoms of too much or not enough thyroid hormone.
They should be made aware that some other medications could interact with their thyroid medication.
They should discuss all new medications with their doctor.

10.3.2. HYPERTHYROIDISM

DEFINITION

Overactivity of the thyroid gland

SIGNS AND SYMTPOMS

- Diarrhoea
- Nervousness
- Weight loss
- Feeling warm
- Sweatiness
- Exopthalmia (protruding eyes)
- Tachycardia, palpitations or atrial fibrillation (in some patients)
- Tremors in the hands
- Reduced frequency of menstruation (oligomenorrhoea)

DIAGNOSIS

- Clinical: check pulse rate, (ECG – for atrial fibrillation), feel the thyroid (goitre, nodules), tenderness
- Laboratory test: TSH and FT4. If the TSH is abnormal and FT4 is normal, you may need to check T3.
- Hydatidiform molar pregnancy can look like hyperthyroidism (*see Obstetric Guidelines*).

TREATMENT

For treatment in pregnant women, *see Obstetric Guidelines*. Hyperthyroidism in pregnancy can cause irreversible cognitive delay (mental retardation) in the fetus/infant.
If the patient is in thyrotoxic crisis or you are not sure, discuss with the doctor.

Check CBC and liver function tests (ALT, ALP, Bili) before starting propylthiouracil.
This drug can cause low WBC (agranulocytosis) and liver toxicity.
These are not common but you should check the patient and symptoms each visit.

Propylthiouracyl (PTU) 50mg tablet (this is an anti-thyroid drug which will block the thyroid hormone)

- Start **PTU** 200-400mg per day in divided doses e.g. 2 tablets BID – 4 tablets BID.
- Check TSH, CBC and liver function tests after 4 weeks, then every 3 months.
- When TSH and clinical signs are becoming normal: slowly decrease dose by 50mg every 2 months to 50 -150mg daily in divided doses.
- Continue maintenance treatment for 12 to 24 months, then discontinue treatment to see if the patient is still hyperthyroid. Follow clinical symptoms (*see Follow up, next section*).

- There is a risk of hepatotoxicity. Counsel patients how to recognise symptoms of liver disease (anorexia, nausea, vomiting, fatigue, abdominal pain, jaundice, dark urine, itching)
- There is a risk of agranulocytosis (low neutrophils). This most commonly will occur in the first 6 months of treatment. Agranulocytosis can result in severe bacterial infections.
- For rapid symptomatic treatment of tachycardia and palpitations give **propranolol 40mg OD then increase to 40mg TID if needed**. Propranolol should not be used for long-term treatment but is useful in the short term.

FOLLOW UP

For the first 3 months follow every month and check:

- TSH to adjust medication
- CBC to check for low neutrophils. If decreasing from baseline, stop PTU.
- Liver function tests (AST, ALP, Total bili). If more than 3x normal, stop PTU.

Agranulocytosis most commonly occurs within 3 months of starting treatment. If the patient has a fever or infection in the first 3 months, check CBC and stop drug until the CBC results can be reviewed with a doctor.

After monthly follow up for 3 months, then follow up every 2 -3 month, then every year

- Check TSH every 3-4 months. When TSH is stable, check TSH every 6 months, then can check every year.
- When change drug dose, always check after 4 weeks.

Counsel the patients to:

- Take medication regularly
- Follow up regularly. If the patient cannot follow up regularly, do not start treatment. Wait until the patient can follow up regularly.
- Know the signs or symptoms of too much or not enough thyroid hormone.
- Know that other medications could interact with their thyroid medication.
- Discuss all new medications with their doctor.

Hyperthyroidism in pregnant women should be monitored carefully.
Check thyroid function tests often.
Delivery should not be at home and the neonate should be observed carefully for signs of thyroid disease. For neonatal hyper or hypo thyroid diagnosis and treatment, please *see Neonatal Guidelines*.

10.3.3. GOITRE

DEFINITION

A goitre is an enlargement of the thyroid gland. Endemic goitre occurs in areas where iodine in the diet is deficient. Our body needs iodine to make thyroid hormone. When there is not enough iodine in the food, the thyroid gland gets bigger. Hyper- or hypothyroidism may occur. Some foods can cause goitre: cassava, cabbage or turnips. Goitre is worse with smoking and pregnancy.

Iodine deficiency causes: foetal and perinatal mortality in pregnancy
and
physical and mental retardation in children

SIGNS AND SYMPTOMS
Swelling of the thyroid (at the front of the neck)
Hypo or hyperthyroidism symptoms (*see p.74*)

Clinical (WHO classification):

Group 0:	normal thyroid, no palpable or visible goitre.
Group 1:	palpably enlarged thyroid, but not visible with the neck in a normal position.
Group 2:	thyroid clearly visible with the neck in a normal position.

DIAGNOSIS
Clinical findings
TSH and FT4 if patient has symptoms of hyperthyroidism or hypothyroidism.

COMPLICATIONS
Pain or a sense of fullness in the neck is common. Frequently, there is no pain. Compression of the trachea and/or oesophagus leading to dyspnoea and/or dysphagia (rare) is a reason for surgery.

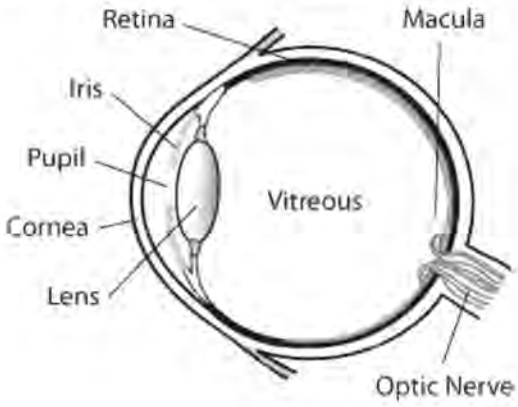
TREATMENT
- Encourage eating **iodised** salt.
- If available, you can give iodised oil
- **Note**: In children, goitre disappears slowly after several months. In adults, it disappears more slowly or never, even if improvement to normal thyroid function.
- A few patients will develop hyperthyroidism and require treatment for that condition. Surgery is only needed if the goitre makes local compression on the neck (airway or blood vessels).

DANGER SIGNS: If the swelling is irregular, you can feel one solitary nodule, there is a change in the voice or there is also cervical lymphadenopathy, then these may be signs of thyroid cancer – discuss with a doctor or refer.

PREVENTION
The best way to prevent goitre or iodine deficiency is to eat of iodized salt. If there is no iodised salt available, provide people living in iodine deficient areas with iodised oil.

Note: Some eye diseases can be treated at all clinics, and some diseases need treatment from centres that have specially trained medics and doctors

Figure 11.1 Anatomy of the eye



11.1 POOR VISION

POOR VISION ALL OF THE TIME

Poor vision is a common problem. Poor vision can be caused by eye disease or need eyeglasses. Poor vision is diagnosed by careful examination of the eye (cornea scars, cataracts, obvious infections etc.). **Children with poor vision** may have **strabismus** or "lazy eye" when only one eye is affected. If the poor vision is not treated with eyeglasses, the strabismus will become permanent. If both eyes are affected, there may not be any strabismus, but they should still be diagnosed and treated. (*see Strabismus 11.5.4*)

POOR NEAR VISION (LONGSIGHTEDNESS)

The patient cannot see close objects (poor near vision). Usually gets worse with age.

Longsightedness can be divided into two groups depending on age:

- People under the age of 40 with poor near vision are diagnosed with hyperopia. This can be corrected with plus power lens eyeglasses.
- Almost all people over the age of 40 will have poor near vision. Activities such as reading and sewing become difficult or not possible. Poor near vision from old age is normal and is called **presbyopia**. This can be helped with reading glasses (plus power lens eyeglasses).

POOR LONG-DISTANCE VISION (SHORTSIGHTEDNESS)

The patient cannot see far away objects. Close objects can be seen clearly e.g. schoolchildren who cannot read the blackboard. This is called **myopia** and can be corrected with minus power lens eyeglasses.

POOR VISION AT DUSK AND AT NIGHT

Night blindness is one of the early signs of vitamin A deficiency. On the Thailand-Myanmar border this is often referred to as 'chicken blindness'. Night blindness is more common in young children but can also occur in adults. People with this condition suffer from particularly poor vision at dusk, when it is just getting dark. For treatment, *see the Vitamin A Deficiency section* of these guidelines.

Figure 11.2 Pinhole test to check if need eyeglasses

A **PINHOLE test** can help to know if a person needs eyeglasses. First test patient's vision (Snellen chart or read something held away by one arm's length). Then make a very small hole in a piece of paper. Test vision again with the PINHOLE. If vision improves with the pinhole, then the patient needs eyeglasses.

11.2 EYE INFECTIONS

For photo, see Appendix 1

11.2.1. CONJUNCTIVITIS

DEFINITION

Can be caused by a bacterial or viral infection, or an allergic reaction of the conjunctivae of one or two eyes. It is sometimes difficult to diagnose if an eye inflammation is due to infection (bacterial or viral), allergy, irritation or other causes.

SIGNS AND SYMPTOMS

- Red eye
- **Bacterial conjunctivitis**: often pus discharge, eyelids stuck together on waking up, infection of one eye at the beginning, usually responds to Terramycin Eye Ointment (TEO)
- **Viral conjunctivitis**: watery secretions, no itching, does not respond to TEO, usually disappears within one week without complications. In the rainy season there are often outbreaks of viral conjunctivitis. For example, in the past this affected up to 20-30% of the refugee camp population
- **Allergic conjunctivitis**: usually both eyes, lots of tears, eyelid oedema, itching, does not respond to TEO, reduce symptoms by washing eyes with clean water.
- **Congenital conjunctivitis**: due to *Neisseria gonorrhoea* or *Chlamydia* if child born to infected mother (if suspect treat infant and mother, discuss with a doctor or supervisor about eye complications)

Viral and allergic conjunctivitis do not respond to treatment with Terramycin Eye Ointment (TEO) but the ointment will relieve symptoms and will prevent secondary bacterial infection.

DIAGNOSIS

The diagnosis of conjunctivitis is based on the clinical examination

Bacterial and viral conjunctivitis can be very contagious.
Wear gloves when examining and/or wash hands well afterwards.

TREATMENT

- First choice medication for conjunctivitis is **Terramycin Eye Ointment (TEO)**
- Although TEO contains tetracycline (similar to doxycycline), it is safe to use ointment in children, pregnant and breast-feeding women
- Antibiotic ointment **TEO**: apply QID until two tubes are finished
- If do not have or no response to TEO: use **chloramphenicol** (1 drop 6 times per day)
- Hot compresses may help reduce swelling
- Show your patient how to put ointment or drops in the eye. Mothers may need to help their children putting eye ointment or drops in the eyes
- Tell the patient to wash their hands and face before and after touching the infected eye
- Ask the patient to return if the eye is not better after finishing treatment
- Never patch an infected eye

If serious eye infections, infections involving the cornea, and infections not responding to treatment refer to an eye specialist, e.g. Mae Tao Clinic, Mae Sot Hospital.

PREVENTION

- The patient should not touch the face or eyes with their hands
- Wash hands regularly

11.2.2. TRACHOMA

For trachoma grading card, *see Appendix 3*

DEFINITION

Trachoma is a highly contagious eye infection caused by the bacterium *Chlamydia trachomatis*. It is no longer common in the SMRU area. However, occasionally active infections are found in children, and adults who care for children. Most people will not be aware that they are infected. Trachoma is more common when sanitation and hygiene are not good. Health education and prevention are an important part of controlling infection.

With repeated infections over a lifetime, trachoma can cause blindness.

SIGNS AND SYMPTOMS

There are different stages of infection:

- Follicles (small bumps) → eye lid becomes inflamed → scar tissue forms → scarring of the cornea
- Scarring can cause vision loss and the eye has a higher risk to get infected by bacteria or viruses

DIAGNOSIS

- Made by external eye examination and checking the patient's medical history
- Look underneath the upper eyelid for the presence of follicles, signs of inflammation, the direction of the eyelashes and at the cornea. (*See WHO Trachoma Grading Card, Appendix 3*)
- Diagnosis should be made by a medic who has been trained in eye care so refer the patient to a clinic such as Mae Tao Clinic or Mae Sot Hospital

TREATMENT

Treatment of (Acute phase) follicles and inflammation:

- Clean eyes and face several times per day
- **Azithromycin**: Adult: 1g STAT, Child: 20mg/kg STAT give dose for patient and all of family
    - Can also use **TEO** in early stage to make eyes more comfortable
- If not better, give TEO BID for 6 weeks

Check all other family members for possible infection. Advise the patient to return to the clinic when treatment is finished for re-assessment, because sometimes the treatment needs to be repeated.

Treatment of (Late phase) scarring:

- In the later stages of trachoma, the primary infection may be gone but there is damage underneath the eyelid (scarring) and the eyelashes may turn in (trichiasis), causing damage to the cornea (corneal opacity).
- Usually surgery is helpful. These patients should be referred to a medic who has had eye training.
- While waiting for surgery, you can tape eyelashes to eyelid using thin strip of sticking plaster. This protects the cornea but it is important that the patient can blink and the eyelid can open and close perfectly. Replace the plaster when it starts to peel off (usually once a week), continue for 3 months. If the eyelid cannot close completely when the patient blinks, the cornea will become too dry and have risk for ulceration and infection.

Note: Do not remove eyelashes with forceps. This is now not recommended.

SAFE STRATEGY: TREATMENT AND PREVENTION

The **SAFE** Strategy is a public health approach to try to educate on treatment and prevention of trachoma.

- **S**urgery
- **A**ntibiotics (to treat the infection)
- **F**acial cleanliness (hygiene)
- **E**nvironmental change (increase access to clean water and sanitation)

PREVENTION

- The patient should not touch the face or eyes with their hands
- Wash hands regularly
- Health education on hygiene and sanitation

11.2.3. CELLULITIS OF THE EYE*NEW

DEFINITION

Infection of the skin around the eye (periorbital/pre-septal cellulitis) OR of the orbit (orbital cellulitis). Periorbital/pre-septal cellulitis occurs in the area anterior to the orbital septum (*see Figure 11.3*). Orbital cellulitis occurs in the fat and ocular muscles posterior to the ocular septum (*see Figure 11.3*). Both can cause eyelid swelling and redness but the prognosis and treatment are different. Orbital cellulitis is less common than periorbital cellulitis but is more severe and can cause vision loss.

CAUSES

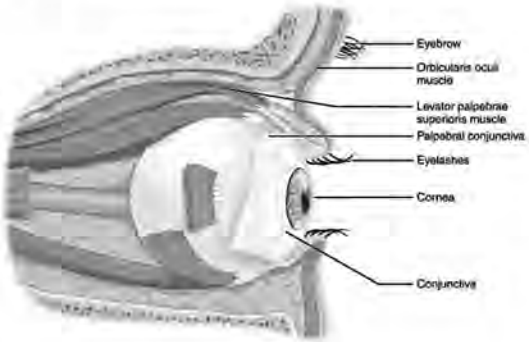
Trauma (including orbital fracture), insect or animal bites, foreign body, upper respiratory infection, infection of the tear duct, or sinusitis. Sinusitis is the most common cause of orbital cellulitis.

SIGNS AND SYMPTOMS

1. Periorbital (pre-septal) cellulitis – anterior to orbital septum
   - Fever
   - Eye pain
   - If there is pain with eye movements, think of orbital cellulitis (see below)
   - Swelling and redness of the eyelid or skin around the eye

2. Orbital cellulitis – posterior to orbital septum
   - Fever
   - Swelling and redness of the eyelid or skin around the eye may or may not be present
   - Double vision
   - Pain with eye movement
   - Eye muscle weakness causing strabismus
   - Proptosis (eyeball is pushed forward)
   - Swelling of conjunctivitis

Figure 11.3 Anatomy of the orbital septum



TREATMENT

- Take routine blood samples (e.g. CBC, CRP, blood culture).
- If suspect periorbital/pre-septal cellulitis, treat mild infection with **Augmentin (amoxicillin-clavulanate)**. Follow up should be scheduled regularly until the patient is improving. If moderate infection, admit to IPD and start **Ceftriaxone** and **Metronidazole**.
- If suspect orbital cellulitis admit to IPD and start **Ceftriaxone** or **Cefotaxime**, and **Metronidazole**.
- Ask every day about change in vision, double vision, eye pain.
- Daily examination for visual acuity, pupil light reflex.
- If the patient is admitted, discuss the case with the doctor. The doctor may add or change antibiotics and may want to take other investigations.

Complications are more common with orbital cellulitis (abscess of eye or periosteum, loss of vision, thrombosis, brain abscess). There is a risk that periorbital/pre-septal cellulitis can become orbital cellulitis. **If the examination becomes worse or the symptoms are not improving with treatment, think of TB, discuss with the doctor, or refer to the hospital.**

11.3 EYE INJURIES

Injuries or trauma to the eye can cause blindness or loss of the eye.
Once the injury has occurred, you must prevent secondary infection.

IMMEDIATE FIRST AID

Clean the eye carefully with a large amount of NSS or clean water.
If there has been alkali in the eye e.g. cement this can cause a very severe eye problem so wash with at least 5 litres of water and make sure all the objects are removed.

DIAGNOSIS
Need to examine the eye for any foreign bodies

- The eye will be very painful so ideally need to use anaesthetic eye drops e.g. **Tetracaine** 0.5%.
- If anaesthetic eye drops are not available use local anaesthetic e.g. 2-3 drops lidocaine instead.

Note: if only have lidocaine/adrenaline combination use with caution: adrenaline will cause the pupil to dilate (get bigger) which could cause an attack of angle closure glaucoma. If you use this then you must warn the patient if they get severe pain in the eye after a few hours to come back to the clinic immediately

If have fluorescein dye, examine the eye with a blue light. Check for corneal scratches (will be yellow)

TREATMENT

- Remove any foreign bodies. Look carefully at all areas of the eye especially the cornea and under the upper eyelid as this is where most foreign bodies attach to the eye.
- Apply a large amount of antibiotic ointment (TEO).
- If the cornea is scratched apply a pressure patch to the eye.
- Remove the patch and re-evaluate the next morning.
- Continue treatment with ointment and patching as needed.
- Never leave a patch on longer than overnight.

If an infection develops, STOP patching. A patched eye is a good place to grow bacteria.
NEVER PATCH AN INFECTED EYE!

- Serious injuries, where the eyeball has been opened or penetrated, should be referred to hospital. Use an eye shield (not a patch) if a patient with an open eye injury needs to be transported to another location. These serious injuries usually result in blindness or loss of the eye. Note: Shield both eyes to prevent eye movements because the unshielded eye can still see and will cause the injured eye to also move. This patient will need a caregiver to help them.

11.4 CORNEAL ULCERS

For photo, *see Appendix 1*

DEFINITION
An ulcer on the cornea of the eye.

CAUSES

- Corneal ulcers may be caused by damage to the eye. This might be small like a foreign body in the eye (most common cause). They may be bacterial, or fungal, and can be very difficult to know which is the cause.
- History is important: if the injury is by vegetable material it is likely that the infection is fungal.

SIGNS AND SYMPTOMS
Very painful eye, red and watering, and often the ulcer can be seen in the cornea as a greyish area.

DIAGNOSIS
If a drop of fluorescein dye is put in the eye and the eye examined with a blue light, the ulcer will stain yellow.

TREATMENT

- If possible, refer to an eye doctor.
- Bacterial corneal ulcers may respond to antibiotic treatment but fungal ulcers are very difficult to treat as there are no very effective antifungal agents.
- Corneal ulcers need to be treated very intensively with topical antibiotics e.g. chloramphenicol drops every hour.

11.5 DISEASES OF THE EYE

For photo, *see Appendix 1*

11.5.1. CATARACT

DEFINITION
A cataract is a condition of the eye that affects the ability to see. It can affect all or part of the lens (the part of the eye that we see through). Cataracts are probably the leading cause of blindness on the Thailand-Myanmar border.

DIAGNOSIS
When looking through the pupil: the affected lens will be cloudy white in colour.
It will be difficult to see the back of the eye with an ophthalmascope.

TREATMENT
Refer to an eye doctor who can do cataract surgery.
There are no medicines that can treat cataract. Only surgery will help.

11.5.2. PTERYGIUM

For photo, *see Appendix 1*

DEFINITION
Pterygium is the name for tissue growth on the cornea. It is located medial to the iris and it will grow from the nasal (nose) side of the eye towards the pupil onto the cornea. A pterygium can be white in colour, but can also lookt like conjunctiva or muscle tissue. Long exposure to sunlight is a risk factor and most patients with pterygium have a family history (genetic influence). Once a pterygium is present, it will not go away.

Pterygium is not an infection, there is no need to provide treatment with TEO

TREATMENT
Surgery is the treatment and is done depending on the size of the pterygium.

- **Small pterygium**: does not need removal, because it can come back after surgery (will grow back faster). Counsel the patient that this is not an infection or serious (tumour) growth.
- **Large pterygium**: can reach the pupil and affect vision. This needs surgery. When a pterygium reaches 2 or 3 millimetres from the pupil, the refer to an eye surgeon if possible.

11.5.3. GLAUCOMA

DEFINITION
Glaucomais a disease of the optic nerve where it gets damaged because of **increasing pressures inside the eye** (called intra-ocular pressure (IOP)). The damage is irreversible.

There are two types of glaucoma:
Acute (Closed Angle) Glaucoma: when the pressure of the eye suddenly increases which can lead to blindness within a few months. This type is much more common on the Thailand-Myanmar border. (*see below*)

Chronic (Open Angle) Glaucoma: when the eye progressively gets damaged by high intra ocular pressure. Some types of glaucoma are painless and progress slowly and silently.

ACUTE CLOSED ANGLE GLAUCOMA = EMERGENCY	
SYMPTOMS	Rapid onset severe pain in eye and surrounding the eye, blurry vision, nausea, vomiting
EXAMINATION	Patient unwell, red eye, hazy cornea, non-reactive mid-dilated pupil usually only one eye
TREATMENT	**Acetazolamide** 500mg PO STAT and **pilocarpine 2%,** 1 drop both eyes REFER PATIENT TO HOSPITAL IMMEDIATELY

DIAGNOSIS

- **Measure Intra-ocular pressure** with eye pressure tool (Schiotz tonometer): Intra Ocular Pressures (IOP) will be raised (IOP normal range 10mm - 22mmHg).
- **Check visual fields** (confrontation test): there may be visual field loss: this is irreversible.
- Look with **ophthalmoscope**: you may see optic disc cupping.
- Check **light perception** and **pupil reaction**: in advanced glaucoma, the patient has abnormal pupil reactions to light due to loss of the optic nerve.

TREATMENT

Glaucoma is an ophthalmic emergency. Patients can become blind if diagnosis and management are delayed.

If you suspect glaucoma start treatment immediately with:
- **Acetazolamide** (Diamox) 250mg PO QID
- **Pilocarpine** 2% 1 drop QID for both eyes

- REFER IMMEDIATELY for surgery to avoid complete blindness
- After surgery, patients should have regular IOP checks and control of glaucoma medication

11.5.4. STRABISMUS

DEFINITION
Strabismus is when the eyes do not look in the same direction. Sometimes it is called "lazy eye".

CAUSES
In children:
Strabismus usually occurs because of poor vision, but can be caused by an eye defect.
If not treated with eye glasses, the strabismus may become a permanent lazy eye.

In adults:
Strabismus occurs suddenly and are due to paralysis of one of the muscles.
This may be caused by something very simple (abscess, Grave's disease) or be a sign of serious illness (brain cancer, TB meningitis).

Figure 11.4 Strabismus and correction

DIAGNOSIS
- Often develops in a child with normal eyes when aged 3-4 years.
- Listen to the parents, as they are the most likely to notice a strabismus in an infant.
- Shine a torch from about one metre and observe the central corneal light reflex, it should appear in the same place in both eyes. If there is strabismus, the light reflex will be more medial or lateral on one side.
- Shine the light into the eyes while asking the patient to look at your nose, cover the eye you think is normal with your hand and observe the eye you think has strabismus. If it does not move, there is either no strabisms or the eye is blind.
- Children who can cooperate with a vision test should be assessed.
- In children with poor vision, both eyes should move in all directions when tested. If the problem is eye muscle paralysis, the eye will not move normally during examination.

TREATMENT
If you diagnose strabismus, refer the patient to an eye specialist.
If not treated by 6 yr of age, the child can lose sight permanently in the eye.

11.6 XEROPHTHALMIA

DEFINITION
Vitamin A deficiency is a major problem (not only in diseases associated with the eyes, but also for childhood illnesses and child mortality). **Xerophthalmia** is an eye condition associated with Vitamin A deficiency. **If not treated it can progress to irreversible blindness**. Vitamin A deficiency can occur in anyone, but usually affects children between 1 and 6 years old. Most breast-fed babies will not have vitamin A deficiency.

SIGNS AND SYMPTOMS
The clinical stages of xerophthalmia:
1. **Night Blindness**: Poor vision in dusk when the sun goes down. This symptom is known as 'night blindness' or 'chicken blindness', and is often the first sign of xerophthalmia.

2. **Conjunctival dryness** (Conjunctival xerosis): Dryness of the tear layer on the conjunctiva. The conjunctiva will start to look dry and rough. Even after the patient blinks, the eyes remain dry.
3. **Bitot's spots**: Bitot's spots are bubbles or foam on the conjunctiva that usually appear close to the cornea. The spots are mostly white/grey coloured (*see Appendix 1*).
4. **Corneal dryness** (Corneal xerosis): It is easy to see if the cornea becomes dry as it does not reflect light well and does not look smooth.
5. **Corneal ulcer/ keratomalacia**: If the cornea stays dry too long, it can develop bacterial or viral infections known as corneal ulcers. These can cause holes on the cornea (keratomalacia). If a patient has a corneal ulcer, they can have permanent vision loss in that eye.
6. **Corneal scarring**: When the cornea heals, there may be scarring which can cause blindness. Corneal scarring is permanent.

Note: Not all patients with vitamin A deficiency will develop eye complications (or the eye shows only a little drying), but some infections can cause rapid deterioration and blindness can develop in just a few days. Long-term vitamin A deficiency can cause gradual damage to the eyes.

DIAGNOSIS

- Diagnosis is made by an external eye examination and investigation of the patient's medical history.
- Check for all stages of xerophthalmia in both eyes.
- Final diagnosis should be made by a medic who has been trained in eye care.

TREATMENT

- Corneal dryness should be treated with TEO to prevent corneal ulcer or infection. Apply BID and protect eye with an eye pad after each application. Give enough TEO.
- All patients seen with corneal ulcers/ keratomalacia must be seen by a doctor.
- Vitamin A treatment:

Children less than 6 months
50,000 IU on days 1, 2, and 8

Children age 1 year and older and adults (>8 kg)
200,000 IU on days 1, 2, and 8

Children between 6 and 11 months (<8 kg)
100,000 IU on days 1, 2, and 8

Women of reproductive age
25,000 IU once a week for **8 weeks**

Vitamin A capsules are available in two sizes: 200,000 IU (International Units) and 25,000 IU capsules. Read the bottle for the strength of the capsules. Write down carefully on the record the date and dose of treatment.

* In case of **night blindness and Bitot's spot**:	* In case of **corneal dryness** and **corneal ulcer/ keratomalacia** risk of blindness outweighs risk to baby:
Vitamin A 10,000 IU PO daily OR 25,000 IU PO per week for at least 4 weeks	Day of diagnosis (day 1) 200,000 IU Next day (day 2) 200,000 IU 1 Week later (day 8) 200,000 IU (This schedule should be supervised by a doctor) Also treat for cornea dryness with TEO as above

PREVENTION OF XEROPHTHALMIA

See Vitamin A deficiency chapter. Distribution of vitamin A capsules to each child every 6 months is effective in prevention of Vitamin A deficiency, especially in children with measles, severe diarrhoea, or severe respiratory tract infection.

PREVENTION OF XEROPHTHALMIA VITAMIN A DEFICIENCY

Newborn	Vitamin A 50,000 IU at birth.
Less than 6 months (if not given at birth)	Vitamin A 50,000 IU.
Children 6 months to 1 year	Vitamin A 100,000 IU. Every 4-6 months.
Children 1 year and up	Vitamin A 200,000 IU. Every 4-6 months.
Women of child bearing age	Vitamin A 200,000 IU (give within 1 month of birth).

Document every time when giving a child vitamin A.
Overdose can cause raised intracranial pressure, impaired consciousness, convulsions
Give all children with measles vitamin A.

12.1 FAMILY PLANNING GUIDELINES

During the consultation for family planning advice, the following points should be discussed:

1. Ask the patient how many children he/she has.
2. Do they want more children? How long do they want to wait before the next pregnancy?
3. Does the patient know all the different forms of family planning?
4. What have they heard about the different forms of family planning?
5. Did the patient have a recent abortion?
6. Does the patient have a history of migraine or other serious medical problems?
7. Does she smoke?
8. Is the patient breast-feeding at the moment?
9. Check for a history of abnormal vaginal bleeding or discharge.
10. On examination, check for abnormalities of blood pressure, liver, breast, or cervix.
11. Is the patient pregnant? When in doubt, perform a pregnancy test. (See Family Planning Flow Chart)
12. Investigate any abnormal bleeding or discharge.

Contraception is for non-pregnant women

In very early pregnancy it is hard to be sure if a woman is pregnant or not. When pregnant women accidentally take contraception, it does not cause the baby to be abnormal or cause abortion. *See the* ***Family Planning Flow Chart*** *(see Appendix 4)* to decide if a woman is pregnant or not, and when to give short-acting contraception, when to give long acting reversible contraception (LARC) and when to give emergency contraception.

12.2 EFFECTIVENESS OF CONTRACEPTION

Implant, sterilisation and intra-uterine device (IUD) are the most effective methods. For women who want family planning and would have a high-risk pregnancy if they become pregnant again it is important to encourage them to use one of these very effective methods of family planning. For more detail about each one *see below.*

Figure 12.1 Contraception and effectiveness

Method	Typical Use (usual mistakes)	Perfect use (no mistakes)
Implant	<1 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
Sterilisation (male or female)	<1 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
IUD	<1 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
Depoprovera	6 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
Pill (COC or POP)	8 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
Condom	15 in 100 women pregnant in 1 year	2 in 100 women pregnant in 1 year

The IUD and implant are known as **"Long Acting Reversible Contraceptives" (LARC) and are the best method** for most women because they are very effective and not permanent.

A method that is NOT EFFECTIVE is also NOT SAFE for a woman
at risk for mortality or morbidity in her next pregnancy
(e.g. severe HBP, grandmultipara, very old, TB, heart disease)

12.3 CONTRACEPTIVES

12.3.1. CONDOMS

A latex condom is a tube made of rubber and closed at one end. It fits over the erect penis. It contains all the semen ejaculated during intercourse, therefore preventing sperm entering the vagina. A condom can only be used once.

EFFECTIVENESS
Latex condoms are very effective (between 85-98%) if used every time during sexual intercourse. However, most people forget to use them every time or do not use them correctly. Because of this, people who use only condoms often have unplanned pregnancy.

CONTRAINDICATIONS
Rubber allergy, but this is rare. Check the lubricant: nonoxynol-9 can cause allergy. Switch condom brand.

Note: Do not use a condom with Vaseline, oil or nystatin. These products weaken the condom and it can break.

Condoms are the only form of contraception that protect against sexually transmitted infections including HIV if used properly

12.3.2. ORAL CONTRACEPTIVE PILL (OCP)

PREPARATION
Most tablets contain a combination of oestrogen and progesterone.

EFFECTIVENESS
The pill is about 99.7% effective if used properly every day. However, it is difficult for many women to remember to take a pill every day and it is 92% effective with typical use (sometimes forgetting one).

CONTRAINDICATIONS
DO NOT GIVE IF:

- The patient is ≥35 years old and is a smoker because of risk for complications
- The patient has a history of stroke, heart attack, angina or blood clot in legs (Deep Vein Thrombosis (DVT)) or lungs (Pulmonary Embolism (PE))
- Close family history of stroke or heart attack at < 45 years
- The patient has a history of migraine with aura (symptoms e.g. bright light, strange smell that occur before the headache) – discuss with doctor if unsure. Risk higher if ≥35 years old
- High BP (systolic ≥140 or ≥ 90) or severe diabetes mellitus (e.g. needs insulin)
- Breast or liver cancer (or active liver disease), gallbladder disease
- Pregnant or breastfeeding (ask the doctor about progesterone-only pill for these women)
- The patient has Systemic Lupus Erythematosis (SLE)
- Taking these drugs: carbamazepine, phenobarbital, phenytoin and rifampicin

MOST COMMON SIDE EFFECTS
Breast tenderness, nausea, weight gain, headaches, depression, some irregular menstrual bleeding.

GUIDELINE
Before prescribing oral contraceptive pills you must:

1. Take a full medical history and conduct a full examination, especially to exclude all of the above contra-indications.
2. Take a pregnancy test.
3. Examine the patient carefully to exclude abdominal mass or breast mass.
4. Discuss any questions or concerns with the doctor.

Advise all smokers to stop smoking.

You need to explain the possible side effects to the patient before they start oral pills. Most of the side effects will stop after 1 to 3 months. **Note**: nausea can be reduced by taking the pill at night.
For breakthrough bleeding (bleeding that occurs when not expected e.g. mid-cycle) that persists after 2 cycles:

- Check for possible causes of breakthrough bleeding: cervix disease; retained products of conception; missing pills; drug use e.g. antibiotics; and diarrhoea
- If all above causes are excluded, consider the 50µg or 60µg oestrogen combined OCP

Figure 12.2 Counseling for oral contraceptive pill

What to tell women taking the oral contraceptive pill:

1. Take one tablet every day at the same time, like when wake up or when go to bed
2. Start taking active tablets on day 1 of menstruation (no need backup contraception) OR start taking active tablets today and use condoms/no sex for 7 days.
3. Take the pill at the same time every day. If a pill is >12 hours late, take it as soon as remembered, continue taking the pills in the packet and use condoms for 7 days.
4. Continue to take tablets even when sick, or husband is absent.
5. Start the new packet as soon as the last tablet is finished.
6. If sick with **vomiting, or taking antibiotics**, the pill may not work well so continue taking pills but use condoms while sick, or on antibiotics, and for 7 days after.
7. If have any side effects or concerns then come back to clinic.
8. After stopping the pill, women can get pregnant very quickly, so it is important to take it regularly.

12.3.3. DEPOPROVERA INJECTION*UPDATE

PREPARATION
Each injection of Depoprovera (Depo) contains 150mg of medroxyprogesterone acetate in 3ml.
Depo contains no oestrogen and can be used for breastfeeding women. It can be given soon after delivery.

DOSE
1 injection of 3ml IM every 3 months.

EFFECTIVENESS
99% effective if used perfectly. It is less effective if women often forget or are unable to follow up regularly for injections. It is 94% effective with typical use. A common mistake may be to wait for menstruation before getting the next depo shot – these women often become pregnant.

CONTRAINDICATIONS
DO NOT GIVE IF:

- Liver disease (can give if HepBsAg positive and no symptoms or signs of liver damage/cirrhosis)
- Breast cancer or liver cancer
- History of stroke or heart attack
- Close family history of stroke or heart attack at < 45 yrs
- Severe high BP (SBP ≥160 or DBP ≥100mmHg), or severe diabetes mellitus (e.g. needs insulin)
- History of migraine with aura (e.g. bright light, strange smell before the headache) – discuss with doctor if not sure. Risk is higher if ≥35 years old
- The patient wants to have regular menstruation (recommend IUD or OCP)
- Systemic Lupus Erythematosis (SLE)

MOST COMMON SIDE EFFECTS

- Irregular or no menstruation (50% of women have no menstruation after 12 months on depo). The menstruation returns when depo is stopped.
- Other symptoms are nausea, weight gain, headaches, or dizziness.

WHEN TO START
Start at any time of the month. If starting within 7 days of menstruation, no need for condoms
If more than 7 days after start of menstruation need to use condoms for first 7 days after injection.

IMPORTANT
Make follow up very clear for the next injection due date (11-12 weeks).
If >2 weeks late for injection, do urine pregnancy test.

a) If positive do not give Depo.
b) If negative, give Depo and advise to use condoms for 7 days, and return to the clinic for repeat pregnancy test after 2 weeks.

Women who stop using the injection take longer to get pregnant after stopping as it takes longer for the hormones to leave the body, this is not affected by the length of time that the patient has been using Depo. This is not a good method for a woman who wants another baby and did not get pregnant quickly before.

Depo is not appropriate for long term contraception as one of the side effects is osteoporosis. The maximum recommendation is no longer than 2 years. Encourage Implant.

12.3.4. IMPLANTABLE DEVICES*UPDATE

PREPARATION
Implants contain a slow-release progestogen in rods (e.g. Jadelle & Implanex II = 2 rods, Implanon = 1 rod) placed just below the skin, usually in the medial, upper arm. Implants can be used for breastfeeding women and can be inserted postpartum. It is also safe after 1st trimester miscarriage, use immediately or up to 7 days after miscarriage. Because implants are expensive and require a small surgery to put in and take out, **make sure the patient is not pregnant before putting it in**!

DOSE
Implanon is effective for 3 years. Implanex II is effective for 4 years. Jadelle is effective for 5 years. Always check the box for the number of years.

EFFECTIVENESS
>99% effective. Fertility comes back quickly after removal. Easy for patients to use correctly. After insertion they don't need to do anything for many years.

CONTRAINDICATIONS
DO NOT PUT IN IF:

- Liver disease (can give if HepBsAg positive and no symptoms or signs of liver damage/cirrhosis)
- Breast cancer or liver cancer
- History of migraine with aura (e.g. bright light, strange smell before the headache) – discuss with doctor if not sure. Risk is higher if ≥35 years old
- The patient wants to have regular menstruation (recommend IUD)
- Systemic Lupus Erythematosis (SLE)

MOST COMMON SIDE EFFECTS

- Irregular or no menstruation, or infrequent spotting and bleeding; nausea; weight gain.
- **Note**: this is less of a problem than with Depo.

WHEN TO START
Same as for depo.

12.3.5. INTRA-UTERINE DEVICE (IUD)

PREPARATION
This is usually a copper device that sits inside the uterus and prevents fertilisation. IUDs are long acting reversible contraception (LARC): they can stay in for many years, usually about 5 years. Check the package of the IUD for the exact time. IUDs can also act as emergency contraception if inserted ≤5 days after unprotected sex. If not menstruating and > 5 days since unprotected sex, use a short acting method first. **Always confirm the patient is not pregnant before inserting IUD.** *See the OB guideline* for details about insertion.

EFFECTIVENESS
99.2% effective. The contraceptive is quickly reversible. **This is a very good contraception for monogamous (one sexual partner) women who have finished their family but do not want sterilisation. It is the best method for many women with medical complications because there are no drug side effects.** Easy for patients to use correctly. After insertion only need to check to be sure it is still there.

CONTRAINDICATIONS

DO NOT PUT IN IF:

- Pregnant or when pelvic infection
- Cervical or uterine cancer

MOST COMMON SIDE EFFECTS

- Insertion related e.g. perforation, unrecognised expulsion (if falls out, can't feel the threads).
- Heavier bleeding or cramping with menstruation. Treat with prn mefenamic acid, ibuprofen etc.

WHEN TO START

Insertion is easiest during menstruation, post-abortion or < 2 months postpartum.
Contraception is immediate

- Put in immediately after delivery (placed by hand or with sponge forceps in the uterus)
- ≥1 month postpartum (safer to wait to 42 days postpartum)
- ≥ 6-12 weeks after C/S
- ≥ 6 weeks after septic abortion
- ≥ 12 months after molar pregnancy (confirm no recurrence)

12.3.6. STERILISATION

TYPES OF STERILISATION

- **Male sterilisation** - also called VASECTOMY.
  - Available through referral to hospital or Mae Tao clinic
  - Two small incisions are made in the skin near the inguinal area to cut the vas deferens. Usually only Xylocaine is needed for anesthesia
  - Need to use another form of family planning for 3 months after vasectomy
  - This is a low risk procedure (not intra-abdominal procedure) and carries less risk for complications than female sterilisation
- **Female sterilisation**- also called TUBAL LIGATION
  - Can be done 24-48 hrs post-partum or between pregnancies (at least 4 wks after delivery)
  - Mini-laparotomy (cut through abdominal wall) - a small incision is made underneath the umbilicus or above the pubic symphysis and tubes tied and cut

EFFECTIVENESS

- 99.5% effective

CONTRAINDICATIONS

There are no contraindications to sterilization. But there may be some medical problems, such as high blood pressure, that are contraindications for performing a surgery. Discuss with the doctor for pre-surgery counselling.

DO NOT do sterilisation if the patient is not sure
she doesn't want more pregnancies.
The procedure is not reversible (cannot re-connect the tubes).

RISKS

Risks of any surgery e.g. bleeding, infection, chronic pain. Rarely, the surgery does not work (e.g. the tube re-connects or the surgeon cannot reach the tube).

12.3.7. EMERGENCY CONTRACEPTION*NEW

PREPARATION

Emergency contraception (EC) should be offered to women who come asking for contraception ≤5 days after unprotected sex. Emergency contraception is more effective if it is given early (e.g. 1-3 days after sex). There are 3 types of emergency contraception: IUD-EC, Packaged EC, and OCP-EC.

DOSE

1. **IUD-EC**: the copper IUD can be inserted any time ≤ 5 days after unprotected intercourse as emergency ontraception. (*This method also gives the patient long acting contraception at the same time*).
2. **Packaged EC**: If you have Packaged Emergency Contraception (EC), follow the instructions on the box.
3. **OCP-EC**: Active pills in OCP packs can be used as EC. Because the dose of hormone in OCP is not always the same, you need to check the mg on the package. The dose for OCP-EC is at least Levonorgestrel 0.5 mg and Ethinyl Estradiol 0.1 mg or 100 mcg – usually 4 or 5 pills for each dose. The patient should take this dose every 12 hrs for 2 doses (*see dosing chart*).

Figure 12.3 Emergency contraception dosing chart

OCP-EC dose chart			
Example	Levonorgestrel in 1 pill	Ethinyl Estradiol in 1 pill	How many pills to take
OCP A	0.15 mg	0.03 mg or 30mcg	4 pills every 12 hrs x 2 doses
OCP B	0.10 mg	0.02 mg or 20mcg	5 pills every 12 hrs x 2 doses

EFFECTIVENESS

IUD-EC: >99% , **Packaged EC**: 97-99%, **OCP-EC**: 97-98%

CONTRAINDICATIONS

- > 5 days since unprotected sex (IUD helpful up to 7 days. Consider if rape case or very high risk)
- Packaged EC and OCP-EC can be used in patients who cannot use OCP as long-term contraception
- IUD-EC: follow IUD contraindications

MOST COMMON SIDE EFFECTS

- Nausea and vomiting (if vomiting <2hrs after dose, take that dose again)
- Irregular bleeding, cramping

Women who use Packaged EC or OCP-EC should be counselled for an effective long-acting method. Give condoms/OCP/Depo and follow up in 2 weeks for pregnancy test and to start long-acting method (e.g. Implant, sterilisation).

12.3.8. LACTATIONAL AMENORRHOEA*NEW

Breastfeeding can be a very effective form of contraception if:

- The mother:
  - is feeding only breast milk
  - no menstruation (even a little bit of bleeding) since her postpartum bleeding stopped
  - does not have a history of short interval between pregnancies
- The baby:
  - feeds directly from the mother's breasts (e.g.mother is not squeezing out breast milk and feeding with a bottle)
  - feeds "on demand" (eg whenever the baby is hungry)
  - takes breastmilk <6 hrs between each feed
  - < 6 months old

If the woman has had NO BLEEDING since her postpartum bleeding and is nearly fully breastfeeding (e.g. okay if a little bit of water or rice occasionally) and the baby is <6 months old, lactational amenorrhea is still about as effective or more effective than condoms (>95%).

KEY POINT

if a woman is almost fully breastfeeding, has had no menstruation yet, and is < 6 months postpartum: if she wants LARC and has a negative pregnancy test, you can give it at that visit.

12.4 GENDER BASED VIOLENCE*UPDATE

DEFINITION

Gender Based Violence (GBV) is violence against a person on the basis of gender or sex. This can happen to males or females, old or young. Think about GBV if a patient has STI symptoms, teen pregnancy, no husband, history does not match injury, caregiver that does not take care OR takes too much care (like controlling), very old with unexplained injury, mental illness or disability. (*See GBV pocket guide, Appendix 5*)

Figure 12.3 Definition of Gender based violence

At the health clinic, ANY type of gender based violence is to be treated seriously, even if it is not yet recognised by international or traditional law.

12.4.1. TYPES OF GBV

1. **Sexual Violence** = any completed or attempted sexual act against a person's consent e.g. sexual assault, rape, child sexual abuse, forced prostitution, sexual harassment (sexual comments e.g. from employer). Rape can happen to both males and females. It is defined as the invasion of any part of a victim's body with a sexual organ or use of an object by a perpetrator.
2. **Physical Abuse** = any form of violence within a relationship, which can be violent or neglectful to cause physical pain/injury.
3. **Emotional and Psychological Violence** = non-physical violence by a partner or person that causes harm (frightened, humiliated, blamed etc.) e.g. verbal abuse, psychological abuse (threatening physical harm, destroying property), isolation (keep someone away from friends/other family).
4. **Social-Economic Violence** = non-physical, denying person income and social opportunities.
5. **Traditional Practices** = culture specific e.g. female genital mutilation, arranged early marriage under the age of legal consent, forced marriage, honour killings, child infanticide/neglect (killing/ making a child suffer because the gender is not what the parents wanted).

TERMINOLOGY

Survivor	=	the person who suffered from the gender based violence
Perpetrator	=	the person who commits the act of gender based violence
Incident	=	the act or event that the **survivor** is seeking help about
Consent	=	involves a voluntary agreement, for example: to consent to engage in a particular sexual act. Consenting people must have the mental capacity to understand the consequences of consent. Many countries have different ages for consent to sexual activity. This means that **a sexual act with someone who is NOT an adult by the law is considered rape**, because they are not old enough to consent.
Confidentiality	=	when you discuss cases, first be careful who you discuss with AND do not give identifying information (e.g. name, age, village, etc) unless it is for management purposes. **Never** post about the case online. Do not share everything the survivor tells you. You only share the necessary information with your supervisor or other people providing help. If you feel stressed or sad, try to debrief with other colleagues already involved with the case. The survivor must sign **a consent form** before you can share information about the case with other service providers. The health worker needs to explain who the information will be shared and the benefits and risks of sharing this information. The survivor can always refuse to share the information with others.
Child	=	Under Thai law person under the age of 15 years. Under Myanmar law under the age of 16 years. Laws may change so this definition should always be confirmed.

Recognising Domestic Violence

Many persons do not want to report domestic violence. Explain to the victim that they have the right to live without violence and that there are people who can try to help them.

12.4.2. GBV PRINCIPLES

Survivors have the right to dignity (self-respect). This right has been taken away by the perpetrator, and it must be explained to the survivor that:

The perpetrator is wrong
AND
It is not the survivor's fault

The **4 guiding principles** below should be followed by health staff whenever dealing with a case of violence.

1. **Security/Safety**
   - Find a safe place so the survivors (person and their children) are away from the perpetrator (person causing them harm).
   - Understand and respect that the survivor may not choose to leave the perpetrator yet but try to make a "safety plan" (e.g. contact the neighbour, run to the sister's house, contact police) if they choose to go home.
2. **Confidentiality and Consent**
   - Get written permission (consent) from the survivor to share information.
   - Explain that the information will only be used to tell the right people to help them.
3. **Respect**
   - Respect the choices, wishes, rights and dignity of the person. **Listen** carefully, do not judge or tell them what you think is best for them to do.
   - Do interviews and examinations in a private and confidential room with same sex staff (and interpreters) whenever possible.
   - Ask only relevant questions and avoid asking to repeat the history because this can be traumatic.
4. **Non-discrimination**
   - Everyone has the right to equal access to services to help them.

Figure 12.5 Priorities and principles of GBV (*see Appendix 6*new*)

12.4.3. MANAGING GBV CASES

The Thailand-Myanmar border has many organisations that have trained staff and facilities to help manage a patient who has suffered from GBV.

This chapter is about the SMRU GBV guideline.
You may follow your organisation's GBV guideline or modify the SMRU GBV guideline for your setting. It is better to train a small team to manage GBV cases because these cases need specialised care.

At SMRU clinics, the GBV site Team will have up to date information about these organizations. *See GBV flowsheet (see Appendix 6).*

Aggression by perpetrators make survivors feel they don't have control of their lives.
We must help survivors feel strong again and help them feel in control.
Start talking to the survivor with these (or similar) words:
"This is not your fault. You are not alone. We are here to help you..."
"How can I support you?" "You are very brave to speak with me about this."

GBV FIRST AID

As soon as you think the patient is a GBV survivor, contact the site GBV team about the best plan. Remember your role and responsibilities. If you do not have the correct training for GBV you may cause harm to the survivor. You can use the steps below to help you manage a GBV survivor, if needed.

Here is an outline of the steps to be considered:

- **DO** allow survivors to tell their story, **listen** to them. Be **kind**. Watch your **body language**.
- **DO NOT** ask history that has already been told or if the patient doesn't want to tell.
- **DO NOT** do an exam if it will need to be repeated (eg at referral hospital or by the doctor) or if the patient does not consent.
- **DO NOT** judge the survivor or say anything that makes the survivor feel guilty.
- At each step, consider if it is better to refer. If better for the survivor, offer referral.

1. **HEALTH**: Assess the patient for any **immediate life-threating medical injuries** that need treatment e.g. suturing bleeding wound. **Note**: it is important to document very clearly any injuries, and what treatment has been given. If possible, take a photo of the injuries before treatment. It may be better to just bandage the wound and refer.

In an acute rape case (<72 hrs) AND if the patient gives written consent:

- Advise the victim **not to wash/shower/change clothes**. Forensic evidence (to show in a court of law) may need to be collected by a trained person.
- **Consider immediate referral to Mae Sot Hospital/ Myawaddy hospital** or another organisation that has had training in the management of gender based violence. Referral should be strongly encouraged for GBV survivors who are children.

2. **SAFETY**: Assess risk of further attack or suicide before they leave the clinic. Offer referral to safe house or short-term stay at the clinic.

3. **PSYCHOSOCIAL**: listen, be kind. Do not try to solve their problems. Offer information about organizations that can help. Always let the survivor decide.

4. **LEGAL/JUSTICE**: ask if the survivor has reported to the police, village elder or other authority. Give information and let them decide:

- **Forensic (DNA) evidence can only be taken <72 hrs after rape (at referral hospital)**. Explain that it may be good to take samples now even if they don't plan to report. They may change their mind later.
- Thai law only accepts cases reported within 3 months of the rape (except in some special cases) so encourage them to report quickly if they plan to report.
- **Reporting can be difficult**. Encourage them get help (e.g. site GBV team, local NGO) if they want to report.

KEY POINTS:
GBV survivors may be very upset and cry. This may make us uncomfortable.
The GBV survivor who is crying is having a normal reaction to an abnormal event.
DO NOT make the event seem normal: "It's not so bad, everything will be fine."
DO accept the survivor's feelings and make the feelings normal:
"You have a right to be upset and sad. It is okay to cry here. We can talk when you are ready."

5. **Referral: Discuss with the correct people** e.g. referral organizations police, village head, **only after written consent from the patient**.

Reasons to refer a survivor:

- Experienced physical or sexual violence
- Rape <72 hrs (best chance to get forensic/DNA evidence)
- Any physical injuries (bruising, cuts, genital injuries)
- Acting unusually (e.g. very nervous/frightened/not making eye contact)

- Any suicidal thoughts
- GBV is by close neighbour or family member (not safe at home)
- The perpetrator is still nearby or can find the survivor easily (not safe)
- The survivor is <18 (especially <15), very old, or developmental delay

Always remember the **4 GBV principles** when thinking about referral:
Health, Safety, Psychosocial Support and Justice.

GBV MANAGEMENT

If referral is not available, delayed, or if the survivor does not want to be referred, we must give immediate management and treatment. **Each case has different needs that we need to consider.**

ASSESSMENT

1. If the patient is not being referred immediately to a hospital with GBV services, do the following assessment: Go to a private and confidential room in the clinic where you can talk to the GBV survivor. Ask them where they would be comfortable talking (they may be afraid if you take them to a very isolated place).

2. First, establish a relationship by introducing yourself; explain confidentiality. Tell the patient everything that is going to happen during the interview and the examination. Ask if they would like to ask any questions – do they want someone with them during the assessment? Tell them you would like to write down the history and examination so that you can help them.

3. Explain that everything they say will be confidential **EXCEPT IF**:
   - They give consent to share the information with another person who will help them.
   - Someone is in serious danger- such as suicidal ideas or death threats.
   - It involves allegations of abuse against an NGO, UN staff or Thai Military.
   - The patient is a minor under 15 (or 18).

4. The interview should be done with kindness. Include **counselling techniques** (*see p.184*). Ask a few open-ended questions. LISTEN. Avoid questions beginning with "why" – they can make the patient feel blamed. Assess the degree of distress of the survivor. Is the survivor at risk of suicide?

Suicidal thoughts
If a patient tells you that they are thinking of killing themselves,
you must take this very seriously. Ask if they have specific plans to kill themselves.
If they do, do not let them leave the clinic until they have been seen by a supervisor/doctor.
If the patient has suicidal thoughts you CAN break confidentiality and inform another person,
even if it is against the person's wishes. *See p.187* for more detail.

MEDICAL TREATMENT AND DOCUMENTATION

It is very important to **document all findings clearly and completely** in words and diagrams.

A full examination including a genital examination **should only be done by a person trained in gender-based violence when possible.**

1. Physical Examination (if possible, this should be done by a person trained in GBV)

A physical examination should include:

- Vital signs (temperature, pulse, respiration and blood pressure) and pain assessment.
- Looking for any injuries that could be life threatening (that would need referral) or immediate treatment that is needed e.g. suturing a wound.
- Collection of DNA evidence (e.g. blood, semen, loose hair, skin swabs, dirt under the fingernails, fingernail clippings, clothing, full description trauma, photographs)
- Do a normal complete physical exam (e.g. listen to heart and lungs, palpate abdomen, look at any skin bruises or injuries). Avoid focusing only on the genital exam (especially in children).

Remember that a survivor could have suffered real physical violence and not have visible trauma. If you see physical injuries (e.g. bruises, cuts, fractures) this is a sign of **severe** and dangerous violence and is an **EMERGENCY**.

2. Give emergency medical treatment

Wounds and fractures: clean, suture and dress appropriately or refer to nearest hospital. Wounds at high risk for tetanus will need a tetanus booster.

3. Specific treatment for rape victims

Think about HIV, STI, Hepatitis, and pregnancy for all rape survivors. If it is less than 3-7 days after the rape, preventing pregnancy is still possible.

a. HIV prevention: start as soon as possible after the incident, best if within 1-2 hours, but not more than 72 hours after. After 72 hours from the incident it is too late for HIV prophylaxis. *See post exposure prophylaxis, p.10.* Every clinic needs one or two PEP packs ready to give to rape victims (Note: check the expiration date). Check baseline HIV test before giving PEP. If **positive**, do not give PEP: give post-test counselling and refer to HIV treatment program.

b. Hepatitis B: If the patient has not already been vaccinated, check for hepatitis B status and give immunisation with **hepatitis B vaccine** (HBV) as soon as possible if hepatitis B negative. Advise to finish the course. 1st dose: day 0 (as soon as possible), 2nd dose: 1 month, 3rd dose: 6 months.

c. Pregnancy prevention: Ask if she thinks she is pregnant already (before the rape). Is she using effective contraception (e.g. Implant, IUD, on time for depo)? Take a pregnancy test before giving emergency contraception (EC).

If pregnancy test **positive**: do not give her the pills if the rape was <14 days ago. Explain this means she was pregnant **before the rape occurred**.

If pregnancy test **negative** and not using effective contraception: treatment depends on time since rape

- **<120 hours (5 days)** since incident
  - IUD can be used as emergency contraception and is very effective
  - If you have access to a pack of **emergency contraception**, follow directions on the packet (either take all at once OR as 2 doses 12 hrs apart)
  - Use **combined oral contraceptive pill** with levonorgestrel: *See Figure 12.3*
  - If needed, give **metoclopramide** 10 mg PO 1 hour before any emergency contraception pills to prevent nausea and vomiting
- **≥120 hours (5 days) but ≤7 days** since incident: it is too late to use EC; explain that an IUD can help.
- **>7 days** of the incident: it is too late to prevent pregnancy. Check pregnancy test and follow-up.

d. STI prevention:

Ceftriaxone 250 mg IM STAT AND **Metronidazole** 2 g STAT
PLUS
Choose: **Azithromycin** 1g STAT OR **Doxycycline100** mg BID 7 days

Can give this now or later (e.g. wait until after PEP finished so less risk of side effects). If not given, counsel the patient to watch for signs and symptoms of STI and come to clinic immediately. Consider doing a swab for trichomonas and gonorrhoea but offer treatment even if negative if she wants.

4. **After prescribing all the necessary treatments review SAFETY**
   - Will the patient be safe when they leave the clinic?
   - Will someone try to hurt them when they leave the clinic?
   - Is there anyone else at home who is unsafe (e.g. brother or sister, child)?
   - If the patient does not feel safe, refer to an organisation that specialises in GBV. If necessary, allow short-term stay at the clinic. Remember staff safety as well.

FOLLOW UP

- If the patient/survivor is not being cared for by a GBV organisation, schedule a follow-up visit for 2 weeks, 1 month, and 3 months. Write the follow up visit in the lema so the patient does not forget.
- A patient can follow up sooner or more frequently.
- Follow the 4 GBV priorities at all follow up visits: **Health, Safety, Psychosocial Support and Justice**
  - Give emotional and psychosocial support, review safety, offer patient referral and support services
- **Pregnancy testing** for rape victims should be checked at 1 month and **HIV and VDRL testing** at 3 months. If no STI prevention drugs were taken an STI check may be necessary.

13.1 ACUTE ABDOMEN

DEFINITION

Any sudden, severe abdominal pain. There are 2 kinds of acute abdomen: non-surgical and surgical. Both kinds of acute abdomen are medical emergencies and need urgent management or immediate surgery (surgical abdomen).

CAUSES

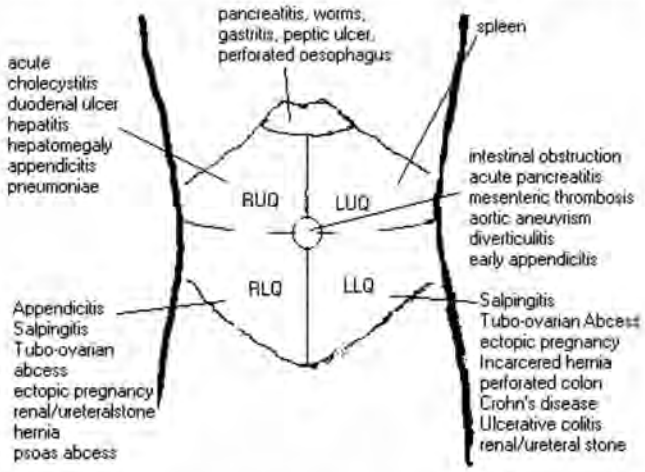


Figure 13.1 Differential diagnosis of abdominal pain by quadrant

CAUSES OF SURGICAL ABDOMEN

Peritonitis, appendicitis, cholecystitis, pancreatitis, intestinal perforation or obstruction, acute intestinal ischemia (e.g. thromboembolism), ruptured ectopic pregnancy, ovarian torsion. Renal stones, incarcerated hernia and cholangitis might also need an operation.

CAUSES OF NON-SURGICAL ABDOMEN

Pyelonephritis, worms, diverticulitis, painful menstruation, pelvic inflammatory disease (PID), peptic ulcer (without perforation), gynaecological or obstetric problems (e.g. endometriosis, uterine fibroids, menstruation) , hepatitis and dengue (abdominal pain is a warning sign).

SIGNS AND SYMPTOMS

Check the patient carefully before making a diagnosis and giving treatment. Some patients have non-specific symptoms. Examine the patient before giving pain medicine as analgesics (pain medicine) might cover symptoms and lead to the wrong diagnosis. If severe pain, analgesics may be needed to examine the patient. Examine young children when they are calm and quiet. Signs of shock may be present. Good history and examination are important to make the right diagnosis. If not sure, discuss with doctor.

1. **Surgical abdomen. This is an EMERGENCY. Careful: some patients do not have all symptoms**
   - Moderate or severe (cannot walk upright) abdominal pain
   - Hard, distended abdomen
   - Absent bowel sounds in 4 quadrants or tinkling (like metal) sounds
   - Guarding or rebound tenderness

2. **Non-surgical abdomen**
   - Moderate pain
   - Soft abdomen even if there is distension
   - Decreased or normal bowel sounds
   - No guarding or rebound

Appendicitis (severity 'AIR' score)

Vomiting	Yes=1		No=0
Pain in RLQ:	Yes=1		No=0
Rebound:	Mild=1	Mod=2	Severe=3
Neutrophils:	70-84%=1		≥85%=2
WBC:	10-<15x10^9/L=1		≥15.0x10^9/L=2
CRP:	10-49 mg/L=1		≥ 0 mg/L=2
Score 0-4:	not likely		DC and f/u
5-8:	not sure		Observe IPD
9-12:	very likely		Refer

TREATMENT

- If abdomen is non-surgical, treat the cause
- If the abdomen is surgical:
  - **DRS AB-CABDE/S** (*see p.27*)
  - Give nothing to eat or drink (NPO – nil per oral)
  - IV **ampicillin** AND IV **gentamicin** (OR **ceftriaxone**) AND IV **metronidazole**
  - IV fluids - **NSS**
  - **REFER THE PATIENT TO HOSPITAL IMMEDIATELY**

13.2 GASTRO-INTESTINAL BLEEDING

DEFINITION

Bleeding from the GI tract. Symptoms depend on where the blood is coming from. Bleeding can be chronic (cancer) or acute (variceal bleed).

CAUSES

Upper GI tract - stomach, oesophagus:
- Peptic ulcer disease
- Varices (portal hypertension from liver disease)
- Mucosal laceration (Mallory-Weiss Syndrome)
- Cancer

Lower GI tract – intestine, colon:
- Diverticulitis (pouches in wall of intestine)
- Cancer
- Inflammatory bowel disease
- Dysentery
- Haemorrhoids

SIGNS AND SYMPTOMS

- **Bleeding from the upper GI tract (UGI)**:
  - Vomit brown liquid (like coffee grounds) or fresh blood
  - Melaena (black, sticky, smelly stools).
  - Remember that patients taking iron tablets may have black stools.
- **Bleeding from the lower GI tract (LGI)**:
  - Dark (bleeding high in the intestines) or bright red (bleeding is lower) blood from rectum.
- May have signs of shock – tachycardia, low BP, increased CRT, fast RR, cold peripheries.
- Bleeding from some causes e.g. peptic ulcer disease may occur slowly and be more chronic

TREATMENT

- No food or drink (NPO)
- **REFER TO HOSPITAL: Severe bleeding is an emergency; patients can become unwell very quickly**

EMERGENCY TREATMENT FOR ACUTE BLEEDING

Note**: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 13.2 DRS ABCDE chart for GI bleeding

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **GI BLEEDING**	
DRS	Danger Response Send for help	Gloves Safe place Call for help	
A	Airway obstruction Speaking, stridor, swelling, secretions	**Suction** (if available)	
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	Oxygen	
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**2 IV cannulas** (biggest size possible 16G or 18G) Take bloods e.g. **Hct, blood group, BUN (high), CBC, MS, dextrose** etc. **Fluid bolus 1L STAT** **Blood transfusion** if signs of shock	
D	Check dextrose Seizures Pain	If UGI bleeding and suspect **PEPTIC ULCER DISEASE** (e.g. h/o abdominal pain, no risk factors for liver disease): **Omeprazole** 40mg IV (or PO) OR **Ranitidine** 50mg IV (if available) **AVOID** NSAIDs (e.g. aspirin, ibuprofen, diclofenac) in UGI bleeding	If suspect **PORTAL HYPERTENSION** (e.g. alcoholism, Hep B or C, cirrhosis) discuss with the doctor and consider: **Ceftriaxone** IV 1g OD for 5-7 days (varices may be associated with bacterial infection) **Vitamin K** IM 2.5-10mg STAT dose (to stop bleeding)
E	AVPU/GCS Expose and examine	History, further investigations, treatment plan	
DISCUSS WITH DOCTOR			
ASSESS RESPONSE – continue cycle with CABDE/S assessment			

This patient needs referral to hospital: it is very important to make the patient as stable as possible (using DRS AB-CABDE/S) before you transport them to hospital

13.3 EPIGASTRIC PAIN

Epigastric pain is a very common complaint. Possible causes are:

13.3.1. GASTRO-OESOPHAGEAL REFLUX DISEASE

DEFINITION

Gastro-oesophageal reflux disease (GORD) is caused by a weak sphincter (muscle) between the oesophagus and the stomach. Acid from the stomach can flow back into the oesophagus causing a burning pain.

RISK FACTORS

- High alcohol intake
- Obesity
- Eating spicy food, chocolate
- High caffeine intake
- Heavy smoking
- Pregnancy
- Drugs e.g. NSAIDs, steroids and doxycycline

SIGNS AND SYMPTOMS

Burning pain in the epigastric or chest area moving to the mouth, acid taste, especially when lying down. Chronic cough (less common). Long-term GORD can cause oesophageal cancer (Barrett's oesophagus).

DIAGNOSIS

Clinical diagnosis.

TREATMENT

Lifestyle advice:

- Stop (or at least reduce): alcohol, smoking, spicy food, chocolate, hot drinks, tea and coffee.
- Avoid eating 3 hrs before bedtime; eat small meals but more frequently, do not lie down after meals.
- Advise overweight patients to lose weight, reduce fatty foods.
- If possible, avoid medications that can cause GORD.

Medications:

- *See Treatment algorithm for gastritis and epigastric pain, Figure 13.14, p.103.*

PREVENTION

Lifestyle advice (same as for treatment)

13.3.2. GASTRITIS*UPDATE

DEFINITION

Gastritis is an inflammation of the stomach mucosa (the inner surface of the stomach).

CAUSES

- Helicobacter pylori (H. pylori) bacteria in the stomach
- High alcohol intake
- Drugs: NSAIDs, steroids high dose, ferrous sulphate. Especially prolonged use is a risk factor
- Heavy smoking
- Eating spicy food
- Autoimmune (can cause pernicious anaemia)

SIGNS AND SYMPTOMS

- Pain in the epigastric area (burning pain, dull pain).
- Nausea, vomiting, bloating, belching, feeling of fullness, weight loss.
- Anemia in autoimmune gastritis (decreased HCT, increased MCV and MCH)

DIAGNOSIS

Clinical diagnosis, CBC in autoimmune gastritis.
If vomiting with blood: *see Figure 13.1, p.100* for gastrointestinal emergencies.

TREATMENT

Lifestyle advice:

- Stop (or at least reduce): alcohol, smoking, spicy food, hot drinks, tea and coffee.
- Advise overweight patients to lose weight, reduce fatty foods.
- If possible, avoid medications that can cause gastritis.

Medications:

- *See Figure 13.14 Treatment algorithm for gastritis and epigastric pain, p.98.*

PREVENTION

Avoid coffee, alcohol, eating spicy foods, smoking. Avoid chronic medications that cause gastritis e.g. steroids or NSAIDs like ibuprofen. If chronic medication is absolutely necessary (e.g. steroids for nephrotic syndrome) consider **omeprazole** 20mg OD prophylaxis to prevent gastritis.

13.3.3 PEPTIC ULCER DISEASE

DEFINITION

In peptic ulcer disease, epigastric pain can be very severe. Ulcers can be in the stomach (gastric ulcer) or in the duodenum (duodenal ulcer). Often peptic ulcers are caused by infection with bacteria called *H. pylori*. Medicines that decrease stomach acid like aluminium hydroxide may make you feel better, but the ulcer may come back.

SIGNS AND SYMPTOMS

- Burning pain in the epigastric area:
  - **Gastric ulcer**: pain worse with food
  - **Duodenal ulcer**: worse before meals and in the morning (empty stomach). Pain may improve with eating but comes back 1-2 hours after a meal.
- Nausea vomiting, bloating, loss of appetite
- Weakness and fatigue due to chronic blood loss.

COMPLICATIONS

- **Acute bleeding**: In some cases, acute bleeding can happen. The patient will vomit brown liquid (like coffee ground) or fresh (bright red) blood and may have melaena (black sticky smelly stools). *See Figure 13.2 for emergency treatment.*
- **Chronic bleeding**: if a little bleeding occurs over a long time, then the patient will become anaemic.
- **Perforation**: hole in the stomach wall or the duodenum which can lead to peritonitis (hard, very tender abdomen), sepsis and death.
  - **DRS AB-CABDE/S**
  - Give nothing to eat or drink (**NPO**)
  - IV **ampicillin**+ IV **gentamicin** + IV **metronidazole**
  - IV fluids – **NSS**

REFER THE PATIENT TO HOSPITAL IMMEDIATELY if suspect perforation

DIAGNOSIS

It is a clinical diagnosis. Examine abdomen to check for any pain/masses. Look for signs of anaemia. If possible, test for *H. pylori*. Consider other causes: gallstones, liver disease.

TREATMENT

When giving treatment it is important to do ALL the steps, not just give medication:

1. Lifestyle advice
2. Stop any medications that make symptoms worse
3. Consider de-worming, check stool test.
4. Try step by step treatment. *See Figure 13.4, next page.*

PREVENTION

Avoid coffee, alcohol, eating spicy foods, smoking. Avoid chronic medications that may cause peptic ulcer disease (e.g. NSAIDs). If chronic medication absolutely necessary e.g. steroids for nephrotic syndrome, consider **omeprazole** 20mg OD prophylaxis.

Figure 13.3 Helicobacter pylori description and treatment

***Helicobacter pylori (H. pylori)*:**

H. pylori is a bacterium that is found in many people's stomachs. This bacterium is able to survive the highly acidic environment in the stomach. Most people do not know they have the infection, and it often it does not cause any problems. Sometimes it causes gastritis or ulcers. It is not known why and when people become infected. It has also been linked to stomach cancer. Testing for *H pylori* can be done by serology, a breathing or a stool test. These tests are expensive and not routinely available at most clinics on the border.

Since the source of *H. pylori* is not yet known, recommendations for avoiding infection have not been made. In general, it is always wise for persons to wash hands thoroughly, to eat food that has been properly prepared, and to drink water from a safe, clean source.

If symptoms do not improve with medical management, try to treat for H. pylori.

Omeprazole 20mg BID for 10 days AND
Metronidazole 500mg TID for 10 days AND
Amoxicillin 500mg TID for 10 days
Then continue **Omeprazole** 20mg OD for 2 weeks

Note: *H pylori* may be resistant to antibiotics, so even if these medications are given the bacteria may not be cleared and the patient may not improve. Longer treatment duration (e.g. 14 days) might improve outcome.

Figure 13.4 Treatment algorithm for gastritis and epigastric pain*update

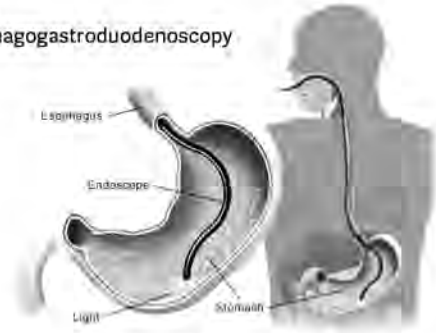
History of epigastric pain and acid reflux ≥1 week
(if pregnant refer to Obstetric Guidelines)

DANGER SIGNS
Gastrointestinal bleeding
Weight loss without a cause
Difficult or pain when swallowing
Persistent vomiting
Palpable mass or lymphadenopathy
Family history of gastrointestinal cancer

Consider referral for of epigastric pain.
EGD is needed.

1. **Stop any medications** that can cause symptoms
   a. Calcium channel blockers (amlodipine, nifedipine)
   b. Nitrates
   c. Theophylline, aminophylline
   d. Steroids
   e. NSAIDS
   f. Aspirin
2. **De-worm**
3. **Lifestyle** advice
   a. Decrease weight if overweight
   b. Stop smoking and alcohol
   c. Decrease fatty foods
   d. Eat before bedtime > 3 hours
   e. Avoid spicy food, caffeine (coffee, tea)
4. Start **Omeprazole** 20-40mg OD

EGD
Esophagogastroduodenoscopy



https://med.mahidol.ac.th/giendoscopy_center/th/egd

Continue Omeprazole for 4-8 weeks

Improved? → Yes → STOP Omeprazole

No

Give **H. pylori treatment** (*see Figure 13.3*)

Improved? → Yes → Follow up if have epigastric pain again

No

Consider:

Domperidone 10-20mg TID (prokinetic drug – makes intestines move forward more)

Counseling for depression/anxiety or **Amitriptyline** 10-25 mg HS (taking amitriptyline can improve epigastric pain in some cases, and it also decrease stress, depression or anxiety)

If the pain does not improve, comes back again and again, or getting worse, there could be another problem like cancer (*see section 13.3.6, p.104*) or *H. pylori* resistance to antibiotics (*see Figure 13.3, p.102*).

13.3.4. WORMS

Worms often give epigastric and/or abdominal pain in children and adults.

Check stool sample and treat all epigastric pain with a course of **mebendazole** or **albendazole**.
(Not in children < 1 year or pregnant women in first trimester).

13.3.5. ANXIETY

Feeling nervous or stressed person can cause epigastric pain. Take a good medical and social history. **You need to rule out other causes of abdominal pain before considering anxiety as the diagnosis.**

13.3.6. STOMACH CANCER

- Chronic or recurrent **epigastric pain** (sometimes not responding to treatment)
- Weight loss, loss of appetite, weakness and fatigue
- More than 60 years old is a higher risk group
- A large lymph node above the left clavicle is a sign of cancer of the stomach.
- Treatment is chemotherapy with cancer drugs, but this is only available at high level hospitals. If cancer treatment is not available, you can provide palliative care.

13.4 DIARRHOEA

Start SURVEILLANCE
DEPENDING ON NUMBERS
see Appendix 7

DEFINITION

Diarrhoea is a symptom and not a disease.

Use the ISOLATION protocol for diarrhoea patients. (*see p.8*)

Acute diarrhoea = an increase in the number (>3/day) AND loose or watery stools passed over a period of less than 14 days. Acute diarrhoea can have many different causes (gastrointestinal infection, food poisoning, surgical problems, allergy, food intolerance or other diseases).

Chronic diarrhoea = A diarrhoeal episode that lasts more than 2 weeks. Possible causes are inflammatory bowel disease, hyperthyroidism, cancer, abuse of laxatives, gastrointestinal tuberculosis. (**Note**: causes and treatments for chronic diarrhoea are different than for acute diarrhoea).

Two types of acute diarrhoea are described: (mixed syndromes can occur)

1. DIARRHOEA WITHOUT BLOOD, *see p.109*
Stools are very liquid (watery diarrhoea), many stools, and clear colour (brown, yellowish). There may be fever and abdominal pain but there is no blood or mucus in stools. The cause can be viral, bacterial (e.g. *Cholera, Salmonella* non-typhoid), some *E. coli* strains) or parasitic (e.g. *Giardia, Cryptosporidium*).

Acute diarrhoea without blood can also be seen in malaria or systemic allergic reactions.

2. DYSENTERIC DIARRHOEA - DIARRHOEA WITH BLOOD, *see p.109*
Stools are soft rather than liquid and are with blood. There is abdominal pain and fever can be high. Most common causes are *Shigella, Campylobacter,* some *E. coli* strains. Parasites (e.g. *Entamoeba histolytica*) can also cause dysentery (usually without high fever).

SIGNS AND SYMPTOMS

- How many days has the patient had diarrhoea? How many times per day?
- Is it watery or with blood?
- Is there abdominal pain, rectal pain, tenesmus (feeling need to pass stool), fever or vomiting?

Figure 13.5 Signs of acute diarrhoea

	DIARRHOEA WITHOUT BLOOD	DYSENTERIC DIARRHOEA
Signs	Sometimes fever, slight abdominal pain, vomiting	High fever Moderate to severe abdominal pain, vomiting
Stools	Watery	With blood
Life-threatening	Dehydration	Sepsis

DIAGNOSIS

It is most important to evaluate and treat dehydration. Diagnosis is clinical. To specify between viral, bacterial or amoebic disease you need to do a **stool test**. Consider the next points:

- For all types: First evaluate the **signs of dehydration** (*see below*).
- If there is **fever** you must also think of concurrent ("other") diseases such as malaria, otitis media, pneumonia, meningitis or UTI.
- If signs of purging (very large volume) watery diarrhoea or repeated vomiting, think of *Cholera.*
- If the patient has **abdominal signs**: a tender abdomen or abdominal distension, think of surgical causes (e.g. obstruction or perforation).
- With **chronic diarrhoea** (>2 weeks) check for malnutrition and chronic diseases e.g. HIV.

TREATMENT

Follow these steps to safely diagnose and treat diarrhoea:

1. Assess acute or chronic
2. Evaluate hydration status using the WHO criteria.
3. Choose a treatment according to the WHO criteria.
4. Recognise the syndrome: diarrhoea without blood or with blood (dysentery).
5. Consider causes of diarrhoea and if any antibiotics are needed.

Below are more detail about each stage of management:

1. Assess acute or chronic
- As per definition above.

2. Evaluate hydration using the WHO criteria
- Diarrhoea (mainly diarrhoea without blood) can lead to severe dehydration (especially in children).
- First assess your patient for signs of dehydration.

Figure 13.6 Clinical signs for evaluating dehydration (WHO plan)

	Plan A: **No Dehydration**	**Plan B:** **Mild Dehydration** **2 or more of:**	**Plan C:** **Severe Dehydration** **2 or more of:**
General conditions	Normal	Agitated	Very tired or unconscious
Eyes	Normal	Slightly sunken	Deeply sunken
Tears	Present	Absent	Absent
Mouth and Tongue	Moist	Dry	Very dry
Thirsty	None	Yes	Not able to drink (too weak to express the need)
Skin pinch	Goes back normally (quickly)	Goes back slowly	Goes back very slowly

3. Choose a treatment according to the WHO criteria:

The decision on whether to admit and how to treat the patient is dependent on the WHO classification A, B or C. Once evaluating the level of dehydration then follow the treatment:

Figure 13.7 WHO Plan A for deyhdration

WHO PLAN A

To treat diarrhoea at home and prevent dehydration

(SEE APPENDIX 8, FOR ORS/RICE WATER)

The patient has **no signs of dehydration.** No need to admit to IPD.

Rules of home treatment:

GIVE EXTRA FLUID

How much?

- After each loose stool give:
  - Child < 2 yrs: 50-100ml (quarter of a large cup)
  - Child 2-10 yrs: 100-200ml (half of a large cup)
  - Older child and adults: give patient enough ORS for at least 2 litre

What fluid to give?

- **Oral Rehydration Solution (ORS)**.
  You can also give salted rice water, salted yoghurt drink or vegetable/ chicken soup with salt
  Be careful, too much salt can make dehydration worse ("osmotic dehydration")
- Do not give fluids e.g. carbonated (fizzy) drinks, commercial fruit juices, sweetened tea, tea or coffee

How to give?

- Give frequent, small sips from a cup
- If there is vomiting, wait 10 minutes then continue more slowly
- Continue to give extra fluids until the diarrhoea stops.

ZINC

Zinc sulphate Child <6m: 10mg OD; Child 6m-5yrs: 20mg OD for 10-14 days. (1 tablet = 15mg)
Note: no benefit to give if child >5yrs so DO NOT GIVE.

- Infants: dissolve tablet in a small amount of expressed breast milk, ORS or clean water; in a spoon
- Older children: chew tablets or dissolve in a small amount of clean water in a cup or spoon

Remind the mother to give the zinc supplements for **10-14 days**.

CONTINUE FEEDING

Continue to feed normal diet, and increase breast feeding:

- **Infants who are not breastfeeding**: continue usual milk formula at least every 3 hours (if possible, by cup)
- **Infants who are less than 6 months who are being breastfed and given extra food** should try to increase breastfeeding (more times and for longer each feed) and decrease the food (ideally to **exclusive breastfeeding**)
- **Children older than 6 months** that are not taking soft food should be given cereals (or bread, rice) and vegetables in addition to milk. Educate the parents about giving solid foods

Recommend food rich in potassium as this can be lost in the diarrhoea/vomiting e.g. banana, green coconut water, fresh fruit juice, tomatoes.

ADVISE WHEN TO COME BACK

You should tell the family/patient that they should return if:

- Pass many watery stools
- Is very thirsty
- Blood in stool
- Vomits a lot
- Not better after 3 days
- Has a fever
- Does not eat or drink normally.

Figure 13.8 WHO Plan B for dehydration

WHO PLAN B

To treat dehydration

(SEE APPENDIX 8 FOR ORS/RICE WATER)

The patient has **signs of dehydration** (*see Figure 13.6, p.105*). Needs to be admitted to IPD.

REHYDRATE

Give ORS in the first 4 hours according to the table below.
Vomiting is very common especially in the first 1-2 hours: **if the child vomits wait 5-10 minutes and try again more slowly (small but frequent amounts of fluid) – do not go straight to IV fluids because of vomiting**:

WHO Guidelines approximate amount of ORS to give in first 4 hours

** Use age if you cannot get weight**

Weight	**< 5kg**	**5-7.9kg**	**8-10.9kg**	**11-15.9kg**	**16-29.9kg**	**30kg or more**
Age**	<4 months	4-11 months	12-23 months	2-4 years	5-14 years	15 years +
ORS	200-400ml	400-600ml	600-800ml	800-1200ml	1200-2200ml	2200-4000ml
Note: If patient wants more ORS then give them more						

REASSESS

Assess for signs of dehydration **every 1 hour**. If signs of dehydration get worse and the child develops signs of severe dehydration e.g. very tired or unconscious, deeply sunken eyes, not able to drink treat for severe dehydration (Plan C).
After **4 hours** reassess using Figure 13.6 then decide what treatment plan to continue:

- No signs of dehydration → plan A
- Some dehydration → plan B AND **offer food, milk and other fluids (as above)**
- Worsening dehydration → plan C

ZINC

Zinc sulphate Child <6m: 10mg OD; Child 6m-5yrs: 20mg OD for 10-14 days.
Note: no benefit to give if child >5yrs so DO NOT GIVE.

- Infants: dissolve tablet in a small amount of expressed breast milk, ORS or clean water; in a spoon
- Older children: chew tablets or dissolve in a small amount of clean water in a cup or spoon

Remind the mother to give the zinc supplements for the **full 10-14 days**.

FEEDING

- Solid food should not be given in the first four hours (except breastfeeding)
- After 4 hours if plan B or plan A is continued, give food every 3-4 hours (as per plan A feeding)
- If change to treatment plan A children >6m should have some food before they are discharged

Figure 13.9 WHO Plan C for deyhdration

WHO PLAN C

****EMERGENCY** to treat severe dehydration:**

DRS AB-CABDE/S emergency approach, *see p.16*. Needs admission to IPD

REHYDRATE

Give **IV hydration** with **Ringers Lactate**[a]:

WHO Recommendations how much IV Ringers Lactate fluid to give				
	Whilst waiting for IV access	**First give 30ml/kg in:**	**Then give 70ml/kg in:** (or use SMRU IVF chart[b])	**Re-assess dehydration** (*Figure 13.6*)
Infants under 12 months	Give ORS	1 hour	5 hours	6 hours
Older than 12 months	Give ORS	30 minutes	2 ½ hours	3 hours
How to calculate drop rate	$Drops/_{Minute} = \frac{ml}{hour} \times \frac{drops\ per\ 1\ ml^*}{60}$		Giving sets: No set*: 1 ml = 20 drops Metroset* (burette): 1 ml = 60 drops Blood set*: 1 ml = 15 drops	

Example I

You want to give 500 ml in 5 hours with Metroset:

$$Drops/_{Min} = \frac{500}{5} \times \frac{60^*}{60} = 100\ drops/\ min$$

Example II

You want to give 500 ml in 5 hours without set:

$$Drops/_{Min} = \frac{500}{5} \times \frac{20^*}{60} = 33\ drops/\ min$$

If cannot get IV access, give ORS by nasogastric tube (NG tube): 20ml/kg/hr for 6 hours. Check clinical condition as for IV infusion. Continue to try for IV access, it will become easier as the patient becomes more hydrated.

Also give ORS (approx. 5ml/kg/hour) as soon as the patient can drink (usually after 3-4hrs (infants) or 1-2 hrs (children)).

REASSESS

Do vital signs every 15 minutes initially.

After 1-2 hours: if IV hydration is not improving then increase the rate of the fluid.

After 3 hours (children/adults) and **6 hours (infants)** re-assess according to Figure 13.6:

- No signs of dehydration → plan A (observe the child for at least 6 hours)
- Some dehydration → plan B (stop IV fluid and give ORS)
- Worsening dehydration → plan C again

ZINC

Zinc sulphate Child <6m: 10mg OD; Child 6m-5yrs: 20mg OD for 10-14 days.

Note: no benefit to give if child >5yrs so DO NOT GIVE.

- Infants: dissolve tablet in a small amount of expressed breast milk, ORS or clean water; in a spoon
- Older children: chew tablets or dissolve in a small amount of clean water in a cup or spoon
- Remind the mother to give the zinc supplements for the **full 10-14 days**

FEEDING

- Should not be given until at least the first re-assessment (except for breastfeeding)
- If continuing on plan B or plan A give food every 3-4 hours as described above
- If change to treatment plan A, children >6m should have some food before they are discharged

[a] Use a Metroset (burette) if the patient is <15kg and the IVF bag is 500ml. If a small child receives a large amount of IV fluid suddenly, it may cause sudden pulmonary oedema.

[b] *See Appendix 9* for an IVF chart that can be used for giving maintenance IVF.

1. DIARRHOEA WITHOUT BLOOD

- Most patients with watery diarrhoea do NOT need antibiotics
- REHYDRATION is the most important treatment
- Check the stool sample as some intestinal parasites can cause diarrhoea (e.g. *Giardia intestinalis*)

Most cases of acute diarrhoea without blood do not need antibiotic treatment. However, there are (at least) two special cases of watery diarrhoea that do need antibiotics.

Cholera: In cases of acute fulminant watery diarrhoea ('rice-water stools') consider cholera. *Cholera* should be suspected when a child older than 5 years, or an adult, develops severe dehydration from acute watery diarrhoea (usually with vomiting), or if any patient older than 2 years has acute watery diarrhoea when cholera is known to be present in the area.

Giardia : This diarrhoea is caused by the protozoa *Giardia intestinalis*. In most cases, there are only few clinical signs: nausea, abdominal pain, weight loss, (watery) diarrhoea. There is no fever. If the diarrhoea becomes chronic (>14 days): treat with ***metronidazole*** or tinidazole (at SMRU use **tinidazole**, *see Figure 13.14 Worm treatment table, p.122*).

2. DIARRHOEA WITH BLOOD (DYSENTERY)

- If possible, a **stool sample** should be done
- There are two types of dysentery:

Bacterial:
- Several types of bacteria cause dysentery, the most severe form is *Shigella*
- Associated symptoms: fever, abdominal pain, tenesmus (feeling of constantly needing to pass stools), unwell patient

Amoebic:
- Often not acute illness, less than 30% of sufferers have fever. Sometimes the amoebae migrate via the blood and cause abscesses (e.g. liver)

It can be difficult to know difference between amoebic and bacterial diarrhoea without a microscopic stool investigation (if a stool culture is needed discuss with the micro lab if a stool sample can be sent). Choose the treatment according to patient's symptoms (especially presence of fever and if patient is at risk):

ADULT PATIENTS AT RISK

- Patient over 65 years old with no support at home to help them
- Malnourished
- High fever >39°C
- Signs of severe dehydration
- Signs of confusion, seizures or coma

1. NO FEVER – (more likely amoebic)

- Admit to IPD if the patient is **at risk**. If possible, isolate the patient (*see p.8, Isolation guidelines*)
- Prescribe **metronidazole** PO x 5-10 days (10 days if amoebic liver abscess):
  - Adult: 750mg TID
  - Child: 15mg/kg TID
  - **Note**: Metronidazole doses for amoeba are higher than usual. Use the dose given here

2. FEVER

- Admit to IPD if patient is **at risk**. If possible, isolate the patient (*see p.8, Isolation guidelines*)
- Treat the fever with paracetamol, treat/prevent dehydration
- Use antibiotics with caution as in some infections (e.g. enterohemorrhagic *E. coli*), antibiotic use can lead to endotoxin release from dying bacteria.
- If condition requires antibiotics, give **ciprofloxacin** PO x 3-5 days. Can stop after 3 days if better.
  - Adults: 500mg BID
  - Child >1m 15mg/kg BID
- **Note**: if pregnant (ciprofloxacin contraindicated) give **ceftriaxone** IV 1g OD for 3-5 days
- If not better give **metronidazole** (dose as above)
- Ensure sufficient food intake of normal diet

MANAGEMENT

1. Watch for complications of abdominal distension, perforation, and sepsis.
2. For all diarrhoea do a stool-test to try to differentiate between amoebic and bacterial diarrhoea. If stool test is negative it does not mean there is no amoeba, sometimes it is difficult to find with a microscope. When there is an increased number of cases of diarrhoea, take stool samples for laboratory analysis (culture and sensitivity) if possible, inform the doctor and prepare for an outbreak of dysentery.

PREVENTION

Give the following education to all patients to prevent diarrhoea:

- Wash hands with soap and water before eating, preparing food and after visiting the toilet
- Breastfeed babies (exclusive breast feeding if <6m)
- Boil drinking water if not chlorinated (some parasites (e.g. *Cyclospora*) are resistant to chlorination)
- Cook food well and keep it covered
- Use toilets. Clean carefully after passing stools
- Do not use chronic antacid (like aluminium, omeprazole); gastric acidity helps to kill bacteria

COMPLICATIONS

Septicaemia, acute abdomen, amoebic liver abscess and haemolytic uremic syndrome (HUS - anaemia, low platelets and acute renal failure which can be caused by some *E. coli* strains).

13.5 CHOLERA

Cholera is very infectious – if suspect a case then use safety precautions and refer to hospital. (*see p.8, Isolation guidelines*)

DEFINITION

Cholera is an intestinal infection caused by the bacterium *Vibrio cholerae*. This bacterium produces Cholera Toxin (CT), an enterotoxin which causes a massive outpouring of fluid and salts (electrolytes) into the bowel. Cholera infection is transmitted through contaminated water or food.

Suspect cholera when a child >5 yrs or an adult, develops severe dehydration from acute watery diarrhoea (usually with vomiting), or if any patient >2 yrs has acute watery diarrhoea and cholera is known to be present in the area.

SIGNS AND SYMPTOMS

- Infections range from asymptomatic to acute fulminant watery diarrhoea, described as **'rice-water stools'**
- In severe cases, purging watery diarrhoea can rapidly cause the loss of 10% or more of the body's weight, with hypovolemic shock, metabolic acidosis and potassium loss causing death
- Vomiting starts after the onset of (always painless) diarrhoea
- 75% or more of initial infections with *V. cholerae* are asymptomatic, depending on the infecting dose
- People with blood type O are more likely to develop severe cholera than those with other blood types

DIAGNOSIS

Diagnosis is made clinically. In outbreaks, in non-epidemic situations a stool-sample test for *V. cholera* can be done. Because cholera is very contagious, refer the suspect case to a hospital that can manage cholera.

TREATMENT

If suspect cholera – put in IV line, give **Ringers Lactate 1L STAT** and refer to hospital immediately

If patient cannot be referred to a hospital, then follow these steps:

- Rapid replacement of fluid and electrolytes with oral or IV rehydration. A patient needs 10-15 litres of fluid the first day. In severely dehydrated patients give IV 50-100ml/kg/hr.
- Use Ringers Lactate. Replace potassium after 24h of IVF. Check potassium and blood glucose. If low potassium, add KCl (20-40mmol KCl) in 1 litre Ringers Lactate. *See electrolyte abnormality p.63.*
- Use antibiotics for severely dehydrated patients 2 years or older.
- Many antibiotics are recommended by WHO (doxycycline, tetracycline, trimethoprim-sulfamethoxazole, erythromycin, chloramphenicol or ciprofloxacin). There are resistant bacteria in different parts of the world. Here, you should use **ciprofloxacin** 1 gram STAT dose. You should check for resistance in your clinic before starting treatment, but this may not be possible.

If cannot refer it is VERY important to **take precautions to avoid the spread of cholera**:
Isolate patients in a separate area/room
Make a hole in the bed so the stool falls into a chlorinated bucket
Make sure you wear protective equipment (*see p.8 for Isolation precautions*)

PREVENTION
- Use clean water for hand-washing and for cooking
- Avoid uncooked seafood
- Be careful when eating leftovers of rice because cholera can grow easily in old rice

VACCINE
- There are vaccines for short-term protection (6 months). They should be given in case of an outbreak situation

13.6 LIVER DISEASES

13.6.1. LIVER FUNCTION TESTS (LFTS)*NEW

Liver function tests (LFTs) can be used to help diagnose liver disease. They can also help you distinguish between different types of liver diseases. There are many causes for abnormal LFTs but here is an overall explanation:

Figure 13.10 Liver enzymes and causes of abnormal values*new

LIVER ENZYMES	FUNCTION	CAUSES
AST/ALT	Enzymes produced by the liver that get released in the blood when the liver is damaged.	**High if**: Problem with liver cells e.g. hepatitis, toxins, cirrhosis, cancer, some drugs, cardiac failure.
ALP	Found in high amounts in the liver, bone and placenta. The normal range depends on the patients age.	**High if:** Cholestasis (decreased bile flow, e.g. obstruction with gallstones). Bone e.g. fracture, tumour, growing bones in children. Kidney failure Pregnancy
GGT	Produced with diseases of liver, pancreas and biliary tract i.e. gallbladder.	**High if**: Cholestasis, cholecystitis, hepatitis, cancer and alcohol excess. If GGT high and ALP also high helps to say it is liver problem rather than bone problem
Albumin	Major blood protein in the body that is produced in the liver.	**Low if**: Malnutrition, chronic liver disease, nephrotic syndrome, gastro-intestinal loss, burns
Bilirubin	Comes from RBC degradation. The liver 'conjugates' the bilirubin to *direct* bilirubin. Direct bilirubin is water soluble and can be excreted with stool/urine. An increase in bilirubin is called *icterus* and presents as jaundice.	
Unconjugated (indirect) bilirubin	Bilirubin that is not *conjugated*. If indirect bilirubin is >80% of total bilirubin, think of of pre-hepatic icterus.	**High if**: Haemolysis e.g. G6PD, drug reaction
Conjugated (direct) bilirubin	Bilirubin that is not conjugated by the liver. If direct bilirubin is elevated, the liver can conjugate bilirubin but there is a problem with excretion.	Liver problems (e.g. hepatitis) or blocked bile ducts (e.g. gallstones, congenital bile duct problem, pancreatic cancer)

13.6.2. HEPATITIS

DEFINITION

Hepatitis is an inflammation of the liver. It has many causes, but the commonest on the Thai-Myanmar border is viral hepatitis.

Hepatitis can be:
Acute e.g. hepatitis A or drug reactions (most will improve if the drug is stopped).
Acute or chronic e.g. hepatitis B: may be acute if the body's immune system manages to fight the virus (then become immune and cannot get infected again), or may become chronic and lead to liver cirrhosis (see below).
Chronic e.g. autoimmune hepatitis: will get worse over time.

CAUSES

1. **Viral Infection:**

Figure 13.11 Viral hepatitis (A, B, C, E)

	Transmission	Length of infection	Treatment	Complication
Hepatitis A	Faeco-oral e.g. poor hygiene	Acute, usually self-limiting	Supportive	Severe illness if pregnant
Hepatitis B	Contact with infected blood or body fluids, mother to child, sexual intercourse	Acute or chronic: 5% of adults infected will become chronic 95% neonates infected will become chronic	Antiviral drugs (may not be available). *See OB guidelines* for peri-natal prevention	Liver cirrhosis Liver cancer Associated with Hepatitis D infection
Hepatitis C	Contact with infected blood, congenital	Often chronic	Antiviral drugs (may not be available)	Liver cirrhosis Liver cancer
Hepatitis E	Faeco-oral	Acute, usually self-limiting	Supportive	Severe illness in pregnancy possible

2. **Parasitic** (e.g. Liver flukes, *E. histolytica*, malaria)
3. **Metabolic syndrome** (non-alcoholic liver disease)
4. **Drugs**: e.g. anti-TB drugs, HIV drugs, leprosy drugs, paracetamol (dose-dependent)
5. **Alcoholic hepatitis**
6. **Autoimmune hepatitis**

SIGNS AND SYMPTOMS

- Jaundice
- Malaise (fatigue, tiredness)
- Mild fever
- Loss of appetite
- Nausea and vomiting
- Right upper quadrant pain
- Smooth, tender and slightly enlarged liver
- Dark urine, stools not pale

Viral hepatitis infection can cause different symptoms in each patient. Some patients will have moderate symptoms (e.g. fatigue) and other patients may have severe liver disease.

DIAGNOSIS

- Liver function test (AST and/or ALT raised >1000U/L)
- Hepatitis B testing (*see below*)
- Liver ultrasound

Interpretation of Hepatitis B results:
For definitions e.g. antibody/antigen *see Figure 13.12, next page*.
Note: In some settings it is not usually needed to check all of these tests (often only HBsAg +/- HBeAg are tested). Sometimes only the rapid test for HBsAg is available.

HBsAg (Hepatitis B surface antigen)
- Protein on the surface of the hepatitis B virus which is present during acute or chronic infection
- Means that the person is infectious e.g. can pass the infection on to someone else

Anti-HBs (antibody against hepatitis B surface antigen)
- Antibody that is formed when the immune system fights the hepatitis B virus
- If positive, immunity developed either from an infection of hepatitis B or from the vaccine

HBcAg (Hepatitis B core antigen)
- Protein inside the hepatitis B virus
- Means that the virus is replicating e.g. making copies of the virus and that the patient is infectious

IgM anti-HBc (IgM antibody against hepatitis B core antigen)
- Antibodies against hepatitis B core antigen when the symptoms begin in acute hepatitis B
- Means recent or new infection, or exacerbation of chronic infection

Anti-HBc (IgG antibody against hepatitis B core antigen)
- Antibodies that stay positive for life
- Means that the patient has an acute ongoing infection or had a previous infection.

HBeAg (Hepatitis B e antigen)
- Similar to hepatitis core antigen
- Means that the patient is **very infectious**

Figure 13.12 Hep B viral markers

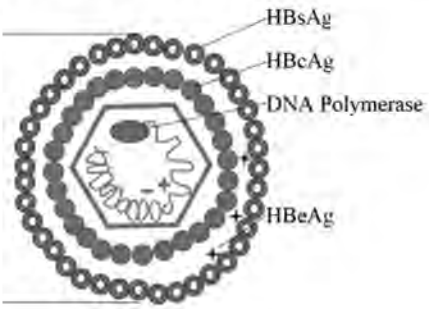
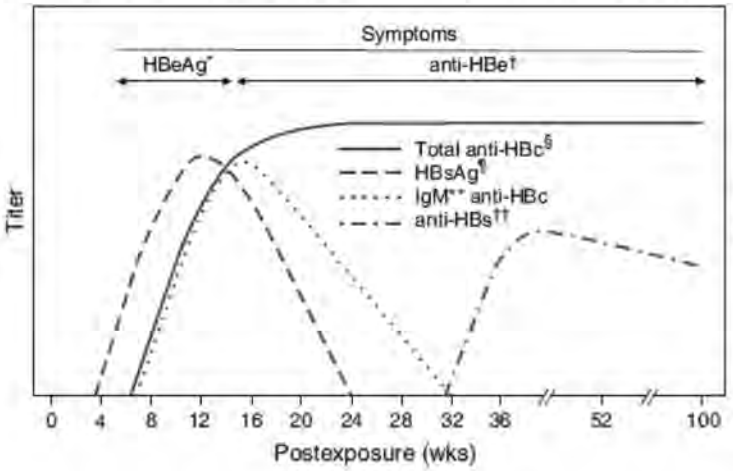


Figure 13.13 Hepatitis B serology interpretation

HBsAg	Anti-HBc-Ab	Anti-HBs-Ab	IgM anti-HBc-Ab	Interpretation
-	-	-		No acute or chronic infection. Hep B infection in incubation period; repeat Hep B diagnostic after 2-6 month if suspected. Not immunised and could become infected if exposed.
-	+	+		No acute or chronic infection. Patient has previous infection. Depending on the antibody level, the patient is now immune.
-	-	+		No acute or chronic infection. Patient had hepatitis B vaccination. Immunity depends on antibody level
+	+	-	+	Acute infection
+	+	-	-	Chronic infection (can check HBeAg to see if patient is very infectious)
-	+	-		Unclear – could be: 1. Resolved infection (most common) 2. False positive anti-HBc 3. Low level chronic infection 4. Resolving acute infection

Figure 13.14 Serology of acute Hepatitis B infection and recovery*new



* Hepatitis B e antigen.
† Antibody to HBeAg.
§ Antibody to hepatitis B core antigen.
¶ Hepatitis B surface antigen.
** Immunoglobulin M.
†† Antibody to HBsAg.

TREATMENT

- Supportive treatment only: if the patient is dehydrated, or cannot eat or drink, admit to IPD
- Encourage the patient to drink or give maintenance IV fluids
- No alcohol!
- Stop drugs that could affect the liver (e.g. paracetamol)
- When giving medications check if safe in liver disease or if a different dose needs to be given
- Specific treatment for hepatitis B or C is not available at many clinics on the border

PREVENTION

- **Hepatitis A**: improvement of sanitation.
- **Hepatitis B**: general precautions for health workers, vaccination (and immunoglobulin) including for PEP (*see p.12*), testing of donor blood, condom use, don't re-use needles.
- **Hepatitis C**: general precautions for health workers, testing of donor blood (although not currently available at most clinics on the border), don't re-use needles.

VACCINATION

Hepatitis B vaccine (*see Vaccine schedule for Thailand and Myanmar, Appendix 2*).

13.6.3. LIVER CIRRHOSIS

DEFINITION

Cirrhosis is a chronic liver disease that destroys the cells of the liver and replaces them with scar tissue. This is an irreversible (cannot be cured) liver tissue damage.

CAUSES

- Common causes:
- **Chronic alcohol abuse**
- **Chronic hepatitis B (or C)** virus is a common cause
- Less common causes
    - Auto-immune e.g. primary biliary cirrhosis
    - Genetic e.g. Recurrent haemolysis due to blood disorders, biliary atresia (congenital structural abnormality of liver/bile ducts), enzyme deficiency (Alpha-1-Antitrpysin)
    - Drugs e.g. isoniazid, steroids, paracetamol overdose
    - Chronic heart failure ("Cardiac cirrhosis")

SIGNS AND SYMPTOMS

- Jaundice
- Malaise, weakness, bodily itching
- Red palm of hands (palmar erythema)
- Slow hand tremor
- Ascites, oedema of the legs and back
- Muscle wasting
- Hair loss
- Loss of libido (decreased sex drive)
- Peripheral neuropathy
- Hepatic neuropathy
- Spider naevi (red spider-like blood vessels on the skin)
- Men: Gynaecomastia, testicular atrophy, impotence
- Women: Breast atrophy, irregular menstruation, amenorrhoea
- Haemorrhage: bruises, purpura, epistaxis
- Portal hypertension: splenomegaly, caput medusa (distended abdominal veins), varices bleeding (distended veins in the GI tract, especially the oesophagous)
- Hand signs: clubbing, pigmentation, Dupuytren's contracture (thickening of the tendon of the 4th or 5th fingers), white nails

COMPLICATIONS

- Hypoglycaemia
- Liver failure +/- encephalopathy (confusion, disorientation)
- Portal hypertension +/- oesophageal varices +/- GI bleeding
- Ascites
- Infections (spontaneous bacterial peritonitis)
- Poor nutrition +/- vitamin deficiencies
- Gastro-intestinal bleeding (bleeding of varices in oesophagus)
- Hepatocellular carcinoma (liver cancer)
- Heart and kidney failure

DIAGNOSIS
Liver function test (AST/ALT high, albumin low); sometimes the LFT are not elevated because the liver does not produce enough enzymes anymore. Alpha feto-protein (AFP) is a blood test for liver cancer, discuss with doctor if appropriate. Ultrasound of liver, if available.

TREATMENT
It is not possible to cure cirrhosis, only to control the symptoms and to delay liver failure:
General Treatment:

- Strongly advise patients to STOP alcohol – give support in stopping if addicted to alcohol
- Nutrition: high protein, low salt diet
- Monitor BP, because HBP can increase portal hypertension (high BP in the portal vein, see below) Portal hypertension is a risk for bleeding from varices
- If possible, vaccinate against Hepatitis B, if not already infected. If Hepatitis B positive give counselling for their partner to get screening/immunisation
- Avoid drugs that can cause liver toxicity e.g. paracetamol, Anti-TB drugs, statins, NSAIDs
- If alcohol is the cause give prophylactic thiamine (vitamin B1) to prevent Wernicke's encephalopathy
- Lactulose helps preventing constipation and maybe beneficial in hepatic encephalopathy

Specific treatment:

1. Portal Hypertension

DEFINITION
A patient with liver cirrhosis will have scarring in the liver which causes increased pressure in the portal vein (the blood vessel that carries blood form the spleen and GI tract to the liver). Increased pressure causes the veins in the oesophagus, stomach, rectum and abdominal wall to dilate (called varices) and possibly rupture and bleed. This will cause fresh blood in vomit (haematemesis) or bleeding in the stool (melaena or fresh bright red blood).

SIGNS AND SYMPTOMS

- Splenomegaly
- Caput medusa (distended abdominal veins)
- Variceal bleeding

TREATMENT

- For **upper gastrointestinal haemorrhage**: *see DRS AB-CABDE/S management (Figure 13.2, p.100)*
- When stable start propranolol 40mg BID to decrease the risk of bleeding from the varices. Increase to 80mg BID according to HR/BP (max 160mg BID)

2. Ascites

DEFINITION
Fluid collection in the abdominal cavity. May lead to abdominal distension and is caused by portal hypertension and/or low albumin.

DIAGNOSIS

- Clinical – look for other signs of liver failure
- Abdominal ultrasound – to look at liver, kidneys and amount of ascites
- Think about other causes of oedema e.g. heart failure, kidney failure, low albumin (consider blood tests e.g. albumin, BUN & creatinine)

TREATMENT

- Decrease salt intake
- Diuretics
    - **Spironolactone** 50mg OD (increased to 200-400mg OD if needed)
    - **Furosemide** 20mg OD (increase to 120mg if necessary)
    - **Increase diuretics by ratio of 2:5 furosemide:spironolactone**
- **Note**: If on chronic high doses of diuretics check sodium, potassium, BUN and creatinine regularly
- Record weight daily.

If tense ascites does not improve with medication, consider paracentesis to remove ascitic fluid. Discuss with doctor. how much fluid to remove as removing too much liquid can lead to circulatory collapse. After paracentesis, the patient will feel better, but the fluid will return and ascites will become tense again.

Paracentesis complications: infection, bleeding (hematoma, hemoperitoneum) or bowel perforation.

3. Spontaneous Bacterial Peritonitis (SBP)

DEFINITION

Patients with ascites have risk for infections of the ascitic fluid without an obvious source of infection. Common organisms are *Klebsiella*, *E. coli* and *Pneumococcus*. Anaerobic organisms are rare (<1%).

SIGNS AND SYMPTOMS

- Abdominal pain
- Fever (although may not have fever)
- Decreased bowel sounds
- Sometimes confusion, drowsiness

DIAGNOSIS

- If possible, check CBC, blood culture, Liver function tests (LFTs), creatinine & BUN
- If unsure of diagnosis can send sample of peritoneal fluid for culture and cell count (Likely SBP if neutrophils >250cell/mm3).
- **Note**: DO NOT WAIT FOR RESULTS BEFORE GIVING ANTIBIOTICS

TREATMENT

- Start **ceftriaxone** IV 1g OD
- Use **metronidazole** only if you suspect anaerobic infection (<1% of causes of SBP)

4. Hepatic Encephalopathy

DEFINITION

Normally the liver removes the toxins (e.g. ammonia) in the blood. A damaged liver (e.g. cirrhosis) does not remove toxins well, so toxin level increases in the body. The toxins cause changes to brain function (decreased consciousness, irritability, confusion). Infection, constipation or gastrointestinal bleeding can also increase the risk for changes in consciousness.

SIGNS AND SYMPTOMS

- Sleep problems (sleeping too much/drowsy, too little, or sleeping during the day)
- Mood or personality changes
- Trouble concentrating or thinking clearly
- Shaking
- Slurred speech
- Coma

DIAGNOSIS

- Clinical, look for an infection, rule out any other causes of confusion (e.g. stroke etc.)

TREATMENT

- If available give **lactulose** 30ml OD or BID (this decreases ammonia production and helps pass stool)
- **Stop diuretics** and correct electrolyte abnormalities
- Treat any infection, dehydration, or GI bleeding
- Remove any sedatives (medications, drugs or alcohol)

5. Hepatocellular carcinoma

DEFINITION

Primary cancer of the liver

RISK FACTORS

1. Alcohol excess
2. Hepatitis B and C
3. Aflatoxin (a toxin produced by fungus)
4. Liver cirrhosis
5. Haemochromatosis (disease with high iron levels)
6. Wilson's disease (disease with high copper levels)
7. Liver flukes (e.g. *Opisthorchis* or *Clonorchis*) can cause cholangiocarcinoma (cancer of the bile duct)

DIAGNOSIS

- Ultrasound of liver, can check alpha feto-protein (AFP) but AFP is not very reliable
- Definite diagnosis is made by liver biopsy and histologic examination

TREATMENT

- Refer to hospital
- If referral to hospital is not possible, provide palliative care

13.6.4. BILIARY COLIC

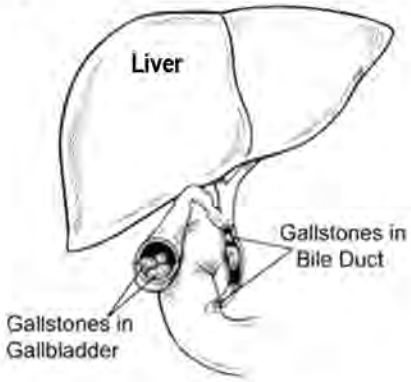
DEFINITION

Biliary colic is severe abdominal pain caused by the passage of a stone through the bile duct. When there is an obstruction of the bile duct, jaundice can occur. The blockage may be caused by gallstones or worms (especially ascaris). During pregnancy, gallstones are more common.

RISK FACTORS

Four **F**s – **F**emale, **F**ertile, **F**at, **F**orty (years old)

Figure 13.15 Anatomy of the liver



SIGNS AND SYMPTOMS

- Pain comes in waves (colicky) and can radiate to back and right shoulder
- Guarding in right upper quadrant (RUQ)
- Central abdominal pain moving to RUQ
- Vomiting
- No fever, no jaundice

DIAGNOSIS

- Diagnosis is made clinically. Check stool for worms.
- Ultrasound of gallbladder to reveal stones (if available).

TREATMENT

- **Buscopan** IM or IV 20mg, not more than 4 times per day
- **Analgesics** (e.g. ibuprofen, diclofenac). Opioids (e.g. tramadol) may increase the pressure in the bile ducts system and should only be given in severe pain
- If the pain persists after two injections of buscopan and NSAIDs consult a doctor
- Worm treatment

If there is also evidence of infection e.g. fever, high WBC then treat as acute cholecystitis

PREVENTION

- Regular deworming (e.g. of pregnant women)
- Intake of a healthy, low fat diet
- Weight loss

13.6.5. ACUTE CHOLECYSTITIS

DEFINITION

Acute cholecystitis is a bacterial infection of the gall bladder mostly due to obstruction of the bile ducts. It may follow an attack of biliary colic. Cholecystitis can also be due to malnutrition or typhoid fever.

SIGNS AND SYMPTOMS

- Pain, tenderness and guarding in the RUQ. Pain radiating to the right shoulder
- Vomiting
- Fevers, rigors
- Jaundice (if bile duct obstruction)

DIAGNOSIS

- Diagnosis is made clinically and by ultrasound.
- A specific sign for acute cholecystitis is the **Murphy's sign**. This is when the RUQ is palpated at the same time as the patient is asked to take a deep breath. If he suddenly stops inspiration (due to pain), this is a positive sign.
- If available, do a gallbladder **ultrasound**. Findings suggestive of cholecystitis are gallstones, fluid around the gallbladder, gallbladder wall thickening (> 3 mm) and dilated bile ducts.

COMPLICATIONS

Empyema (gallbladder fills with pus), gallbladder rupture, formation of a fistula, peritonitis.

Watch for signs of acute abdomen. This is an emergency.

TREATMENT

- Bed rest
- IV fluids, no food or drink
- **Buscopan** IM or IV 20mg QDS (max 100mg/d)
- Strong **Analgesia** e.g. tramadol PO 50-100mg, not more often than every 4 hours (max dose 400mg/d)
- **Ceftriaxone** IV 1g OD and metronidazole IV 500mg TID
    - When fever decreases change to oral **ciprofloxacin** 500mg BID and **metronidazole** 500mg TID (total 10 days of antibiotics)
- After the acute infection is better consider referral for **surgical removal** of gallbladder. Without surgery, recurrence is 25%

PREVENTION

- Surgical removal of the gallbladder will prevent further attacks of cholecystitis
- Intake of a healthy, low fat diet
- Lose weight

13.6.6. ACUTE PANCREATITIS

DEFINITION

Acute pancreatitis is inflammation of the pancreas. Acute pancreatitis can become chronic. Patients can become very unwell, very quickly (mortality rate 10-15%).

CAUSES - "**I GET SMASHED**"

Most common:
Idiopathic (no obvious reason)
Gallstones
Ethanol (= Alcohol)
Trauma

Less common:
Steroids Medications e.g. steroids, HIV drugs, metformin
Mumps infection
Autoimmune
Scorpion poison
Hypercalcemia, hypertriglyceridemia
ERCP (a surgical procedure)
Drugs (Tetracycline, furosemide, co-trimoxazole)

SIGNS AND SYMPTOMS

- Severe epigastric pain radiating to back (like a belt); mostly dull pain
- Nausea, vomiting
- Jaundice
- If chronic pancreatitis: weight loss, fatty stool (floats on the water and bad smell), diarrhoea

Jaundice without abdominal pain may be pancreatic or gallbladder cancer, examine for a mass

DIAGNOSIS

- Epigastric tenderness on examination. No signs of peritonitis/bowel obstruction
- If possible, consider checking amylase (if pancreatitis will be 3 or more times the normal range)
- Ultrasound may show inflamed pancreas (very difficult to see), but may also show other causes e.g. gallstones, alcoholic fatty liver disease

COMPLICATIONS

Acute respiratory distress syndrome, acute renal failure, bleeding in the GI-tract or retroperitonal area, hypotensive shock, chronic pancreatitis, abscess or necrosis of pancreas, pseudocysts, pleural effusion.

TREATMENT

- Bed rest
- Strict **NPO** - No food or drink until the inflammation has resolved
- Intravenous fluids – NSS, D5W, careful **monitoring of fluid input/output** is very important
- **Buscopan** IM or IV 20mg QDS (max 100mg/d)
- Strong **Analgesia** e.g. tramadol PO 50-100mg, not more often than every 4 hours (max 400mg/d)
- **No surgery** is needed

PREVENTION

Gallbladder removal after cholecystitis, decrease alcohol intake, weight loss.

13.6.7. LIVER ABSCESS

DEFINITION
One or more collections of pus within the liver. There are two types of liver abscess:

1. Amoebic
- Due to the protozoa *E. histolytica*
- More common than bacterial in tropical settings
- Recent episode of dysentery
- Treat with metronidazole and some cases will need drainage

2. Bacterial (= pyogenic)
- Mostly due to *E. coli, Klebsiella, Proteus, Staphylococcus* and *Streptococcus*
- Mostly from bacteria ascending the bile ducts
- The patient is often unwell/septic
- Needs antibiotics and drainage

SIGNS AND SYMPTOMS
- Fever, chills, no appetite, nausea. Sometimes just feel unwell
- Painful and enlarged liver (hepatomegaly) on palpation or percussion (in 50% of cases)
- Sometimes chest pain with a right-sided pleural effusion
- Usually no jaundice, no splenomegaly, no ascites (if present think of other diagnoses)

DIAGNOSIS
- Clinical symptoms
- **Ultrasound**
- Check stool sample. It can help to find specific cause (e.g. *E. histolytica*, or rarely liver flukes (*Fasciola hepatica, Clonorchis* and *Opisthorchis* can cause liver abscess by blocking the bile flow)

TREATMENT

Treatment depends on the cause of the abscess (amoebic or pyogenic). But it is difficult to know the difference between these two forms.

1. Amoebic abscess: the patient is mostly stable (moderately unwell/ not septic)

Start **metronidazole** PO x 7-10 days:

Adults:	750mg TID
Child	15mg/kg TID

****Note**: Metronidazole doses for amoeba are higher than usual. Follow the recommended dose.

Drainage of amoebic abscesses is not routinely recommended. Consider drainage if (i) high risk of liver rupture (e.g. abscess > 5 cm), (ii) abscess in the left lobe of the liver, (iii) not improving with metronidazole (3-5 days), (iv) if you are not sure if amoebic or pyogenic abscess.

2. Bacterial (= pyogenic) abscess: the patient is mostly unwell/septic:

Start **IV ampicillin, gentamicin and PO metronidazole** (dose for stable patient).
Continue for 10-14 days.

Drainage of the abscess is the most important treatment. Discuss this with the patient and consider referring the patient to the hospital for surgical drainage. **If the patient does not improve on treatment, consider other causes (e.g. parasites, hepatic tuberculosis).**

PREVENTION
Adequate and early treatment of (amoebic) dysentery could prevent liver abscess.

13.7 INTESTINAL WORMS

Intestinal worms are very common (*ascaris / hookworm/ trichuris /small liver flukes*). There are different ways how patients get infected.

Worms should be treated to:
1. Prevent anaemia, malnutrition, impaired growth, delayed development.
2. Prevent the following complications:
   - Intestinal obstruction/obstructive jaundice
   - Cysticercosis (*Taenia solium*) – lesions in brain and skin
   - Cancer (in an infection with small liver flukes)

Immunosuppressive medication decreases the immune system response. Worm infections can get worse. Therefore, ALWAYS check the stool and consider deworming even if stool sample is negative in patients that need steroids (e.g. prednisolone) for another disease.

13.7.1. SOIL-TRANSMITTED HELMINTHS

DEFINITION
Soil-transmitted helminths are *ascaris, hookworm and trichuris.*
These worms do not use an intermediate host and infect humans directly through contaminated soil.
Eggs are passed in the faeces (= stool) by an infected person and go to the soil.
Infection with *Ascaris* and *Trichuris* is caused by eating the eggs (e.g. contaminated hands, food or water).
Hookworm larvae hatch from eggs in the stool and enter through the skin (e.g. walking barefoot.)
The adult worms live in the intestines of the infected person.
Ascaris and hookworm migrate through the body to the intestine. *Trichuris* larvae live inside the intestine.
Children with worms have more problems than adults, like impaired growth and developmental delay.

SIGNS AND SYMPTOMS
- Mostly asymptomatic
- Worms can be seen in the stool or vomit
- Abdominal pain or diarrhoea
- Epigastric pain, especially in hookworm infection
- Fever, dry cough during larva migration
- Enlarged, swollen abdomen
- Chronic anaemia
- Chronic micronutrient loss
- Complications: intestinal obstruction, jaundice, rectal prolapse
- Rash from migrating worm (cutaneous larva migrans) occurs in an infection with a zoonotic hookworm (e.g. dog hookworm).
- Larva currens in *strongyloides* infection

DIAGNOSIS
- Stool microscopy test for eggs and/or larvae
- CBC can show eosinophilia

TREATMENT
- *See Figure 13.16 Treatment of worms table, p.122.*
- Treat any associated anaemia and malnutrition
- **Note**: A negative stool samples does not exclude a worm infection. If worms are suspected but do not have a stool sample, treat the patient empirically,

Mass deworming projects are recommended for all schoolchildren and pregnant women in the second and third trimester of pregnancy in areas where worms are endemic

PREVENTION
Advise people to use latrines, wash hands after passing stools and before eating/cooking, wear shoes.

13.7.2. TAENIA (TAPE WORM)

DEFINITION
This worm is long, flat, made up of many short segments (= proglottids) and can be up to 10 meters long. Infection occurs by eating raw or undercooked pork (*Taenia solium*) or cattle (*Taenia saginata*). The eggs and the segments (proglottids) of these parasites leave the human body in the stools and infect pigs or cattle.

SIGNS AND SYMPTOMS
- Patient sees worm pieces in stools or vomit
- Abdominal discomfort, epigastric pain, nausea
- Patient eats a lot but still loses weight
- If humans ingest *T. solium* eggs directly (instead of contaminated pork meat), nodules (= cysticerci) can be found in the skin or muscles. If cysticerci migrate to the brain, cysts can form in the brain and cause seizures. **Neurocysticercosis** is the most common cause of epilepsy in tropical regions

DIAGNOSIS
- Stool microscopy
- CBC can show eosinophilia

TREATMENT
- *See Figure 13.16 Treatment of worms table, p.122*

PREVENTION
Advise people to:
- Avoid eating raw or undercooked pork and any meat in general
- Wash hands with soap and water after using the toilet and before handling food, use latrines
- Meat should be inspected for cysts: do not eat pork/cattle if it is likely to be infected with tapeworm

13.7.3. LIVER FLUKES*NEW

Opisthorchis viverrini and *Clonorchis sinensis*, which are known as small liver flukes (SLF), and *Fasciola hepatica* (known as common liver fluke). These parasites are flatworms that reside in the bile ducts. Infection occurs by ingestion of undercooked freshwater fish (*Opisthorchis* and *Clonorchis*) and vegetable (e.g. water cress) in *Fasciola*.

SIGNS AND SYMPTOMS
- Mostly asymptomatic
- Abdominal discomfort/pain
- Nausea/vomiting, loss of appetite

COMPLICATIONS
Opisthorchis and *Clonorchis* significantly increase the risk of cancer (cholangiocarcinoma).
The longer the patient is infected, the higher the risk is.
Repeated treatment, as a sign of repeated infection also increases the risk.
Other complications are hepatic fibrosis, cholangitis, cholecystitis, obstructive jaundice and liver abscess.

DIAGNOSIS
- Stool microscopy
- CBC can show eosinophilia
- Ultrasound to check for complications

TREATMENT
- *See Figure 13.16 Treatment of worms table, p.122*

PREVENTION
Advise people to:
- Avoid eating raw or undercooked fish (small liver flukes)
- Advise to clean or cook vegetable before consumption (*Fasciola*)

Figure 13.16 Treatment options for worms

Organism	Treatment	
	Oral treatment for adults and children >1 year (avoid in 1st trimester of pregnancy)	Children (avoid in children < 6 mo old)
Roundworms (Nematodes): infection by contact with soil/water/food infected with human faeces		
Hookworm	1. Albendazole[1] 400mg STAT 2. Mebendazole 100mg BD x 3 days	Mebendazole[2] (6mo - 1 year OR < 10kg) Give 50mg STAT or BD x 3d Albendazole[1,2] (1 - 2 years old) Give 200mg STAT or OD x 3d
Ascaris Lumbricoides		
Trichostrongyliasis		
Trichuris Trichiura	1. Mebendazole 100mg BD x 3 days 2. Albendazole[1] 400mg OD x 3 days	
Enterobius Vermicularis	1. Albendazole[1] 400mg STAT, repeat day 14 2. Mebendazole 100mg STAT, repeat day 14	
Strongyloides larva	1. Albendazole[1] 400mg OD x 3 days	
Capillaria	1. Albendazole[1] 400mg OD, for 10 days 2. Mebendazole 200mg BD, for 20 days	Consider treatment up to 30 days. Relapse is common if treatment is not completed.
Tapeworm (Cestode): infection from ingesting raw or undercooked infected meat		
Taenia species	Praziquantal[3] 10mg/kg STAT	Only use if >2 years old. Give adult dose
Hymenolepis nana or diminuta	Praziquantal[3] 25mg/kg STAT, repeat day 14	
Flatworms (Trematodes): ingestion of raw, undercooked, alted, pickled, or smoked freshwater fish, crab, or crayfish		
Opisthorchis viverrini, Clonorchis sinensis	Praziquantal[3] 25mg/kg/dose TID x 3 days	Only use if >2 years old. Give adult dose
Paragonimus		
Fasciola hepatica	Refer: discuss with doctor	
Protozoa: infection from contaminated water or food		
Giarda Lamblia	Tinidazole 2g STAT	Only use if > 3 years old. Give 50mg/kg STAT or OD x 3d[2]
Entomoeba histolytica	Tinidazole 2g OD x 3 days	
Balantidium Coli		
Blastocystics Hominis, Entomoeba Coli	No treatment, not pathogenic; if symptoms repeat stool test	
Cryptosporidium	Refer: discuss with doctor	Consider treatment if symptomatic or immunocompromised

Note: This table may be updated again in the future. The worm treatment table is an update from the 2018 Obstetric guidelines.
[1] Albendazole should be given when empty stomach. Avoid in the first trimester of pregnancy.
[2] Mebendazole maximum child dose should not be more than the adult dose. Avoid in the first trimester of pregnancy.
[3] Praziquantal should be chewed before swallowing

14.1 URINARY TRACT INFECTIONS*UPDATE

DEFINITION

Urinary Tract Infection (UTI): symptoms and bacteria in the urine from an infection somewhere between the kidneys and the bladder.

- **Lower UTI** (cystitis): infection in the bladder
- **Upper UTI** (pyelonephritis) infection in the kidney
- **Prostatitis**: infection of the prostate

Diabetes Mellitus is a risk factor for UTI. **UTIs in men are not common**, so think about other diagnosis e.g. prostatitis, STIs, renal stones or enlarged prostate (if older age). Urinary tract infections in children require treatment as soon as possible in order to prevent kidney damage. Recurrent UTIs can lead to urinary tract stones, urinary tract obstruction from scarring or chronic renal failure.

There is an increasing resistance of bacteria to some antibiotics like amoxicillin and cotrimoxazole. UTI treatment should be according to local resistance/sensitivity patterns. Refer to a local antibiogram (if available) or discuss with microbiology lab.

CAUSES

- Ordinary bacteria, usually E. coli, can cause acute or chronic UTI
- Tuberculosis bacteria causes chronic UTI
- Sexually transmitted infections (STI)
- Urethral catheter
- Obstruction of urinary tract with stones or mass or congenital abnormality
- Intercourse
- Pregnancy
- No special cause in some females

All children **< 5 years old with more than one UTI** should be referred for further investigation at a hospital if possible. Unexplained **recurrent UTIs in adults** may be caused by urinary tract stones, tumours or STIs. Consider referral.

If you suspect a UTI you must think of lower UTI/cystitis (infection of the bladder) or upper UTI/ pyelonephritis (infection of the kidney.) **Note**: Cystitis NEVER has fever in adults.

SIGNS AND SYMPTOMS

Lower UTI **Cystitis**	• Dysuria (pain or burning when pass urine NOT HOT URINE) • Cloudy urine • Blood in urine (haematuria) • Frequent urination • Pain and tenderness lower abdomen	****NO FEVER****
Upper UTI **Pyelonephritis**	**Symptoms of lower UTI AND/OR** • Flank pain (kidney area) • Chills and rigors • Sepsis or shock	****AND FEVER****

Remember to also ask about:

- Vaginal itchiness: **candida**
- Vaginal or penile discharge: **STI**
- If suprapubic pain: is it similar to menstrual pain? **menstrual cramps**
- Recent antibiotic use: may affect the culture being positive

DIAGNOSIS

- Urine dipstick, urine sediment, and urine culture (Ucx)
- Urine dipstick and sediment are not so accurate for diagnosis, but you can get results immediately.
- Urine culture is the best test but takes a few days for results.
- Children and pregnant women can have false negative dipstick because of frequent urination. If you suspect UTI, consider doing sediment also.

Figure 14.1 Interpretation of urine dipstick and urine sediment results in patients with lower UTI symptoms

Urine Dipstick	Urine Sediment	Action (*see Figure 14.3*)
Any Positive	Positive	Treat as UTI
Strong positive	Not needed	Treat as UTI
Weak Positive	Negative	Maybe UTI
Negative	Positive	Maybe UTI
Negative	Negative	UTI unlikely

Urine dipstick:
Negative = (WBC negative and nitrite negative)
Weak positive = (WBC 1-2+ and nitrite negative) **OR** (WBC negative and nitrite positive)
Strong positive = (WBC 3+) **OR** (WBC 1-2 and nitrite positive)
Any positive = weak positive or strong positive

Urine sediment:
Positive = WBC ≥ 10 **AND** Epithelial cells < 5
Negative = WBC <10
Contaminated = Epithelial cells ≥5 (need to repeat)

Extra-information you can get from the tests:
Urine Dipstick:

- **Specific gravity**: a sign of dehydration, normal hydration = <1.010, mild = 1.010-1.020, moderate = 1.025-1.030, severe >1.030
- **Ketones**: sign of anorexia, if ketones high check dextrose. If dextrose high may be a sign of diabetic ketoacidosis (*see Diabetic emergency, p.25*)
- **Glucose**: If positive, this is a sign of diabetes
- **Protein**: if very high may be a sign of renal failure – consider checking BUN/Creatinine
- **Blood (erythrocytes)**: especially if WBC/nitrite negative may be a sign of renal stones or trauma
- **Haemoglobin**: may be a sign of haemolysis
- **Urobilinogen**: a sign of haemolysis or liver disease.

Urine Sediment:

- **RBC casts, granular or waxy casts**: renal failure, discuss with doctor, check BUN/ Creatinine
- **WBC casts**: infection or inflammation
- **Crystals e.g. phosphate, calcium**: renal stones

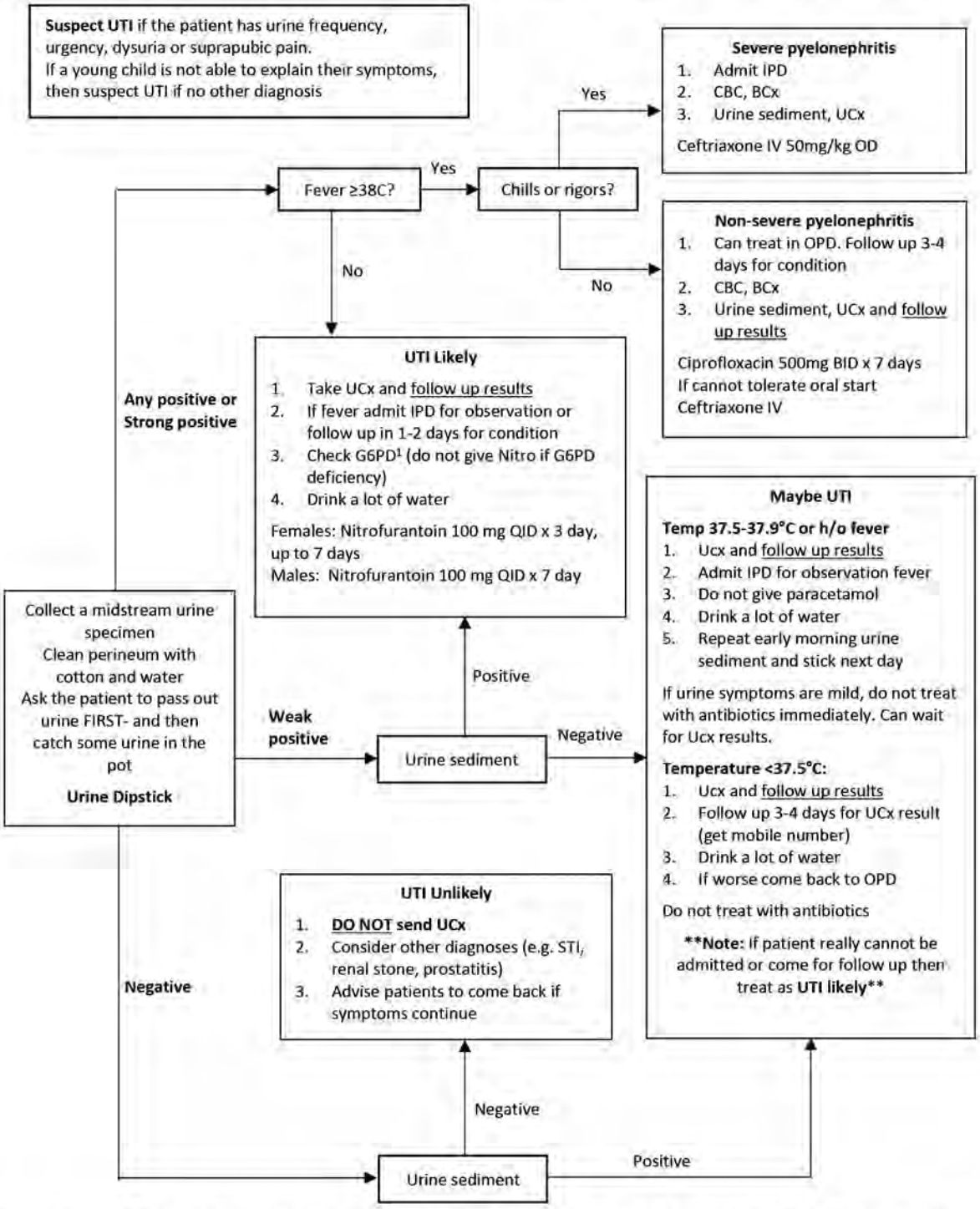
Figure 14.2 How to interpret urine culture results

Urine culture (UCx): do a mid-stream urine collection (MSU) in sterile container. Store in fridge. Transport in cool box.	
Mixed growth of > 2 organisms	Contaminated specimen (not clean). Repeat if UTI still suspected.
Mixed growth and one organism >10^5 cfu	Not a clean specimen, but the organism found may be causing illness. Treat if symptomatic.
One organism >10^5 cfu	Most likely urine is infected. Look at the drug sensitivities and treat with the safest, cheapest oral drug that is effective against that organism (e.g. nitrofurantoin, Amoxicillin/Ampicillin and cotrimoxazole are cheapest; In G6PD deficiency ciprofloxacin is safer than nitrofurantoin/fosfomycin)
Antibiotic resistance to antibiotics	If no symptoms, discuss with doctor. Do not give antibiotics. Consider follow up, counsel on preventing UTI, and repeat MSU

TREATMENT FOR UTI

- For routine treatment of UTI, *see Figure 14.2 on the next page.*
- If the patient has recent UTI treatment, there could be a resistant bacterial infection (*see p.162*). Ask the patient to follow up in the clinic for the urine culture result.
- Multi-drug resistant bacteria are increasing. Try to always send urine culture to confirm diagnosis and sensitivity. Change treatment based on culture results.
- Alternative treatments if bacteria are resistant:
  - Cotri BID for 3 days (can be used if the bacteria are sensitive on urine culture)
  - Fosfomycin 3 gm po x 1 (stat) dose or 1 gm IV x 1 (stat) dose
  - Meropenem 1gm IV TID, discuss with doctor for how long to treat

Figure 14.3 Flowchart for UTI and pyelonephritis ≥3 years old (*see Appendix 10 for <3 years old*)*update



[1] **Note:** Nitrofurantoin and ciprofloxacin can cause haemolysis in G6PD deficiency. **If G6PD deficient do not use nitrofurantoin.** You can still use ciprofloxacin but the patient should stop the drug and to return to IPD if symptoms of **jaundice** or **dark urine** occur.

In cases of recurrent cystitis, think about bladder stone, kidney stone, STIs, or resistant bacteria. Men do not usually get cystitis. Think about STIs or prostatitis in a man with UTI symptoms. Recurrent UTIs in children should be investigated with ultrasound.

TREATMENT FOR PYELONEPHRITIS*UPDATE

***DRS AB-CABDE/S if unwell*:**

1. Admit to IPD
2. Send urine culture
3. Antibiotics
   - Patient not vomiting/septic: PO ciprofloxacin 500mg BID for 7 days (10 days if pregnant)
   - Patient vomiting/septic: IV ceftriaxone 1g OD: treat with IV for 24 hours after afebrile then change to PO **ciprofloxacin** or a sensitive antibiotic (depending on urine culture results) to complete **7 days**
   - If the patient has received antibiotics for UTI or pyelonephritis recently, the patient may be at risk for multi drug resistant bacteria, *see p.162.* Discuss alternative treatment with a doctor
4. Treat pain and fever
5. Monitor urine output
6. Advise to drink plenty of water (3-4 litres/day for adults)
7. IV fluids if not able to drink water/ signs of shock
8. Ultrasound scan of kidneys (if available) to look for any abnormal anatomy (in children) or sign of obstruction and hydronephrosis (stone)

Check the urine culture result and change antibiotics if the bacteria are resistant.

PREVENTION OF UTI AND PYELONEPHRITIS

- Drink at least 2 litres of water per day
- Urinate at least 3-4 times per day so urine does not stay in bladder for a long time
  - In females, it is important to urinate immediately after intercourse
- Encourage good hygiene
- Avoid constipation, so bladder does not stay full (bladder cannot empty well because of stool)

14.2 PROSTATITIS

DEFINITION

Inflammation of the prostate. Can be associated with STI.

SIGNS AND SYMPTOMS

- Fever
- Pain and tenderness in the rectum or when pass stool
- Often very painful rectal examination
- Cloudy urine
- Haematuria (blood in urine)
- Dysuria (pain or burning when passing urine
- Frequent urination

DIAGNOSIS

- Rectal examination
- Examine urine: cloudy or bloody urine
- Urine dipstick and urine sediment positive

TREATMENT

DRS AB-CABDE/S if unwell

1. Treat in IPD until the patient's temperature returns to normal.
2. Prevent dehydration: drink plenty of water (3-4 litres/day for adults).

3. If the patient cannot drink, give IV fluids and monitor urine output.
4. Treat pain and fever.
5. Avoid constipation – advise high fibre diet.
6. Antibiotics
   - **Ciprofloxacin** 500 mg BID oral for 4 weeks.
   - If the patient cannot take oral medication: **Ceftriaxone** 1 gram OD IV/IM until the patient can tolerate oral medication.

14.3 KIDNEY STONES

DEFINITION

The formation of stones in the urinary system (in bladder or in kidney), can cause partial or complete obstruction. Stones formed in the kidney can travel down and block the ureters or urethra. Stones in the kidney cause kidney pain. Stones in the ureter cause renal colic.

In patients with repeated urinary infections look for stones.

SIGNS AND SYMPTOMS

- Severe acute lumbar or pelvic pain; intermittent (**renal colic: patient cannot lie still and has pain that spreads from flank to pubic area**) or constant
- Blood in the urine (**haematuria**)
- The patient passes **stones in the urine**
- If also has infection may have fever, chills, dysuria etc.

DIAGNOSIS

Urine dipstick: Often positive for blood. If positive WBC/nitrite there could also be an infection.
Urine sediment: Often positive for RBC. If positive WBC/bacteria there could also be an infection.
Ultrasound kidney or bladder to look for stones and any abnormal anatomy which would make stones more likely. Bladder stones are more common in children and if very big or cannot pass, should refer for surgical removal.

TREATMENT

- Admit to IPD
- Drink 3-4 litres/day for adults. If unable to drink, give IV fluids
- If fever and chills (secondary infection) treat as for pyelonephritis
- Treat the pain according to the severity:
- **Paracetamol (this is the safest medicine for pain in pregnant women)**
  - **Ibuprofen, diclofenac, aspirin** PO or IM are alternatives. These drugs are also called NSAIDS DO NOT use NSAIDS in pregnant women after EGA 20 weeks
  - **Buscopan** (hyoscine butylbromide) IM/IV depending on severity
  - Child 6-12 yrs: 5-10mg TID (max 30mg/d)
  - Child >12 yrs or Adult: 20mg QDS (max 100mg/d)
  - Repeat the same dose after 30 minutes if still pain
  - **Tramadol** PO 50-100mg, not more often than 4 hours (max 400mg/d)

Consider referral:
If pain is not relieved with maximal analgesia.
If there are signs of urethral obstruction (e.g. suprapubic pain and no urine output)
If there is chronic obstruction to prevent kidney damage

PREVENTION

Drink plenty of fluids, as dehydration is a risk factor. Avoid food that could cause stones (peppers, cashew nuts, cocoa, grapefruit/orange juice, black tea, Cola).

14.4 ACUTE KIDNEY INJURY

DEFINITION

Acute kidney injury (AKI) is a sudden loss of kidney function. It is important to treat AKI quickly. Patients can become very unwell. AKI leads to complications including death. It may also lead to chronic kidney disease.

Normal urine output should be at least 0.5ml/kg/hr in adults and 1ml/kg/hr in children

SIGNS AND SYMPTOMS

Most often there will be symptoms of the cause (e.g. diarrhoea causing dehydration, flank pain from renal stone). Other complaints may be:

- Fatigue
- Headache
- Nausea/Vomiting
- Loss of appetite
- Low urine output (oliguria)
- **No urine output (anuria) **DANGER SIGN****
- Oedema

1. Pre-renal (problem before the kidney)
   - **Dehydration** e.g. from diarrhoea, not drinking enough when unwell (**most common cause**)
   - Problem with blood vessel supply to kidney
2. Renal (problem in the kidney)
   - Drugs causing damage to the kidneys e.g. NSAIDs
   - Acute kidney diseases
3. Post-renal (problem after the kidney causing a blockage to the flow of urine)
   - Kidney stones e.g. blocking the ureter
   - Tumours e.g. bladder/urethra
   - Large prostate

DIAGNOSIS

- **Urine output**
- **Ultrasound** to rule out any cause of obstruction (e.g. renal stone) or complications e.g. hydronephrosis (swelling of the kidney)
- **BUN and creatine**: blood tests that show kidney function. If the BUN is much higher than the creatinine (BUN:Creat ratio >20:1) then it is a sign that kidney blood flow is low e.g. dehydration.
  Normal range (**Note**: normal ranges are different for each laboratory, especially children):
  - BUN: Adults 5-23mg/dL, Child >1mo 5-18mg/dL
  - Creatinine: Adult Male: 0.67-1.17mg/dL; Female: 0.61-0.95 mg/dL (creatinine is a product of muscle, so males have higher levels), Child 0.03-0.88mg/dL.
  - **Note**: BUN can also increase if there is an upper GI bleed (*see p.100*)
- **Creatinine Clearance**
  You can use the following equation to help you calculate the estimated creatinine clearance. This is another way that tells you how the kidneys are working. The lower the creatinine clearance the worsethekidneysareworking.Thisisusefultoknowwhenprescribingdrugsinrenalfailuree.g.donotuse gentamicin if Creatinine Clearance <20ml/minute, decrease the dose of ampicillin or cloxacillin if Creatinine Clearance <10ml/minute.

$$\frac{((140\text{-}Age)\ X\ Mass(kg)\ X\ (0.85\ if\ female))}{(72\ X\ Serum\ Creatinine\ )}$$

TREATMENT

- If dehydration give **NSS** fluid bolus and assess for response by monitoring the urine output.
- Carefully monitor fluid input and output. Consider inserting a catheter.
- Treat the underlying condition.
- Stop any drugs that may have caused the kidney failure e.g. NSAIDs.
- Do not give any drugs that are contraindicated in renal failure.
- Change doses of drugs according to the creatinine clearance.

No urine output (anuria) after fluid replacement is a DANGER sign. This means the patient may need dialysis (artificial kidney treatment). If have catheter, make sure it is not blocked and causing no urine to come out. If no urine output discuss with doctor about referral.

14.5 ACUTE GLOMERULONEPHRITIS

DEFINITION

Acute Glomerulonephritis (AGN) is an inflammation of the filter of the kidneys. One of the common causes that can be treated is Post-Streptococcal Glomerulonephritis. This disease usually follows a skin infection (e.g. *impetigo see p.261*) or throat infection (e.g. *tonsillitis see p.233*). It is more common in children over the age of 3 years.

SIGNS AND SYMPTOMS

- 50% of AGN are very mild and the patients do not seek medical care.
- In other cases, the patient can have:
  - Rust, tea, or Coca cola coloured urine
  - Fluid retention (oedema) especially of the face, but it can be generalised (lung or cerebral oedema) in severe cases
  - Low urine output with concentrated urine (oliguria)
  - Hypertension usually mild, but it can be severe in 5-10% cases
  - If oedema is generalised there may be signs of circulatory congestion and pulmonary oedema: difficulty breathing, crackles at lung base

CAUSES

There are many causes of acute glomerulonephritis. It can sometimes follow other infections like pneumonia, typhoid, leptospirosis, malaria, hepatitis C, or measles. The kidney develops inflammation in the tissue and cells which allows blood and protein to leak into the urine.

DIAGNOSIS

- **Urine dipstick**: protein (proteinuria), blood (haematuria).
- **Urine sediment**: Red and white blood cells, hyaline, granular and red blood cell casts.
- If available, check **ASO (anti-streptolysin O) titre**. If increased, the diagnosis is more likely Post Streptococcal Glomerulonephritis.

Ask for history of previous skin or throat infections. Look at the skin to find signs of old impetigo.

TREATMENT

- Admit to IPD, rest
- Restrict salt intake
- Restrict fluid intake to 500ml to 1L per day in adults, 50ml/kg/day in children (max 1L)
- Antibiotics e.g. **amoxicillin** or **cloxacillin** (*see tonsillitis and impetigo*) are recommended if the infection is still present
- In case of severe oedema (ascites or pulmonary oedema):
  - PO **furosemide** Child 1m-12yrs: 0.5-2mg/kg 2-3 times daily (max 80mg/d)
    >12yrs/Adult: 20-40mg OD (max 600mg/d)
    If there is no response to furosemide even before the maximum dose, consider urgent referral for dialysis (renal replacement therapy).
- Treat complications: hypertension (*see p.35*), acute pulmonary oedema (*see p.44*)
- Acute phase usually lasts 6-8 weeks, haematuria and proteinuria usually disappear in 1 year, need regular follow up.

PREVENTION

Effective treatment (finish 10 days of medicine) of tonsillitis or impetigo. Treatment within 10 days of onset can prevent AGN. Prevent other infections that can cause glomerulonephritis.

14.6 NEPHROTIC SYNDROME

DEFINITION
In nephrotic syndrome, large amounts of protein are found in the urine (proteinuria) and blood levels of protein decrease (hypoalbuminaemia). Low protein in the blood cause generalised oedema.

SIGNS AND SYMPTOMS
- Generalised painless oedema, location depends on position and activity (e.g. sacral and periorbital oedema in the morning which improves during day when standing up)
- In severe cases there is pulmonary oedema
- High BP
- Normal urine function in the beginning but may develop reduced urine output (oliguria)
- Protein in the urine (massive proteinuria)

CAUSES
Nephrotic syndrome may be due to kidney disease (primary glomerular disease) or can be a complication of other diseases like diabetes mellitus or infection (secondary glomerular disease). The exact cause can only be found by doing a kidney biopsy.
- It is most common in children 2-12 years old
- In children <15 years old, the most common cause of nephrotic syndrome is Minimal Change Disease and is usually responsive to steroids

DIAGNOSIS
The diagnosis is clinical. For children, the most common cause is Minimal Change Disease and over 90% will respond to steroids. If the child is at least 1 year old and less than 12 years old, has normal BP (*see Paediatric BP ranges, Appendix 12a-boys and 12b-girls*), no visible haematuria (tea colour urine), and no kidney failure (very high creatinine), you can try a course of steroids. For adults, it is better to refer.

These tests may help with diagnosis if available:
- Urine dipstick protein ≥3+, blood maybe slight positive (if blood 1+, think of other diagnosis)
- 24-hour urine collection – proteinuria >3g/d (adult) or >50mg/kg/d (child)
- Albumin (low)
- Sodium (high)
- Cholesterol and triglyceride (high)

TREATMENT
Find and treat the underlying cause (e.g. diabetes mellitus, infection)
All patients should be first treated in IPD. Drug therapy of nephrotic syndrome consists mainly of steroids (such as prednisolone) and diuretics.

1. **Steroids** (*see Figures 14.3, p.132 and 14.4, p.133 for dosing*)

- **Stopping steroids suddenly is dangerous** and can lead to death from hypotension. All patients should be supervised regularly until the treatment is completed. Tell the patient that they must not stop suddenly and they must be very careful not to run out of tablets
- **Each case must be considered carefuly, if treatment cannot be supervised and the patient cannot follow up, do not begin steroid treatment.**
- Always take prednisolone with meals because it can cause gastric ulcers. Consider prescribing 20mg OD **omeprazole** to protect the stomach.
- Be aware of the side effects of prednisolone (high BP, gastric ulcers, osteoporosis (weak bones), weight gain, acne, glaucoma etc.)

When patients have been on steroids for more than 2 weeks it is important to decrease the dose slowly. When decreasing prednisolone if you do not have 1mg tablets or unable to cut tablets use the recommendation as a guide and discuss with a doctor to create a decreasing regime.

2. Diuretics

Note: Diuretics relieve oedema but do not treat the disorder and should only be used if there is pulmonary oedema or moderate to severe ascites

Use a combination therapy of:
Furosemide

Adult:		40mg OD
Child:		1mg/kg OD

AND/OR spironolactone (check renal function before giving)

Adult:		100-200mg OD
Child:	1m-12yrs	1-3mg/kg OD
	12-18yrs	50-100mg OD (max 400mg/d)

Reduce according to clinical response.
Note: be alert to signs of hypovolemia or electrolyte imbalance when using diuretics.

3. Treatment of other diseases

Remember that there is a **high risk of infection because of the loss of immune proteins and treatment with steroids.** Therefore, treat any other infection.
For example:

- Give **albendazole** (3-day course for strongyloides) to prevent the spreading of worms BEFORE starting steroids
- Be sure that your patient has no active TB or amoebic disease (steroids make them worse)
- Treat for high BP with **enalapril (check contraception and family planning for women)**
- We do not have the drugs for elevated cholesterol, so cannot give this treatment

4. Prophylaxis of other diseases

During the oedema the patient has a high risk of infection: consider **penicillin V** (500 mg PO BID) prophylaxis and **pneumococcal vaccine**.

5. Other important management

- Avoid immobilisation (because of high risk of thrombosis especially if albumin <20g/l) – encourage gentle exercise e.g. walking around the clinic
- Careful fluid restriction e.g. intake < 1L per day
- Give a high calorie/high protein diet
- Weigh patient every day. Aim to lose up to 1kg/day.
- Keep in IPD until the patient's condition is improving, then discharge with a **weekly follow-up** (check weight and urine dipstick)

Patients who recover on prednisolone can relapse (have more episodes of nephrotic syndrome). **Ask the patient to return to OPD as soon as he/she slight oedema.** Discuss with doctor and consider giving the treatment again.

FOLLOW UP

- Nephrotic syndrome can last a few years and sometimes can cause renal failure.
- Follow patients regularly for first 6 months and then case by case for at least 2 years if possible
- Cousel to follow up in between scheduled visits if there are new or worsening symptoms

When decreasing steroids check urine dipstick every 1-2 weeks to make sure that the nephrotic syndrome is not worsening: if has proteinuria again discuss case with the doctor or team and consider referral

Figure 14.4 How to use prednisolone for nephrotic syndrome 1yr to <10yrs

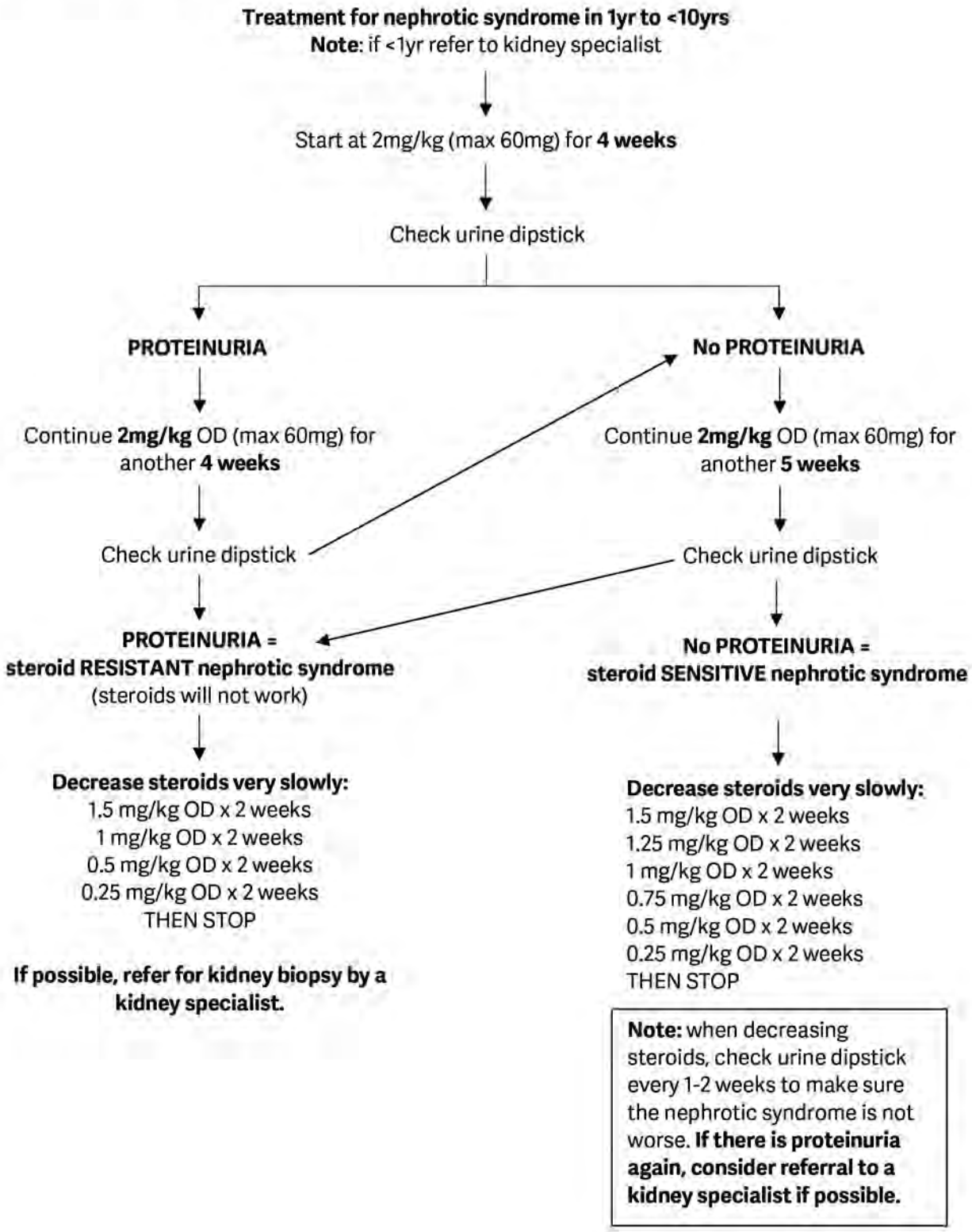
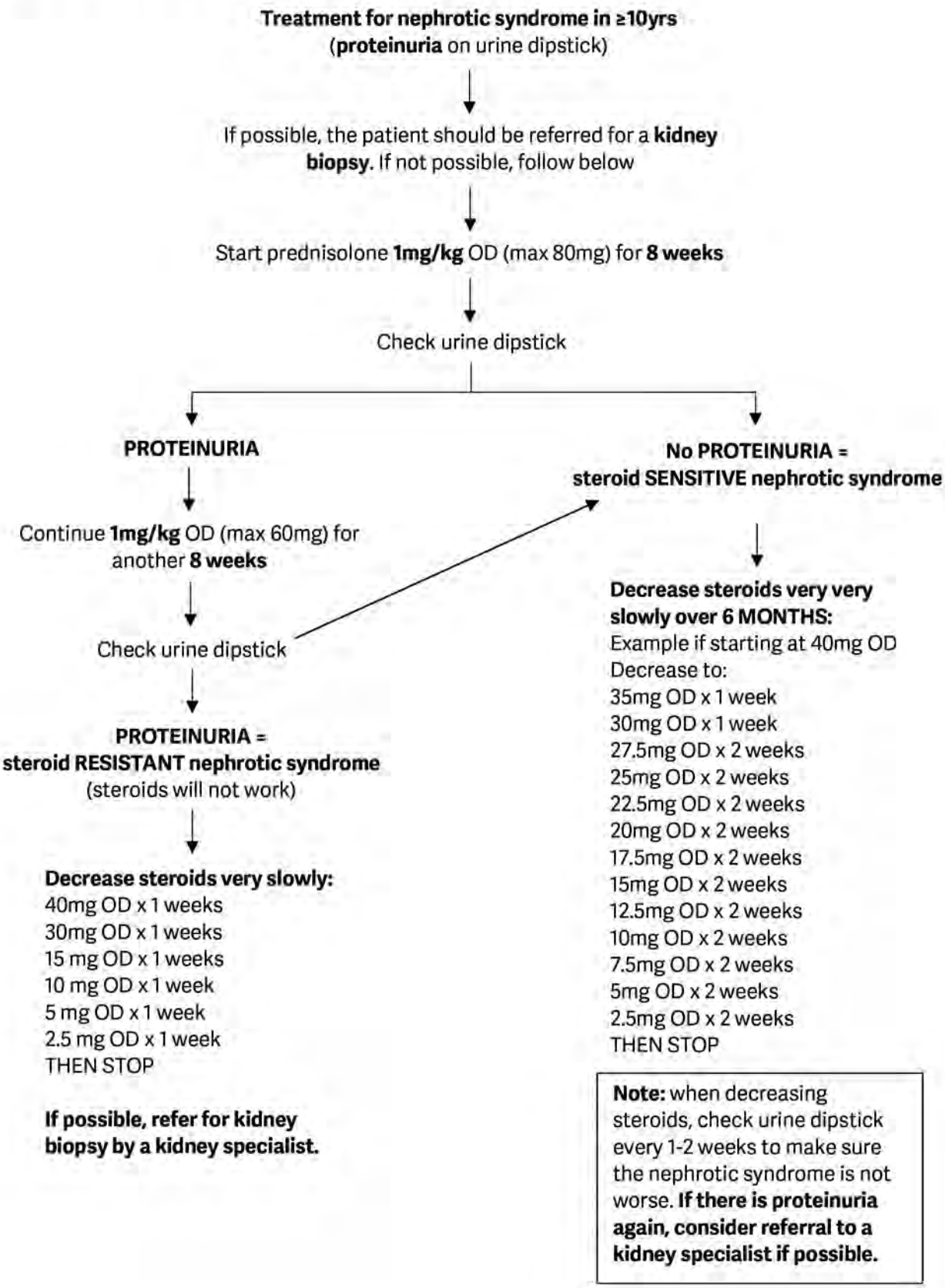


Figure 14.5 How to use prednisolone for nephrotic syndrome ≥10yrs



15.1 ANAEMIA*UPDATE

DEFINITION

Red blood cells (RBCs) have haemoglobin (Hb). Hb carries oxygen from the lungs to the tissues. RBCs.stay in the blood circulation for 100 to 120 days. When the RBC is old, the spleen and liver will remove from the blood. New RBCs are made in the bone marrow and replace the old ones. If more RBCs are destroyed or lost, the bone marrow will increase the production of new RBCs to send into the blood.

Anaemia is the condition where the haematocrit (Hct) or haemoglobin (Hb) are below normal levels in the circulating blood (the number of RBC is decreased). When anaemia happens, the RBCs may not carrying enough oxygen to the tissues of the body. This can be an acute or chronic condition. Anaemia can affect anyone. However, pregnant women and young children are most at risk. The signs and symptoms depend on the severity of anaemia and if the anaemia is acute or chronic.

Anaemia can occur from:
a) increased RBC loss (e.g. haemolysis and haemorrhage), AND/OR
b) decreased RBC production (e.g. nutritional deficiencies and bone marrow depression), AND/OR
c) normal production of RBC but have shorter life or abnormal features (e.g. Thalassemia, SAO)

15.1.1. ACUTE ANAEMIA

SIGNS AND SYMPTOMS

ACUTE SYMPTOMATIC ANAEMIA – RAPID FALL IN HB (e.g. acute bleeding, severe malaria, PPH)

Fatigue, tiredness
Difficulty breathing **at rest**
Palpitations **at rest**
Pallor (conjunctivae, palm of hands, nail beds)

Fast heart rate at rest (adult >120/min)
Fast respiratory rate at rest (adult >40/min)
Low BP (systolic <100 mmHg)
Often you can hear a heart murmur

ANAEMIC HEART FAILURE

Severe difficulty breathing at rest
Extreme weakness
Chest pain in some cases
Very pale

Acute pulmonary oedema
Enlarged liver (hepatomegaly)
Full jugular veins
Peripheral oedema and sometimes ascites

CAUSES

Acute bleeding	RBC destruction
• GI tract, genital tract	• **Malaria** (*see Malaria Guideline*)
• Artery damage in accident	• Blood transfusion with wrong ABO group type
• Pregnancy related hemorrhage (e.g. ruptured ectopic pregnancy and PPH)	• Oxidative drugs (e.g. primaquine, methylene blue, some antibiotics) in subjects with G6PD deficiency
	• Auto- immune disease where the immune system by mistake destroys the RBCs
	• Accidental intravenous administration of distilled water

DIAGNOSIS

Acute anaemia may be a clinical diagnosis and should be confirmed by laboratory tests if the patient is seen at the SMRU clinic. Often anaemia has more than one cause and if there are more than one cause for anaemia the laboratory test results may not give a clear diagnosis.

Laboratory tests (*see Figures 15.1 and 15.2, see next page*):

- Hematocrit
- Haemoglobin (can be done with Hemocue machine at the clinical site)
- Complete blood count (CBC); the following blood indices are particularly important:
- Iron analysis in serum. Low ferritin level can be very low in iron deficiency. If the ferritin is normal or high, there could be other causes of anaemia.
- There are other tests you can do to find the cause of the acute anaemia. Discuss with a doctor.

Figure 15.1 Hb/Hct treatment levels in anaemia*update

	Hb (g/dL)	Hct %
Males ≥15 years	< 12	< 36
Females ≥15 years (non-pregnant)	< 11	< 33
Females (pregnant)	< 10	< 30
Child <15 years	< 11	< 33

Pregnant women and children <2yr: treat all anaemia. Some Hb fall is physiological in pregnancy.

Non-pregnant adults and older children: give nutrition counselling, treat anaemia only if have symptoms.

Figure 15.2 How to interpret the CBC*new

Index	What it is	If lower than normal	If higher than normal
Red blood cell count (RBC)	Number of red blood cells	Acute or chronic blood loss; deficiency in Iron, vitamin B12, or folate; haemolysis; bone marrow damage; leukemia or lymphoma	Dehydration; kidney problems; thalassemia; genetic RBC defects; pulmonary disease; congenital heart disease
Reticulocytes	Immature red blood cells in the circulating blood; reticulocytes are bigger than mature RBCs	Bone marrow suppression	Anemia, recent blood loss (e.g. menstruation), red blood cell hemolysis
Hemoglobin (HGB)	Carries oxygen in RBC	Acute or chronic blood loss; deficiency of Iron, vitamin B12, or folate; haemolysis; bone marrow damage; leukemia or lymphoma; thalassemia and genetic RBC defects	Dehydration; kidney problems; pulmonary disease; congenital heart disease
Hematocrit (HCT)	How much of the blood volume is RBCs		
Mean corpuscular volume (MCV)	Average size of red blood cells	Iron deficiency; thalassemia and genetic RBC defects	Vitamin B12 or folate deficiency; very high reticulocyte count
Mean corpuscular hemoglobin (MCH)	The amount of hemoglobin in each RBC		Vitamin B12 or folate deficiency
Mean corpuscular hemoglobin concentration (MCHC)	The average amount of hemoglobin in an amount of RBC (ml)		Sickle cell disease, hereditary spherocytosis
Red cell distribution width (RDW)	Variation in RBC size; if high then many different sizes of RBC in the blood		Iron deficiency, vitamin B12 or folate deficiency; recent blood loss
White blood cell count (WBC)	Number of white blood cells, which protect the body against infection	Autoimmune diseases, immunosuppression, bone marrow failure, cancer chemotherapy, viral infections	Infection, inflammation, leukemia, intense exercise, stress, corticosteroids
Neutrophils (N)	Number or percentage of neutrophils; most common WBC	Immunosuppression, bone marrow failure, chemotherapy	Bacterial infection, inflammation, leukemia, intense exercise, stress, corticosteroids
Lymphocytes (L)	Number or percentage of lymphocytes	Immunosuppression, HIV-AIDS, bone marrow failure, chemotherapy	Viral infections, leukemia, lymphoma
Monocytes (M)	Number or percentage of monocytes	Immunosuppression, bone marrow failure, chemotherapy	Chronic infections, autoimmune diseases, leukemia
Eosinophils, absolute (E)	Number or percentage of eosinophils	NA	Parasitic infections (e.g. worms), asthma, allergy
Basophils, absolute (B)	Number or percentage of basophils	NA	Allergy
Platelet count (PLT)	Number of platelets; need for blood clotting	Viral infections; bone marrow failure; vitamin B12 deficiency; leukemia or lymphoma; sequestration (take up) in the spleen; some medications	Leukemia, myeloproliferative disorders (which cause some blood cells to grow abnormally in bone marrow), inflammatory conditions
Mean platelet volume (MPV)	Average volume of a platelet; new platelets are bigger than old ones	Aplastic anemia, thrombocytopenia	Some inherited disorders

EMERGENCY TREATMENT (FOR SEVERE OR ACUTE ANAEMIA)

If signs of hypovolaemic shock follow DRS AB-CABDE/S on *Figure 4.8, p.16.*

Note: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step*

Figure 15.3 DRS ABCDE chart for severe anaemia and hypovolaemic shock

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **SEVERE ANAEMIA/ HYPOVOLAEMIC SHOCK**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	**Oxygen**
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**Put 2 large (16G or 18G) IV cannula. Check: Hct, CBC, MS, dextrose etc.** **Fluid bolus NSS 1L (DO NOT GIVE if suspect heart failure)** **Crossmatch and transfuse blood** If very low BP raise legs to level above head Try to stop the bleeding e.g. compression of artery
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	Give dextrose if low Give **medications according to cause**
E	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan Transfer to maternity facilities e.g. if miscarriage/abortion.
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

Development of severe anaemia is very rapid with malaria, especially in children. It is the first cause of death in young children with malaria.

NON-EMERGENCY TREATMENT OF SEVERE OR ACUTE ANAEMIA
(no signs of hypovolaemic shock)

Treat the anaemia:

- If Hb <6 /Hct <18, discuss with doctor about transfusion.
- Anaemic heart failure is very difficult to treat successfully. If possible, prevent heart failure by giving treatment before reaching this stage. Treat the pulmonary oedema (*see p.43*).
- **All patients with anaemia should be dewormed.**
- Give **ferrous sulphate (FS) and folic acid (FA).** (*For the SMRU IV iron protocol*new*, see Appendix 14*)

One tab (200mg) of ferrous sulphate contains 65mg of iron)

Treatment dose	Adult: 200mg TID	**Folic acid**	Adult: 5mg OD
Prophylactic dose	Adult: 200mg OD	**Folic Acid**	Adult: 5mg/week

- After 6 weeks treatment dose change to prophylactic dose for a total of 3 months (if Hb/Hct normalised). A response to oral medication usually appears in <2 weeks (Hb should raise by 1g/dL every 7-10 days). FS should be continued for 3-6 months after the Hb level has returned to normal to refill the body's iron store. Administration of **vitamin C** may help the body to absorb iron.
- If there is no response to treatment after 3-6 months, *see treatment for chronic anaemia, next page.*

If you know the cause of anaemia, FIRST check severity, THEN treat the underlying cause.

1. Malaria
   - Give anti-malaria drugs, *see Malaria guidelines*
   - Give ferrous sulphate only after the malaria smear is negative
   - Admit to IPD if there are signs of acute anaemia / anaemic heart failure, severe or hyper PF malaria
   - Give blood transfusion if Hb ≤6g/dL or Hct <20%. If there is severe or hyperparasitaemic malaria, you can transfuse earlier especially if the patient is clinically unstable (ie. shock, acute kidney injury). Discuss with doctor first
2. Septic shock
   - Treat with the appropriate antibiotic
   - Give ferrous sulphate only after no fever for 48 hours and clinically improved
3. Drug related haemolysis
   - Stop the drug
   - Admit to IPD if the patient is unwell, has symptoms, or if you are worried the Hb/Hct will drop more
   - *Refer to the Haemolysis SOP, see Appendix 13*

PREVENTION

Prevent (malaria) infections and treat early. Test for G6PD deficiency before giving haemolytic drugs (*see Figure 15.4, p.141*). Provide FS and FA to all pregnant women in prophylaxis doses and provide advice on nutrition. Deworm all pregnant women (after the 1st trimester) and children of school age.

15.1.2. CHRONIC ANAEMIA

SIGNS AND SYMPTOMS

Chronic mild anaemia may be asymptomatic. This is because anaemia can slow to develop (e.g. chronic hookworm infection, repeated malaria illness). If not treated, mild anaemia can worsen. In pregnant women and children this can cause impaired foetal development and delayed development. Young children may have increased risk of infection. Some people with genetic problems such as thalassemia can have mild anaemia without symptoms because they have low levels of haemoglobin since birth (*see Section 1.2, p.3*).

Chronic anaemia

- Tiredness
- Affects ability to work (therefore, lower income, poorer care for children)
- In children: reduced growth, delayed development, not able to do well at school
- Difficulty breathing and palpitations when working or walking (but **normal breathing at rest**)
- Pallor (conjunctivae, palm of hands, nail beds)
- Normal heart rate and respiratory rate at rest

Severe chronic anaemia – when Hb <6g/dL with normal PR and RR at rest

- Extreme tiredness and weakness
- Dyspnoea and palpitations on minimal effort
- Very pale
- Often heart murmur
- Normal heart rate and respiratory rate at rest

CAUSES

- **Nutritional deficiencies** (low iron (ferrous), folate or vitamin B12 in diet)
- **Hookworm and ascaris**
- **Repeated pregnancies** (maternal anaemia)
- **Prolonged breastfeeding without starting foods** (infant anaemia)
- Peptic ulcer
- Alcohol excess
- Haemoglobinopathies
- Chronic bleeding, heavy menstruation
- Cancers
- Chronic infections (HIV, TB)
- Liver and kidney disease
- Tropical splenomegaly
- Aplastic anaemia (bone marrow failure)

DIAGNOSIS

Diagnosis is the same as for acute anaemia, see above.

TREATMENT

- If you do not know the cause for anaemia, follow the Non-Emergency treatment, see previous page.
- Hookworm, trichuris or ascaris in stool (can also treat if you suspect worms but stool test negative)
  - De-worm
  - Give FS and FA treatment dose
- Poor nutrition, pregnancy and breastfeeding
  - Give nutrition advice
  - Give FS and FA prophylaxis dose during the pregnancy. (*See Obstetric Guidelines*)

If a patient remains anaemic despite treatment, consider the following diagnoses:

1. Poor compliance (compliance and adherence have the same meaning)
   - Adherence for some people is difficult. Maybe they cannot tolerate the side-effects of of FS which include vomiting, epigastric pain or diarrhoea/constipation. They may also forget to take thier medication doses. Consider alternative management in these patients
2. **Vitamin B12 deficiency**
   - MCV usually is high. On a peripheral smear check for multi-segmented neutrophils (> 5 lobes) and large red blood cells. These patients respond well to **Vitamin B12 IM injection** (1mg) 3 x per week for 2 weeks. After these two weeks give one injection once a month for 3 months in addition to **B complex** 2 tablets BID (or vitamin B12 tablets) and **FS** supplementation
3. Alcohol
   - There is usually a high MCV. Ask the patient about how much alcohol they drink, advise them to stop/decrease if it is high
   - **Hypothyroidism**
   - If no other cause for anaemia is found and MCV is high consider checking thyroid function.
   - **Genetic RBC disorders (e.g. thalassemia)**
4. Non-adherence: patient not taking FS or FA
5. Poor absorption: need to take FS with acidic things (Vit C or orange juice
6. Underlying haemoglobinopathy: need to check Hb typing

About half of all maternal deaths in the tropics are due to anaemia
Many people in rural areas along the border are anaemic because of poor nutrition, repeated malaria attacks, many pregnancies, continuous breast-feeding and hookworm infections.
These common causes of anaemia in this area are very easy and cheap to treat.

PREVENTION

- Prevention is important if the female patient has heavy menstrual bleeding
- Eat foods that have iron such as meat, meat organs, eggs, spinach, kales, green leafy vegetables.
- In pregnant women, give FS and FA prophylaxis and counsel on nutrition. **Deworm all pregnant women** (after the 1st trimester) and children of school-going age
- Prevent infections, diagnose and treat infections early (e.g. malaria, typhoid, dysentery)

15.2 THALASSAEMIAS AND ABNORMAL HAEMOGLOBINS*UPDATE

DEFINITION

Thalassaemia and abnormal haemoglobins (haemoglobinopathies) are genetic diseases. They cause low haemoglobin (Hb) production in the RBCs. Hb has two alpha (α) and two beta (β) chains. Thalassaemias cause decreased number of Hb chains: In α thalassaemia the α chains are less and in β thalassaemia the β chains are less. Some abnormal haemoglobins (e.g. HbE, HbS, HbC) have the normal number of chains but the structure of the chains is abnormal.

There are many variations of the disease. This disease severity depends on if the chains are less or if the structure is abnormal. The symptoms can be from very severe to almost asymptomatic. In the border population β-thalassaemia and HbE occur in ~15% of people while α-thalassemia occurs in ~25% of people.

SILENT ALPHA THALASSAEMIA AND ALPHA THALASSAEMIA TRAIT - Affects 1 or 2 of the 4 alpha chains

SYMPTOMS	None to mild, well-tolerated anaemia, often noticed in pregnancy
DIAGNOSIS	CBC, Hb electrophoresis gives only possible diagnosis, need molecular tests to diagnose
TREATMENT	Folic acid, Vitamins B

BETA THALASSAEMIA TRAIT - Affects one of the beta-chains

SYMPTOMS	Mild, well-tolerated anaemia, often noticed in pregnancy
DIAGNOSIS	CBC, Hb electrophoresis
TREATMENT	Folic acid; Vitamins B; May need iron in infancy and pregnancy

HAEMOGLOBIN E TRAIT AND HOMOZYGOUS HAEMOGLOBIN E - Affects one of the beta-chains

SYMPTOMS	Very mild to mild, well-tolerated anaemia, often noticed in pregnancy
DIAGNOSIS	CBC, Hb electrophoresis
TREATMENT	Folic acid; Vitamins B; May need iron in infancy and pregnancy

THALASSAEMIA INTERMEDIA - Usually affects both beta-chains but with combination of different haemoglobinopathies (e.g. HbE trait and beta-thalassemia trait together)

SYMPTOMS	Well-tolerated anaemia that gets worse with age, splenomegaly
DIAGNOSIS	CBC, Hb electrophoresis
TREATMENT	Check Hb regularly Folic acid; Vitamin B, do not overload with iron Splenectomy can sometimes help (may need to update vaccines before surgery)

Beta Thalassaemia minor and intermedia should be suspected in all patients with mild anaemia that does not improve with ferrous sulphate or folic acid.

HAEMOGLOBIN H DISEASE - Affects 3 of 4 alpha chains

SYMPTOMS	Mild to severe anaemia
DIAGNOSIS	CBC, RBC staining, Hb electrophoresis but need molecular tests to diagnose
TREATMENT	Might need transfusion. Folic acid; Vitamin B

BETA THALASSAEMIA MAJOR - Affects both beta-chains

SYMPTOMS

- Severe anaemia, starting in the first year of life
- Child does not grow and develop well
- Child has many infections
- Abnormal bone growth, especially in the face
- Enlarged liver and spleen

Without transfusion
- Death usually occurs within the first year of life

With enough chronic blood transfusion
- Improves child growth and development, and school attendance
- Infections are less, overall health and bone deformities improve
- Symptoms of iron overload (e.g. liver disease and cardiac toxicity) appear after ~10 years
- Many blood transfusions from different donors causes the recipient to develop antibodies to fight against the different kinds of blood. This can cause haemolysis. Cross match (mix donor and recipient blood on slide) will prevent haemolysis. There are special screening tests available but not at SMRU
- Death is usually due to cardiac iron overload

With not enough chronic blood transfusion
- Anaemia with decreased growth, slow development and bone deformity
- Enlarged spleen
- Intermittent fever
- Bleeding
- Death usually occurs at 20-30 years old, from cardiac iron overload

DIAGNOSIS
CBC, RBC staining or Hb electrophoresis

TREATMENT
- Transfusion is the only effective treatment, but chronic blood transfusion causes increased iron levels. This damages some organs, causing death (consider giving desferrioxamine at each blood transfusion, this is called 'chelation therapy' which can help decrease iron overload)
- Regular transfusions help to keep Hb >8g/dL, Hct >24%
- Give regular Folic acid, vitamin C
- If splenomegaly is present, discuss the possibility of having surgery to remove the spleen (splenectomy) but the benefit of this is only temporary

Pregnancy makes the anaemia of haemoglobinopathies worse and this may be the first time a patient presentswith acute or chronic anaemia

15.3 G6PD DEFICIENCY

DEFINITION

This disease is caused by a deficiency of the enzyme G6PD (glucose-6-phosphate dehydrogenase) in the red blood cells. RBCs need the G6PD enzyme to function and protect from oxidative stress from outside agents (e.g. infection, primaquine). When the G6PD enzyme is low RBCs can function well but cannot stop the oxidative stress. So the RBCs break down (haemolysis) more easily. G6PD is a genetic disease and is passed to parents to children. Patients may have **severe** deficiency (males and females) or **intermediate** deficiency (females only).

Some infections and drugs cause acute haemolytic anaemia (RBC destruction) in G6PD deficient patients. Even with teh same dose reactions may be different in each patient, some have no symptoms and others may need a blood transfusion.

SIGNS AND SYMPTOMS

- Most patients have no symptoms. Acute haemolytic anaemia might occur after taking certain drugs (*see below*) or having an acute illness:
- Jaundice, pallor, dark urine, sometimes abdominal and back pain
    - Neonatal jaundice with or without anaemia
    - Symptoms of anaemia: fatigue, difficulty breathing, tiredness, palpitations
    - If symptoms develop after a drug (*see Figure 15.4*), you should suspect G6PD deficiency

DIAGNOSIS

Qualitative blood tests (Carestart or fluorescent spot test) give a normal or abnormal result and can diagnose severe G6PD deficiency. ***Quant***itative tests give results as a number (the quantity of the enzyme). There are many G6PD normal patients, some G6PD intermediate and few G6PD deficient patients. No test is currently available that gives exactly the risk of having haemolysis or the severity when taking certain drugs. ****Note**: If you suspect haemolysis caused by a drug in a G6PD normal female, discuss with someone experienced with G6PD defiency what tests to do.****

If there is acute anaemia or recent blood transfusion, wait for 2 months before testing for G6PD again when the patient is at their baseline.

TREATMENT

- Stop drugs that may cause the haemolysis. Usually the haemolysis will improve without treatment
- Treat any infection
- Check the patient urinates enough, encourage the patient to drink plenty of fluids
- May need blood transfusion

Try to avoid or be careful when prescribing the following drugs:

If you really need to give these drugs for treatment, tell the patient that if they become jaundiced or they see their urine becoming dark, they should stop the tablets and come to clinic immediately.

Figure 15.4 Haemolytic drugs in G6PD deficiency

Likely cause haemolysis in G6PD deficiency	Possibly cause haemolysis in G6PD deficiency
Methylene Blue Nitrofurantoin Primaquine, Tafenoquine Quinolones (including ciprofloxacine, norfloxacine, ofloxacin, nalidixic acid) Sulphonamides (include co-trimoxazole) Silver sulfadiazine cream (used for burns) Naphthalene moth balls	Aspirin Chloroquine (acceptable in malaria) Vitamin K analogue (menadiol sodium phosphate) Quinine (acceptable in malaria) Vitamin C especially in high doses

PREVENTION
Avoid drugs or chemicals that may cause haemolysis in known G6PD patients. If you diagnose a patient as G6PD deficient, make a clear note in their lemma so other health workers are aware.

15.4 BLOOD TRANSFUSION

Indications for transfusion
Give transfuion only if donor blood is tested for ABO group and screened for malaria, hepatitis B and HIV.

When you have to decide whether to transfuse:
Weigh up the benefits of the transfusion with the risks of transmitting disease e.g. hepatitis, HIV.
Transfuse only if necessary; the **clinical condition of the patient is the most important.**

****To decide if you need to give an URGENT transfusion, do not look only at the Hb/Hct result****
Also look at the patient: check for pallor, weakness, check the pulse, RR and BP

Transfuse URGENTLY when:
Signs of severe acute symptomatic anaemia or anaemic heart failure
AND/OR
Acute severe bleeding
AND/OR
Severe or hyperparasitaemic malaria (see malaria guidelines)

Consider transfusion:
Signs of severe chronic anaemia with Hb <6g/dL or Hct <20%

**There is no international agreement about the level of Hb to give a transfusion when there are no signs of shock. Some doctors will transfuse a patient with Hb higher than 6g/dl, other doctors will not transfuse a patient even if Hb is 4. This decision will depend on the patient's age, general health conditions, social situation and the cause of the anaemia.*

Do NOT transfuse when:
Signs of moderate chronic anaemia

After transfusion all patients should be treated with a treatment dose of ferrous sulphate and folic acid and de-wormed. For patients with thalassaemia major, give only folic acid and de-worm.

Steps to follow to give a transfusion:

For the PATIENT:
1. Explain the risks and benefits of transfusion.
2. Check the patient's ABO blood group and rhesus group (+ or -).
3. Insert the largest cannula possible in a large vein - the smaller the cannula, the slower the blood flow.
4. Give an infusion of NSS to keep the vein open or give blood directly.
5. Look for a donor with the same blood group as the patient.
6. In an emergency, if you cannot find a donor of the same group, follow the rules of blood group compatibility (*see Figures 15.5 and 15.6, below*).

Figure 15.5 Blood group compatibility

PATIENT	CAN RECEIVE BLOOD FROM
A	A, O
B	B, O
AB	AB, A, B, O
O	O
Group O = Universal donor Group AB = Universal acceptor	

Figure 15.6 Blood group antigens

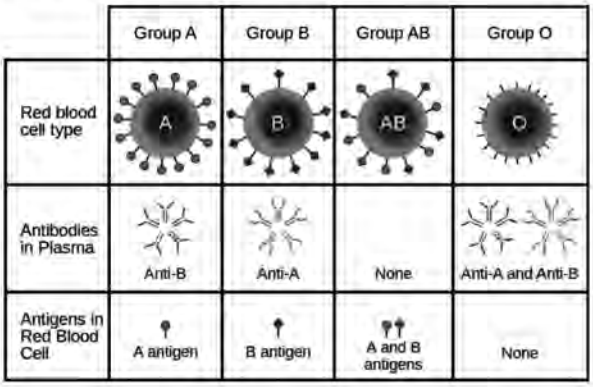


Figure 15.7 Example of blood group incompatibility

For example:

Patient with group A blood: **contains anti-B antibodies**

Donor blood is group B: **contains B antigen**

Antibodies (Anti-B) in group A patient blood will react with the group B antigens in the donor blood causing HAEMOLYSIS

For the DONOR:

CHECK THE GENERAL CONDITION OF THE DONOR:

- No pregnant women, no people under 17 or over 65 years old
- NO fever
- No jaundice in previous 6 months
- No donation of blood in previous 3 months
- BP normal
- No clinical anaemia
- No behaviour risk factors for STI and/or HIV

PROVIDE PRE-COUNSELING FOR THE DONOR (for pre-HIV testing)

- This should be done by staff who are trained to give pre-donor counselling

TAKE BLOOD FROM THE DONOR IF:

- Malaria smear negative
- Hb >11g/dl (Hct >33%) - if patient condition is urgent, can use donor blood if Hb >9g/dL (Hct >27%)
- Cross match shows no clotting
- Hepatitis B and HIV negative (if tested, Hepatitis C and VDRL negative)
- If the recipient is having acute haemolsis, consider testing the donor's G6PD, to prevent more haemolysis in the recipient. If recipient is having blood loss, donor G6PD is probably not needed

Give the donor a drink and tell them to lie down for about 10 minutes after procedure completed.
Give the donor a prophylactic dose of ferrous sulphate and folic acid for 2 weeks.

For cross matching the blood: put one drop of the patient's and one drop of the donor's blood on a glass and mix. If there is clotting do not take blood from this donor for the patient.

Give the blood transfusion to the patient:

Calculate the amount of blood to give:

Adult	1 bag	
Children	< 1yr	15ml/kg
	≥ 1yr	20ml/kg (max of one bag)

Note:
A blood transfusion can be repeated depending on the severity of anaemia. Be careful for pulmonary oedema.

1. **Make sure you are giving the right blood to the right patient**.
2. **Rate of transfusion**:
   The transfusion is usually given over **4 hours, with the following exceptions**:
   - For patients with **low BP and acute bleeding** (until systolic is >90mmHg): give it over 10 minutes.
   - For patients **at risk of cardiac failure** (e.g. heart / kidney problems, chronic anaemia) give it **over 4-6 hours** and consider giving **furosemide** 20mg PO half-way. You can also give 10ml/kg if the patient is old or has malnutrition
3. **When to check vital signs**:
   - Before starting
   - After 5 minutes, then 15 minutes, and 30 minutes
   - Then after every hour until 1 hour post transfusion.

Note:
If severely unwell, have risk factors, pulmonary oedema, or malaria check vital signs every 15 minutes.

4. **Never mix blood with D5W (this can cause haemolysis) or ringer (this can cause clotting): you can mix blood with NSS.**
5. **Never add medication to the blood.**
6. **Do not shake the blood.**
   You can STOP the transfusion after the cells (red part of the blood) has been given, if there are risks for volume overload. Only the red blood cells are needed to increase the Hb. The plasma (clear part of the blood) is less useful for anaemia and increases the volume given to the patient. **Note:** If the patient is bleeding or in shock, then you should give the plasma.

RISKS DURING BLOOD TRANSFUSION

Observe the patient carefully during the blood transfusion. Check vital signs regularly.
It is important to recognise the symptoms of reaction to blood transfusion so you can stop the transfusion and prevent serious complications.

For suspected transfusion reaction:

Stop the transfusion and disconnect the set from the needle / cannula.
Using a new infusion set, keep the line open with fluids unless suspect pulmonary oedema.
Check that the patient received the correct blood / recheck the patient's blood group.
Reconsider indication for transfusion.
If the patient condition is still severe and blood transfusion is needed, find another donor

MOST COMMON CAUSES OF TRANSFUSION REACTION:

1. Haemolysis

SYMPTOMS
Fever, chills, lumbar back pain, anxiety, fast pulse, low BP, dark urine, burning sensation at IV site

TREATMENT
- Stop the transfusion
- Give NSS fast if the patient is going into shock (*see p.16*)

2. Pulmonary oedema

AT RISK
Old people, patients with known heart / kidney problems, or chronic anaemia

SYMPTOMS
Increased respiratory rate, difficult breathing, cough, headache, crepitations/crackles in both lung bases.

TREATMENT *See treatment acute heart failure p.43*
- Put the patient in a sitting position
- Give oxygen if available
- Give furosemide IV adults 40mg, repeat the dose after 30 minutes if no improvement

3. Allergic reactions

SKIN REACTIONS (ANAPHYLAXIS)

SYMPTOMS
- Urticaria, big red itching lesions

TREATMENT
- Give **chlorpheniramine** PO adults 4mg:
  If no other symptoms and the rash resolves in 30 min, consider re-starting the transfusion.
  Discuss with a doctor and OBSERVE CAREFULLY!

MORE SEVERE ALLERGIC REACTIONS

SYMPTOMS
- Oedema difficult breathing, wheezing, high BP then low BP, sometimes diarrhoea and vomiting

TREATMENT
- *See anaphylactic shock, p. 18*

DEFINITION

Acquired immune deficiency syndrome (AIDS) is a collection of symptoms and infections caused by damage to the immune system from the human immunodeficiency virus (HIV) in humans.

- CD4 T-cells are one kind of lymphocyte (WBC) that co-ordinate the immune system's response to certain infections like viruses.
- HIV can infect and kill CD4 T-cells.
- HIV can also kill and infect other kinds of cells.
- When many CD4 T-cells are killed by HIV, the patient cannot fight against infections or some cancers.

Some organisms can only cause disease in people with low immunity; these diseases are called **Opportunistic Infections** (OIs). AIDS is an advanced stage of HIV infection when the infected person develops severe opportunistic infections and even some kinds of cancer.

PROGNOSIS

- Adults infected with HIV will progress slowly towards AIDS and can stay without any symptoms for several years (average 10 years).
- Without treatment, patients who are symptomatic can die in an average of 2 years.
- If an infant contracts HIV from a mother, this course is much shorter. If no treatment, mortality is 50% at 24 months of age.
- People with HIV infection can often live a full and productive life for many years.
    - These patients are diagnosed as **person living with HIV (or PLWH)**.
    - Taking medication can prevent opportunistic infections.
    - Antiretroviral therapy (ART) helps to control the disease and improve the patient's life, but does not kill all of the virus (does not cure HIV infection).

TRANSMISSION AND PREVENTION

Figure 16.1 Transmission and prevention of HIV infection

ROUTE OF TRANSMISSION	PREVENTION
Sexual Contact	Abstain from sexual contact OR Be faithful to one uninfected partner OR Use male or female condoms AND Early diagnosis and treatment of sexually transmitted infections (STI). Post exposure prophylaxis (PEP) (medicine you give immediately after the exposure). In the case of rape PEP may reduce the risk of HIV transmission (*see p.12*)
Contaminated syringes and needles and other sharps e.g. intravenous drug users, health workers, tattoos	Avoidance of injecting drug use Do not share needles and syringes and always use a new sterilised needle and syringe Do not share cutting implements e.g. tattooing needles, ear piercing needles, razor blades Universal precautions for health workers If have occupational exposure PEP may reduce the risk of HIV transmission (*see p.12*)
Infection by blood and blood products e.g. blood transfusion by HIV contaminated blood	Follow protocol for blood transfusion Screening of donors with a questionnaire to assess risk of HIV infection HIV testing of blood donors before transfusion (should be provided with pre and post-test counselling if available), if not available screen the blood but do not inform the donor of the result
Mother to child transmission	*See SMRU Prevention of Mother to Child Transmission (PMTCT) guidelines, Appendix 20*

DIAGNOSIS

The diagnosis is made by HIV testing and confirmation testing.

WHY SHOULD YOU TEST FOR HIV?

1. Screening for blood transfusion

HIV can be transmitted through blood transfusions so it is important to screen all donated blood for HIV. The primary concern is transfusing safe blood NOT the diagnosis of HIV in an individual.

Unless you have voluntary counselling and testing (VCT) provided for blood donors, AND the donor accepts VCT, the screening of blood should NOT be used to diagnose HIV. The purpose of screening is to ensure the blood transfusion is safe.

2. Diagnosis of HIV infection

Before testing, your clinic needs to be able to offer the patient the following:

Figure 16.2 Requirements for HIV testing

CONFIDENTIALITY

The information about a person's status (negative or positive) must never be passed on to anyone without that person's permission. People are better able to discuss their feelings if they know that the counsellor will not tell anybody else without their permission.

PRE-TEST COUNSELLING

This consists of information and support given before the HIV test to enable people to make an informed choice about whether to take the test.

INFORMED CONSENT

After pre-test counselling, the person understands what HIV and AIDS are and what his or her individual risk of HIV are. **The decision to have the test is up to the person.** You have to respect his or her decision and cannot test if the person does not wish to be tested. **Informed consent needs to be obtained from the person, not the relatives.**

POST-TEST COUNSELLING

This is provided after the test result. It is essential to help those with a positive test to cope with the news, to live positively, and to be referred for appropriate clinical care, nutritional support and psychosocial support. Post-test counselling is also important in order to advise those with a negative result about how to prevent HIV infection in the future and to STAY negative.

LABORATORY TESTING

Testing can be done either with rapid tests in the clinic or with ELISA or Western Blot in the hospital. **A minimum of 2 different tests should be used.** To make the right diagnosis, protocols should be followed strictly, and quality must be assured.

REFERRAL FOR APPROPRIATE CLINICAL, NUTRITIONAL, PSYCHOLOGICAL AND SOCIAL SUPPORT SERVICES

There is a lot that can be done for HIV positive persons to provide them with the necessary health and psychosocial care and support. For the camp setting much of this can be provided and links between VCT services and treatment, care and support need to be established. For other sites discuss with the doctor to see what facilities are available if unsure.

SIGNS AND SYMPTOMS

Primary HIV infection:

- This is the stage that begins immediately after the person is infected.
- Clinically the patient can have **acute retroviral syndrome** (fever, rash, enlarged lymph nodes) for some days or weeks.

In primary HIV infection even if the test is negative, the person can transmit the virus to others. The HIV test becomes positive when the body makes antibodies (2 wks to 3 mo after the infection).

Post-acute infection symptoms:
- Symptoms in HIV are used to assess how severe the disease is.

Clinical staging according to WHO (World Health Organisation):

1. **Clinical Stage 1**
   - No symptoms
   - Persistent generalised lymphadenopathy

2. **Clinical Stage 2: Mild Disease**
   - Weight loss 5-10% of body weight
   - Recurrent upper respiratory tract infections e.g. sinusitis, tonsillitis, pharyngitis or otitis media
   - Minor skin, mouth or nail manifestations such as fungal nail infections, recurrent oral ulcers
   - Herpes zoster or history of herpes zoster within the last five years

3. **Clinical Stage 3: Advanced HIV Infection (usually associated with a CD4 of less than 350cells/mm^3)**
   - Severe weight loss >10% of body weight
   - Persistent oral candidiasis
   - Severe bacterial infections such as pneumonia and pyomyositis (infection of muscle)
   - Pulmonary TB: current or within the last year
   - Unexplained diarrhoea for longer than one month
   - Unexplained persistent fever for longer than one month

4. **Clinical stage 4: Severe disease (AIDS) (usually associated with a CD4 of less than 200cells/mm^3)**
   - HIV wasting syndrome (severe malnutrition)
   - Severe disseminated extra-pulmonary TB
   - Severe infections (e.g. cryptococcal meningitis, oesophageal candidiasis, *Pneumocystis carinii* pneumonia (PCP - now known as *P. jirovecii* pneumonia), cerebral toxoplasmosis)
   - Cancers (invasive cervical cancer, lymphoma and Kaposi's sarcoma)

TREATMENT

There are many different parts involved in the treatment of HIV. The following topics will be discussed:
- General management of a patient with HIV
- Anti-retroviral therapy
- Treatment of common HIV related illnesses and opportunistic infections (OI)
- Prophylaxis to prevent OIs
- PMTCT and HIV in pregnancy, *see Appendix 20*

16.1 GENERAL MANAGEMENT

Management should address all the patient's needs, not only medical needs. Many people may be involved in the patient's care, for example a VCT counsellor, medics, RH staff, and community social workers. It is important to keep confidentiality and only share the HIV status with the patient's consent and only if **absolutely necessary** for the care of that person.

MANAGEMENT POINTS

1. Offer and refer to psychosocial support available in your setting (e.g. refer to support groups for PLWHs, follow-up counselling for persons and their family member/s, refer for community support services).
2. Determine the most likely **stage of HIV infection** according to the WHO staging (see above), ask about present symptoms, past medical history and do a physical examination.
3. Look for and treat other **infections** or **symptoms** associated with HIV.
4. Screen for **tuberculosis**:
   a. Check for symptoms of TB
   b. See TB section in Respiratory chapter for the diagnosis of TB
5. Take **blood** for further assessment including FBC, ALT, CD4 count and syphilis serology.

CD4 count

When caring for a person with HIV the CD4 count is a very important test that helps in management. The CD4 count is important because:

- It is the most useful test for assessing immune function and is very important in assessing the patient and the amount of immune suppression.
- Recommendations for antiretroviral treatment and prophylaxis against OIs are based on the amount of immune suppression. Normal laboratory ranges are between 500 to 1400/mm3.

6. Determine the need for **prophylaxis of opportunistic infections** and antiretroviral therapy based on clinical stage or CD4 count.
7. Nutritional support
   a. Provide nutrition counselling.
   b. If available offer the supplementary ration provided by TBBC for all those with chronic illness, including HIV and AIDS.
8. For women and couples **discuss HIV and pregnancy**; refer for discussion of family planning options to prevent unwanted or unplanned pregnancy.
9. Assess for **STIs**: ask about symptoms such as urethral discharge and do an RPR test for syphilis.
10. Provide counselling on **safe water and hygiene** including how to store water safely in the home, hygienic food preparation and handling, and hand washing.
11. Counsel regarding **risk of transmission** of HIV with sexual partners, advise condom use, provide condoms and advise the person on where they can get more condoms.
12. Provide **follow up appointments**: see the person regularly within the first few months after diagnosis to ensure that they are properly assessed, have an opportunity to ask questions and that they are getting all the necessary support.

16.2 ANTI RETROVIRAL THERAPY*UPDATE

Figure 16.3 When to start anti-retroviral therapy (ART) for HIV*update

Adults (including pregnant women) and adolescents	**Initiate ART regardless of WHO clinical stage and at any CD4 count.** **As a priority**, initiate those: • severe HIV clinical disease (WHO clinical stage 3 or 4) • CD4 count ≤350 cells/mm^3
Children and infants	**Initiate ART regardless of WHO clinical stage or at any CD4 count.** **As a priority**, initiate those: • All children under 2 years of age • Children younger than 5 years of age with WHO clinical stage 3 or 4 or CD4 count ≤ 750 cells/mm^3 or CD4 percentage <25%. • Children 5 years of age and older with WHO clinical stage 3 or 4 or CD4 count ≤350 cells/mm^3

There are 4 classes of drugs currently in use:

NRTI's (Nucleoside Reverse Transcriptase Inhibitors): 3TC, d4T, ddI, AZT, TDF, ABC
NNRTI's (Non-Nucleoside Reverse Transcriptase Inhibitors): Nevirapine (NVP), Efavirenz (EFV)
PI's (Protease Inhibitors): Ritonavir, Lopinavir, Atazanavir, Indinavir and Nelfinavir.
INIs (Integrase Inhibitors): Dolutegravir (DTG), Raltegravir

- The best available treatment combines 3 or 4 drugs (usually 2 NRTI's and either an NNRTI or a PI or an INI).
- Such therapy requires close follow-up because of possible side-effects.
- Refer to the ART protocols in your clinic for further information on recommended regime, dosages and potential side effects.

Therapy is life-long. If the drugs are stopped the virus may begin to multiply again. It is important to tell the patient this.

Regular follow-up is important. Monitor if the drugs are taken, the clinical response and the side effects.

VACCINE
At this moment there is no HIV vaccine available.

16.3 HIV RELATED ILLNESS AND OPPORTUNISTIC INFECTION

16.3.1. CHRONIC DIARRHOEA

SIGNS AND SYMPTOMS
Diarrhoea lasting >2 weeks, often accompanied by nausea, weight loss, abdominal cramps and dehydration. Diarrhoea is often intermittent, watery and without mucous or blood. In approximately 50% of cases no cause is found.

TREATMENT
Rehydration (**ORS or IV fluids**). The patient should receive supplementary feeding. Counsel on the importance of hygiene (wash hands, drinking only boiled water and cook well meat and vegetables).

Try to find the cause by stool examination and give specific treatment. If no cause is found:

1. Diarrhoea with blood (dysentery): Treat with **metronidazole**. If there is no response, or when there is fever, add **ciprofloxacin** for at least 7 days (discuss length of treatment with a doctor).

2. Non-bloody diarrhoea: If you suspect worms give **mebendazole or albendazole**. Diarrhoea without blood does not need antibiotics in most cases. In HIV patients consider treating with **cotrimoxazole** for 5 days and/or **metronidazole** for 10 days. If no response after treatment discuss with a doctor.

16.3.2. PROLONGED FEVER

SIGNS AND SYMPTOMS
Fever >37.5°C (lasting > 2 weeks) with no or minimal other symptoms.

CAUSES
There are many different causes of prolonged fever. Children and pregnant women may have different causes from adults. Discuss with the doctor for the complete differential diagnosis (DDx).

- Malaria
- Bacterial infections
    - Pneumonia, UTI, pyomyositis, bacteraemia (bacteria in blood, but no sepsis)
    - TB or atypical mycobacteria
- Viral infections
    - Upper respiratory tract infections (URTI)
    - Cytomegalovirus (CMV) –CMV is very common. It is spread by close contact, blood, intercourse, and mother to child during delivery. CMV is asymptomatic if the immune system is normal. In immunocompromised patients CMV causes symptoms similar to EBV
    - Epstein-Barr virus (EBV) – EBV is very common. It is spread by saliva. EBV causes fever, pharyngitis, lymphadenopathy and fatigue even if the immune system is normal
- Cancer
    - Lymphoma (cancer in the lymph nodes)

TREATMENT
If you find no cause of the fever (Fever DK = fever don't know), treat with:

Amoxicillin: for 7 days — Adult 500mg-1gm TID; Child 80-100mg/kg/day divided TID (maximum dose 500mg/dose or 1.2 gm/day)

OR

Cotrimoxazole: for 7 days — Adult 2 single strength tablets or TMP 160mg/SMX 800mg OD; Child 6-12mg of TMP/kg/day divided BID (maximum dose 960mg TMP per day)

Discuss with doctor or refer for other investigations if no improvement or condition is worsening.

16.3.3. COUGH AND/OR SHORTNESS OF BREATH

SIGNS AND SYMPTOMS
Persistent or worsening cough, shortness of breath, chest pain, difficulty breathing. Treat according to the symptoms and consider:

BACTERIAL PNEUMONIA

SIGNS AND SYMPTOMS	Quick onset, high fever, cough with sputum (may be purulent)
DIAGNOSIS	Clinical diagnosis, CXR if indicated
TREATMENT	Admit to IPD Give **Ceftriaxone** (IV) 1-2 gm IV OD (dose and duration depends on severity and/or culture results)

PNEUMOCYSTIS CARINII PNEUMONIA (PCP)

SIGNS AND SYMPTOMS	Fever, fatigue and weight loss for weeks before developing respiratory symptoms. Followed by dry cough (without sputum), increasing shortness of breath, and minimal or absent chest signs
DIAGNOSIS	Clinical diagnosis
TREATMENT	Admit to IPD: **Cotrimoxazole** (PO): • 120mg/kg, sulfamethoxazole/trimethoprim combination dose, 3-4 divided doses for 21 days **Folic Acid** (PO) • 5mg OD (when taking high dose cotrimoxazole as it decreases the level of folic acid in the body) **If severe dyspnoea (hypoxaemia or low oxygen saturations)** ADD: **Prednisolone** (PO): if severe, use IV hydrocortison first — Child: 1mg/kg BID x 5 days, then 1mg/kg OD for 5 days then 0.5mg/kg OD for 5 days and decrease gradually Adult: 40mg BID x 5 days, then 40mg OD x 5 days, then decrease slowly **Note**: All patients with PCP should start on cotrimoxazole prophylaxis and ART as they are in clinical stage 4.

TUBERCULOSIS

SIGNS AND SYMPTOMS	Signs and symptoms are the same as for patients who are not infected with HIV. One or more of: cough of any duration, fever of unknown cause for > 2 weeks, weight loss in the last 3 months, drenching night sweats. Extrapulmonary disease is more common.
DIAGNOSIS	Manage as TB suspect. **Note**: If HIV positive, sometimes AFB sputum test is negative even in pulmonary TB.
TREATMENT	Same drugs, protocols, duration and side effects as for treatment of other TB patients. Note: All HIV positive patients diagnosed with TB should start cotrimoxazole prophylaxis (does not matter what the CD4 count is).

16.3.4. ORAL CANDIDIASIS (THRUSH)

SIGNS AND SYMPTOMS
White patches or spots on tongue, palate, cheek or gums that can be removed manually (*see Appendix 1*). May have burning sensation in the mouth on eating.

TREATMENT

Nystatin	Dissolve 1 lozenge in the mouth or 1ml of oral suspension (100,000 IU) QID for 7 days (total 400,000 IU/day). Oral suspension: swish in mouth, then swallow
If no improvement:	
Fluconazole (PO)	Adult: 200mg OD x 7 days Child: 3mg/kg OD up to 21 days

16.3.5. OESOPHAGEAL CANDIDIASIS

SIGNS AND SYMPTOMS
Pain and difficulty swallowing food usually associated with oral thrush. This is the major cause of weakness and weight loss in AIDS.

TREATMENT

Fluconazole (PO)	Adult: 200 - 400mg OD x 14-21 days Child: 3mg/kg OD x 21 days

16.3.6. CRYPTOCOCCAL MENINGITIS

SIGNS AND SYMPTOMS
Severe, persistent and untreatable headache, malaise, confusion and convulsions. Symptoms associated with bacterial meningitis are often absent (fever, stiff neck, photophobia, nausea and vomiting).

DIAGNOSIS
Lumbar Puncture: Send CSF for India ink test and/or fungal culture. Screening of serum *Cryptococcal* antigen (Ag) should be done if CD4 count is <100cells/mm^3. If laboratory diagnosis is not possible. discuss with doctor and refer.

TREATMENT

Stage 1: Initiation Phase	**Amphotericin B** (IV) AND **Fluconazole** (PO)	Child & Adult: 1mg/kg OD x 2 weeks Child: 12mg/kg OD (max 800mg/d) x 2 weeks Adult: 1200mg OD x 2 weeks
Stage 2: Consolidation Phase	Fluconazole (PO)	Child: 6-12mg/kg OD (max 800mg/d) x 8 weeks Adult: 400-800mg OD x 8 weeks
Stage 3: Maintenance or Secondary Prophylaxis	Give secondary prophylaxis after recovery: **Fluconazole** (PO)	Child: 6mg/kg OD (max 200mg/d <2yrs: do not stop prophylaxis 2-5yrs: Stop when on ART ≥1 yr and CD4 count >25% 2 separate times 6 months apart Adult: 200mg OD Stop when on ART for ≥1yr and CD4 count >200cells/mm^3 2 separate times 6 months apart

Only start ART treatment 4 weeks after starting antifungal treatment

16.3.7. CEREBRAL TOXOPLASMOSIS

DEFINITION
This is an infection of the brain that is caused by reactivation of the parasite *Toxoplasma gondii* in immunocompromised patients. It causes multiple lesions in the brain. It almost always occurs in patients with a CD4 count <100 cells/mm^3.

SIGNS AND SYMPTOMS
Headache, sometimes with fever. Focal neurological symptoms e.g. one-sided weakness, paralysis, decreased consciousness, new seizures.

DIAGNOSIS
Serum toxoplasma antibodies IgG and IgM
On a brain CT scan you can find 'ring enhancing' lesions in the brain. This is only available at some hospitals.

TREATMENT
If suspect toxoplasmosis because of symptoms, first give cotrimoxazole to see if there is a response. The lesions in the brains should resolve within 3 weeks of starting treatment.

Cotrimoxazole (PO): Child & Adult: TMP/SMX 10mg/50mg/kg/day divided in 2 doses x 6 weeks

Folic Acid (PO): 5mg OD (when taking high dose co-trimoxazole as it decreases the level of folic acid in the body)

Note: All patients with toxoplasmosis should start on ART (as they are in clinical stage 4) but only after at least 2 weeks of cotrimoxazole treatment

16.3.8. PENICILLIUM MARNEFFEI INFECTION (PENICILLIOSIS)

DEFINITION
This is a major cause of HIV associated disease in Thailand.

SIGNS AND SYMPTOMS
Fever, anaemia, weight loss, enlarged lymph nodes and enlarged liver. If the patient has severe disease they may have generalised papular skin lesions. Severe disease can cause death quickly.

DIAGNOSIS
Blood or skin lesions for fungal culture

TREATMENT

Stage 1: Initiation Phase	**Amphotericin B** (IV)	Adult & Child: 0.7mg/kg/day IV x 2 weeks
Stage 2: Consolidation Phase	**Itraconazole** (PO)	Child: 5mg/kg BID x 10 weeks Adult: 200mg BIDx 10 weeks
Stage 3: Secondary Prophylaxis	Start secondary prophylaxis after finishing consolidation phase: **Itraconazole** (PO)	Child: 5mg/kg OD (max 200mg OD) <2yrs: continue prophylaxis, even when taking ART 2-5yrs: Stop when on ART for > 1 year and CD4 count >25% 2 separatetimes 6 months apart Adult: 200mg OD Stop when on ART for ≥1 year and CD4 count >200cells/mm3 2 separate times 6 months apart

16.4 PROPHYLAXIS OF OPPORTUNISTIC INFECTIONS

Each infection makes the PLWH weaker, causing more decrease of the CD4 count. Lower CD4 will decrease immunity and make other infections more likely. That is why it is important to try to prevent and treat infections as soon as possible. Fortunately, some opportunistic infections can be prevented by regularly taking certain drugs. This is called **prophylaxis.**

There are two kinds of prophylaxis:

Primary prophylaxis:	Prevents the first occurrence of an infection.
Secondary prophylaxis:	Prevents new infections in someone who has already had one or more infections and recovered.

COTRIMOXAZOLE PROPHYLAXIS

This prevents *Pneumocystis jirovecii* (previously known as *Pneumocystis Carinii* Pneumonia or PCP) and toxoplasmosis. It is also effective against certain types of bacterial pneumonia and intestinal infections.

1. **Give cotrimoxazole to**:
   - All HIV-exposed infants at 6 weeks of age
   - All HIV-infected children < 5 years
   - All HIV infected people > 5 years with no signs of active PCP AND:
     - CD4 count <350cells/mm^3 OR
     - WHO Clinical Stage 2, 3 or 4 (*see HIV stages, p.147*)
   - HIV infected persons diagnosed with tuberculosis
   - Patients with previous PCP or previously treated toxoplasmosis (=secondary prophylaxis)

If there are signs of active pneumonia, give treatment doses not prophylaxis doses (*see treatment of different opportunistic infections above*).

Dose for cotrimoxazole primary and secondary prophylaxis

Cotrimoxazole (PO) Adult: 2 single strength tablets (=960mg) OD
(*1 single strength tablet = 480mg = TMP 80mg + SMX 400 mg)

Child:	Weight	Syrup (200/40 mg/5 ml)	Tablet 400/80mg
	<5kg	2.5ml	--
	5-15kg	5ml	½ tablet
	15-30kg	10ml	1 tablet
	>30kg	--	2 tablets

Note: If there is allergy to cotrimoxazole use Dapsone Adult: 100mg OD; Child: 2mg/kg OD (maximum 100mg OD). Exclude G6PD deficiency first. In HIV infected pregnant women who need cotrimoxazole prophylaxis use the same dose as other adults.

When to stop cotrimoxazole primary and secondary prophylaxis

- <2yrs: Do not stop prophylaxis
- 2-5yrs: Stop when on ART for at least 1 year and CD4 count >25% 2 separate times 6 months apart
- >5yrs/ Adults: Stop when on ART for at least 1 year and CD4 count >200cells/mm^3, on 2 separate times 6 months apart

Note: If ART not available prophylaxis is life-long

2. Children born to HIV infected mothers

ALL children born to HIV infected mothers should receive cotrimoxazole prophylaxis starting at 6 weeks (*see dose above*).

- If the child is unable to tolerate cotrimoxazole, use dapsone 2mg/kg OD
  - First check G6PD test. If G6PD abnormal discuss with a doctor
- Stop cotrimoxazole prophylaxis when the child is confirmed HIV negative, 6 weeks after stopping breastfeeding

FLUCONAZOLE PROPHYLAXIS

Fluconazole prophylaxis is used only as a **secondary prophylaxis** if the patient has already had cryptococcal meningitis.

1. Give fluconazole to:

- Patients with proven cryptococcal disease and recovered; prophylaxis given after 10-12 weeks of treatment

Dose for fluconazole secondary prophylaxis

Fluconazole	Adult: 200mg OD Child 2-5yrs: 6mg/kg OD (max 200mg)

When to stop fluconazole secondary prophylaxis

- <2yrs: Do not stop prophylaxis
- 2-5yrs: Stop when on ART for at least 1 year and CD4 count >25%, on 2 separate times 6 months apart
- >5yrs/ Adults: Stop when on ART for at least 1 year and CD4 count >200cells/mm^3, on 2 separate times 6 months apart

16.5 PMTCT AND HIV IN PREGNANCY*UPDATE

Refer to the Guideline for Prevention of Mother to Child Transmission (PMTCT), see Appendix 20

17.1 GENERAL DEFINITIONS

Virus:	• A very small and simple infection particle. • They replicate (copy themselves) inside the cells of other organisms. • Examples: HIV, hepatitis B virus, measles. • Anti-viral drugs (e.g. acyclovir) are used against viruses. They may not work well because viruses change quickly and become resistant.
Bacteria:	• A complex infection particle that come in different sizes and shapes e.g. rods (e.g. diphtheria), spheres also known as cocci (e.g. streptococcus pneumoniae) and spirals known as spirochetes (e.g. leptospirosis). • Antibiotics work against bacteria. Like viruses, changes in the bacteria are causing resistance to drugs but it occurs slower than viruses.
Fungus:	• Includes yeasts (e.g. candida), mould (e.g. that grows on food that has not been eaten for too long) and mushrooms. • Antifungal drugs (e.g. fluconazole, nystatin) are used to treat fungal infections. Resistance to anti-fungal drugs also occurs.
Protozoa:	• Organisms made up of one cell. • Examples: malaria, amoeba, giardia, trichomoniasis.
Pathogenic:	• Pathogenic organisms are organisms that cause disease.
Non-pathogenic organism:	• Some micro-organisms live in the body and are a normal part of how the body works (e.g. your gut has lots of bacteria that normally live there and these are called non-pathogenic). These organisms do not cause disease and may actually keep you healthy.
Immune system:	• The process in the body that occurs to fight infection. It does this by increasing the number of white blood cells (WBC). • WBC have many functions including producing antibodies (see below) and toxins to fight the infection. • In some conditions e.g. HIV, diabetes, malnutrition, cancer, the immune system does not work very well (this is known as being **immunocompromised**). These people are more at risk of getting infections.
Antigen:	• Anything that causes the body to make an immune response (the body will produce antibodies against it).
Antibody (also known as immunoglobulin):	• The body makes these as part of the immune response so it can remember the infection particle and fight against the infection in the future. • IgM (immunoglobulin M) antibodies are produced quickly after an infection. • IgG (immunoglobulin G) antibodies are made later and may be found in the blood for a long time.
Immunity:	• To have immunity means that the body has previously been infected or immunised. If the body becomes infected again the body can remember and fight the infection without causing any symptoms/disease.
Infectious:	• Means that it is possible for the infection in a person to be transmitted to someone else e.g. common cold, measles, HIV.
Vaccination (also known as immunization):	• When you inject a small amount of antigen into the body it can produce an immune response (i.e. produces antibodies) but not big enough to cause an infection. The antibodies will fight against the same infection in the future without causing any symptoms and the person will not become ill.
Immunoglobulin:	• Sometimes it is possible to give people antibodies (immunoglobulins) that are already made. When the patient has been exposed to an infection the immunoglobulin can fight the infection e.g. rabies immunoglobulin. • Because these antibodies are not made in the body sometimes the body can fight against them and the antibody will not help the patient. This is why they are only used for special cases when there is a high risk of infection.

17.2 BACTERIAL DISEASES

For bacterial infections it is important to take bacterial cultures before starting antibiotic therapy. Most of the time this will be blood and urine culture, and sometimes on sputum, pus or other. Start antibiotic therapy as soon as possible if a patient is unwell. In unwell or emergency patients do not delay antibiotic therapy if you cannot get the culture (e.g. lumbar puncture). *For fever management in infants**update*, see Appendix 15.*

17.2.1. BACTERIAL MENINGITIS*UPDATE

URGENT REPORT
see Appendix 7

DEFINITION

Bacterial meningitis is a bacterial infection (mostly Streptococcus pneumoniae, Neisseria meningitides or Haemophilus influenzae) of the membranes covering the brain (meninges). The bacteria are transmitted from person to person through droplets. For other causes of meningitis *see viral meningo-encephalitis (p.169 and 195), TB-meningitis (p.85, 156, 157, 195, and 251), Cryptococcal Meningitis (p.151).*

SIGNS AND SYMPTOMS

Young children *see Paediatric Meningitis protocol, Appendix 16*

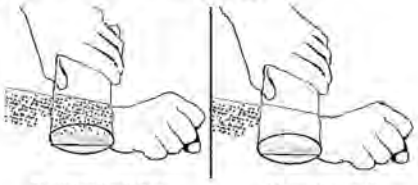
- Fever (38.5°C or more), unwell, drowsy, not sucking well, vomiting, convulsions, coma
- Crying a lot (cannot console) or lying quietly without moving
- Swollen (=bulging) fontanel
- Usually no neck stiffness
- Sepsis: **haemorrhagic (purpura), non-blanching rash** (if put pressure on the rash with a glass the rash will not go away

Older children and adults

- Fever (38.5°C or more), headache, vomiting
- Light hurts the eyes (**photophobia**)
- Neck stiffness
  - move the chin towards the chest: this results in pain and resistance in a patient with meningism
- Positive signs of meningism:
  - **Kernig's sign**: Bend the hip and then straighten the leg: if positive will get pain and resistance
  - **Brudzinksi sign**: Bend head forward: (causes pain) and you can see hips bend
- Convulsions and coma
- Sepsis: **haemorrhagic** (purpura), **non-blanching rash** (if put pressure on the rash with a glass the rash will not go away)

Always think of meningitis in febrile patients with severe headache, confusion, agitation or coma

Figure 17.1 Blanching sign



Positive test (**non-blanching rash**): likely bacterial meningitis

Negative test (**blanching rash**): rash unlikely due to bacterial meningitis

Figure 17.2 Kernig and Brudzinski signs

KERNIG'S SIGN

BRUDZINSKI'S SIGN

Suspect TB meningitis in young patients with neurological signs (e.g. hemiplegia, paraplegia). There may be low grade fever, a gradual onset, or behaviour changes.
Suspect Cryptococcal meningitis if immunocompromised (e.g. *HIV/AIDS, p.151*). Fever may be mild or absent, and there is a severe persistent headache.

DIAGNOSIS

The diagnosis is clinical. If possible, do a lumbar puncture (LP) for a cerebrospinal fluid (CSF). A positive CSF culture confirms the diagnosis of meningitis. Remember to do a malaria blood smear.

Figure 17.3 Contraindications to lumbar puncture

Do NOT perform a lumbar puncture if there are signs of raised intracranial pressure or risk of bleeding:

- GCS <15
- Unequal pupil size
- Non-reactive pupils
- Focal Neurological sign
- Seizure
- Very slow heart rate (<50 in adults)
- Low platelets or a bleeding disorder
- Irregular breathing
- Severe respiratory distress

Lumbar puncture (*see Figure 17.4 for interpretation*):

- When you do a lumbar puncture, you should:
  - Test the opening pressure (can use a manometer or observe how fast the fluid comes out)
  - Check the appearance of the CSF
  - **Send the CSF for culture, if an organism can be found, it will help the treatment plan.**
- If possible, also check:
  - Microscopy for WBC + (if possible) gram stain, Ziehl Neelsen stain, India ink stain
  - Glucose (also check at a similar time as the LP to compare the CSF and blood glucose)
  - Total protein

Figure 17.4 How to interpret CSF results

Cause	Normal CSF	Bacterial	Viral	TB	Cryptococcal
Appearance	Clear	Cloudy	Clear	Slightly cloudy	Slightly cloudy
WBC	<5/mm^3	>200/mm^3 Neutrophils ↑ (May be <100mm^3 in early cases)	>10mm^3 Early infection neutrophils ↑ Late infection Lymphocytes ↑	>10/mm^3 Mostly lymphocytes	>10/mm^3 (may not be raised in HIV/AIDS cases) Mostly lymphocytes
Glucose	> $^2/_3$ blood dextrose	Low	Normal	Low	Low
Total protein	0.15-0.4 g/L	High	High	High	High
Microscopy	None	Pus Gram stain +	None	AFB in ZN stain (but rare)	Positive in India Ink
Opening pressure	20-60 drops/min	High	Usually normal	Variable	High

Note: Do not wait to start antibiotics waiting to do an LP because the patient may die.
If you cannot do an LP but are concerned about meningitis: start antibiotics.

TREATMENT*UPDATE

1. Admit to IPD
2. Antibiotics: duration and choice depend on suspected bacteria or culture result. Empiric choices below.
   - **Ceftriaxone** 2g BID
   - If >60yr consider adding **ampicillin** (to treat *Listeria*). Some bacteria like *S. aureus* (cellulitis) may be susceptible to ceftriaxone. Empiric antitbiotics should treat the suspected bacteria. You should change the treatment depending on the CSF culture results.
3. **Dexamethasone**
   - If given before antibiotic, dexamethasone decreases risk of hearing loss, neurologic complications and death). Dexamethasone does not help if given after the antibiotic.
   - **Adults**: Give 10mg IV QID for 2-4 days. Dexamethasone improves the outcome in adults with *S. pnuemoniae* meningitis.
   - **Children ≥6 weeks old**: Use only if suspect *H. influenzae* (e.g. gram neg coccobacilli on gram stain), give 0.15mg/kg IV QID (max 10mg/dose) for 2-4 days.
   - If suspect another bacteria or if CSF culture is negative for *S. pneumoniae*, stop dexamethasone.
   - **Do not use dexamethasone if you suspect HIV, TB or malnutrition.**
4. Give supportive treatment: fluids and oxygen
5. Treat fever with paracetamol
6. Treat convulsions with diazepam
7. Give special nursing care if the patient is in a coma (*see Coma section, p19*).

PREVENTION

Preventive vaccination can be used to protect individuals at risk (e.g. people without a spleen). Give prophylaxis: **ciprofloxacin** PO STAT for close contacts (family/household). Adults: 500mg; Child: 15mg/kg.

VACCINATION

Some vaccines have been proven to be safe and effective with mild side effects (e.g meningococcal, pneumococcal, and Hib vaccine). In this area there is no routine vaccination for meningitis.

17.2.2. LEPTOSPIROSIS

SURVEILLANCE
see Appendix 7

DEFINITION

Leptospirosis is caused by a spiral bacteria (spirochetes) called *Leptospira*. These bacteria live in animals (mainly rats; also dogs, cats and cattle) and are excreted in their urine. They stay alive in the soil for months. *Leptospira* enter the body by damaged skin, mucous membranes and conjunctivae after contact with contaminated water (e.g. by animal urine) or by close contact with infected animals.

RISK FACTORS

1. Farmers and miners
2. Walking without shoes in rivers, sewage and canals
3. Swimming in rivers and lakes
4. Working in abattoirs (factories where animals are killed for food)

SIGNS AND SYMPTOMS

- Sudden high fever with chills and rigors
- Conjunctiva suffusion (eyes are red, no pus)
- Severe muscle pain (particularly calves) and tenderness
- Headache
- **Other symptoms**: decreased urine production, abdominal pain, nausea and vomiting, diarrhoea, cough and pharyngitis, chest pain, arthralgia (joint pain)

The acute phase lasts 5-9 days and can be very mild or very severe. In many patients the disease stops here. In some patients these symptoms persist or return after stopping for a few days and complications appear.

COMPLICATIONS

1. **Meningitis** with severe bitemporal and frontal headache.
2. **Liver and Kidney failure (Weil's disease)**: high fever over 40°C, jaundice, oliguria/ anuria, (accompanied by haemorrhagic pneumonia, cardiac arrhythmias and circulatory collapse). In some patients you will find an enlarged liver and spleen (hepato-splenomegaly).
3. **Haemorrhagic pneumonia** with acute respiratory distress syndrome: can happen without liver and kidney failure. Haemoptysis and often chest examination is normal (no crepitations).
4. **Uveitis** (very red eye, blurred vision, eye pain, irregular pupil, photophobia, headache).
5. **Liver failure** usually improves. Poor prognosis for kidney failure and respiratory distress syndrome.

DIAGNOSIS

- Clinical, but some investigations could be helpful:
- Dipstick: protein and blood in urine.
- Biochemistry: raised creatinine, CK (creatine kinase) and bilirubin.
- Definite diagnosis by special blood test (serology), but it is not available.

TREATMENT

- Should be started as early as possible, but it is now thought effective also if started late:
- Treat the fever and the pain with paracetamol
- Give IV fluids
- Antibiotics:

Mild infections

- PO **doxycycline** 200mg OD (OR 100mg BID) x 7 days
- In pregnant women: PO **amoxicillin** 1g BID x 7 days
- In children <8yrs: PO **amoxicillin** 25mg/kg BID x 7 days

Severe infections (very unwell or with complications)

- IV **ampicillin**
  - Adults: 2g TID
  - Child: 100mg/kg/day in 3 divided doses
- Change to PO amoxicillin when improved (48 hrs after fever stops - total 7 days antibiotic)

PREVENTION

Collection of rubbish to decrease rat population, educate of people at risk, **doxycycline** (200mg weekly) prophylaxis for high-risk groups.

VACCINATION

There is a vaccine for animals available, but this works only for a few months. There is a vaccine for humans, but it is of limited benefit and is not used in our region.

17.2.3. SCRUB TYPHUS*UPDATE

DEFINITION

Scrub Typhus is a bacterial disease caused by *Orientia tsutsugamushi*, a type of rickettsia. The disease transmitted by the bite of a mite that inhabits moist grasslands and jungle. Rodents are normal carriers. Scrub typhus is common in our region. **Scrub typhus is one of the most common causes of non-malarial fever in the tropics.** If not treated many people recover, but some will die.

SIGNS AND SYMPTOMS

- **Fever**
- Severe **headache**
- Red eyes (conjunctival injection)
- Enlarged, painful **lymphadenopathy** first near the site of the bite, then generalised
- Skin lesion at the site of the mite's bite: small, round, hard red papule. Becomes bigger with a necrotic centre, covered by a black hard painless **eschar**. Look for it especially on the back, under breast, inguinal area and scrotum
- After a few days of fever, a typical (maculopapular) **rash** appears, starting on the trunk and extending to the limbs
- Sometimes signs and symptoms of meningitis or encephalitis
- Rarely atypical bronchitis, enlarged spleen, myocarditis, strange behaviour (neuropsychologic signs) and kidney failure

People living in areas where scrub typhus is common have a less severe illness, often with NO RASH and NO ESCHAR.

DIAGNOSIS

The diagnosis is clinical: history and examination findings suggestive of scrub typhus and a negative malaria smear. Many times there is nothing suggestive of scrub typhus on history or examination. In the presence of a negative malaria smear and no other obvious finding on history and examination, think of scrub typhus.

TREATMENT*UPDATE

- Treat the fever and the pain
- Antibiotic

Doxycycline	Child >8yrs and Adult:	200mg OD (OR 100mg BID) x 7 days
Azithromycin	Pregnant:	500mg on first day then 250mg OD x 4 days
	Child 6mths - 8yrs:	10mg/kg OD x 3 days

Cotrimoxazole, erythromycin, gentamicin and amoxicillin are NOT EFFECTIVE in scrub typhus. If the fever does not decrease after 48 hours treatment: the diagnosis is probably not scrub typhus. Think of other diagnoses (dengue, leptospirosis, typhoid fever, etc.)

PREVENTION

- Control of vector populations and personal hygiene (including de-lousing) are most important
- Avoid mite-infested areas. Use thick repellents and protective clothing
- Shower regularly. Disinfect clothes by washing in hot water or impregnate with 1% permethrin
- If working in high-risk areas, use **doxycycline** prophylaxis (200mg weekly)
- Regular preventive treatment of medical/nursing staff is recommended in endemic areas

VACCINATION

There is no vaccine available.

Murine Typhus:

Another form of typhus is Murine Typhus (or endemic typhus). Symptoms are similar to Scrub typhus: fever, headache, and rash; but are milder. Murine typhus is caused by *Rickettsia typhi* and is transmitted to humans by rat fleas. The vectors are rats, mice and other rodents. Treatment is doxycycline.

17.2.4. TETANUS

SURVEILLANCE
see Appendix 7

DEFINITION

Tetanus is an acute, often fatal, disease characterised by a prolonged contraction of muscles caused by a toxin produced by the bacterium *Clostridium tetani*. Infection generally occurs through contaminated wounds, usually a cut or deep puncture wound. As the infection progresses, muscle spasms in the jaw develop ('lockjaw'). Then the patient develops difficulty swallowing, general muscle stiffness and spasms in other parts of the body. The toxins (or spores) are widely distributed in soil and animal faeces.

Neonatal tetanus is a form of generalised tetanus in newborn infants. It occurs in infants born to mothers who have never been immunised for tetanus. It usually occurs through infection of the unhealed umbilical stump, especially when the stump is cut with a non-sterile instrument.

SIGNS AND SYMPTOMS

Average time between exposure to tetanus and symptoms is 7 days (3 to 21 days)

- Contaminated wound
- Slight fever
- Sweating
- Muscle spasms and stiffness (e.g. lockjaw, opisthotonus)
- Difficulty swallowing
- Generalised muscle spasms

DIAGNOSIS

The diagnosis is clinical and does not depend upon laboratory or bacteriologic confirmation.

TREATMENT

Refer patient to hospital. If unable to go to hospital:

1. Maintain an open airway
2. Keep patient in a very quiet room with minimal people interrupting (sounds can cause additional spasm)
3. All wounds should be cleaned. Necrotic tissue and foreign material should be removed (*see p.273*).
4. Antibiotics:
   - **Metronidazole** IV 500mg TID for 7 days.
   - If needed add **Cloxacillin**: Adult: 500mg QID; Child: 15mg/kg QID for 5 days
   - If the wound was exposed to soil (e.g. wounds on the feet, trauma by wood or bamboo), or if no improvement with cloxacillin Consider adding **ciprofloxacin.** Adult: 500mg BID; Child 15mg/kg BID (max 500mg BID) for 5-7 days or ***gentamicin*** IV if the infection is severe.
5. Supportive treatment:
   - **Diazepam** IV for spasms
   - **Paracetamol** IM/IV for pain
6. **Booster vaccine**: Tetanus toxoid vaccine 0.5ml IM into upper arm or buttock
7. Serotherapy:
   - **Immune Globulin (TIG)** 250 units IM STAT with part of the dose infiltrated around the wound
   - If the injury occurred >24 hours ago, there is serious infection or after burns give **Tetanus Immune Globulin (TIG)** 500 units IM STAT
   - **Note**: Inject vaccine and the immunoglobulin in two different sites. Use separate syringes for each

PREVENTION & VACCINATION (*see Appendix 2 for childhood vaccination schedules, and wounds p.273*)

Figure 17.5 Tetanus post-exposure vaccination recommendations

RISK	**VACCINATION COMPLETE** Last booster was:			**VACCINATION NOT COMPLETE** (< 3 doses)
	< 5 years	**> 5 years**	**> 10 years**	
LOW *	None	None	Booster	Start or complete vaccination (full course of 5 doses)
HIGH **	Antibiotics	Antibiotics Booster	Antibiotics Serotherapy Booster	Antibiotics Serotherapy Start or complete vaccination

* Low risk wound: minor wounds, scratch.
** High risk wound: deep wounds, war wounds, wounds with bone fractures, wounds with devitalised tissue, extensive burns, foreign bodies, wounds older than 6 hours.

17.2.5 TYPHOID FEVER

SURVEILLANCE
see Appendix 7

DEFINITION
Typhoid fever is a bacterial infection caused by *Salmonella typhi* (now known as *Salmonella enterica* serovar *typhi*). It is transmitted by contaminated food, water or dirty hands. The incubation period is 10 - 15 days.

SIGNS AND SYMPTOMS
Typhoid is suspected in a patient with:
- Prolonged fever ≥38°C for more than 7 days.
- No other identified cause of fever and **at least one of the following**:
  - Abdominal pain
  - Diarrhoea or constipation
  - Relative low pulse (bradycardia)

Symptoms are non-specific in the first week, so the diagnosis can be difficult.
Other symptoms: tiredness, headache, dry cough, anorexia.

In the 2nd week:
- Rash (pink spots on the abdomen and the chest, called Rose coloured spots)
- Relative bradycardia (the pulse does not increase with high fever)
- Enlarged liver and spleen (hepato-splenomegaly)

In the 3rd-4th week (**complications** can happen even when the patient has improved):
- Intestinal perforation/bleeding or peritonitis
- Septic shock
- Pneumonia
- Confusion with signs of meningitis

DIAGNOSIS
Typhoid is confirmed by a positive blood (or bone marrow) culture for *Salmonella enterica* serovar *typhi*.
May also get relative leukopenia (normal WBC despite septicaemia).

TREATMENT
- Admit to IPD: give fluids: **ORS** or IV fluids **(NSS or RL)**
- Treat the fever with paracetamol.
- Antibiotics:
  - 1st choice: **Ciprofloxacin** PO — Adult 500mg BID x 5-7days; Child 15mg/kg BID x 5-7days
  - For severe cases/ those who cannot swallow:
    Ceftriaxone IV: — Adult 1g OD x 7 days; Child 50mg/kg OD x 7 days
  - Change to PO ciprofloxacin when condition improving and can take oral antibiotics (total 7 days of antibiotics)

Note: *Salmonella typhi* resistance to ciprofloxacin is seen in this area. If you suspect resistance (poor response to ciprofloxacin) continue treatment longer (for 10-14 days) or use **azithromycin** or **ceftriaxone**.

- If signs of acute abdomen (hard abdomen, severe pain, altered bowel sounds): REFER IMMEDIATELY
- For severe presentations with neurological disorders (hallucinations, altered mental status): **dexamethasone** IV loading dose 3mg/kg in 30 minutes, then 1mg/kg every 6 hours for 2 days

The response to treatment is slow. Patients can still have fever after 4-5 days of treatment. Be patient. If the fever is still high at day 7, consider other diagnosis or suspect resistance to antibiotics.

PREVENTION
Clean water and clean food are important for prevention. Counsel the family and the neighbours to use latrines, wash hands after toilet, and before eating. If you see increased cases, you must notify the public health department to avoid an epidemic.

VACCINATION
There is a live oral vaccine available, but in this area there is no routine vaccination for typhoid fever.

17.2.6 MELIOIDOSIS*UPDATE

DEFINITION
Infection caused by the bacteria *Burkholderia pseudomallei*, which is found in soil and water. Infection happens through the skin, contamination of wounds, ingestion and inhalation.

PATIENTS AT RISK
People with diabetes, alcohol use, chronic kidney disease, chronic lung disease, immunocompromised persons (e.g. HIV, TB) and rice farmers are at risk.

SIGNS AND SYMPTOMS
- Suspect if pain in chest, bone, joints, cough, skin infections, lung nodules, pneumonia
- Usually get symptoms 9-21 days after becoming infected but may be many years later
- Fever and signs of infection depends on the site of infection e.g. pneumonia, osteomyelitis, septic arthritis, cellulitis, skin abscess & ulcer, meningo-encephalitis, brain abscess
- Most common presentation is pneumonia and septicaemia like signs and symptoms
- Can be mistaken as pneumonia or tuberculosis

DIAGNOSIS
Blood and/or sputum culture is a reliable diagnostic tool and usually take 2-3 days to see the growth of bacteria in the culture media. Consider sending urine, pus, throat swab or rectal swab samples for culture. CXR and abdominal/pelvic ultrasound can be used to find internal abscesses.

TREATMENT*UPDATE
- Admit to IPD: give fluids: **ORS** or IV fluids (**NSS**)
- Treat the fever with **paracetamol**.
- Antibiotics (doses for adults), ALWAYS start with initiation therapy:

Initiation Therapy:

Ceftazidime: 2g (or 40mg/kg) TID for 2 weeks
- If suspect neurologic involvement, bone, joint, genitourinary (prostate), or skin/soft tissue infection:

ADD
Cotrimoxazole: 10/50mg/kg (maximum 320/1600mg;
- 4 tablets of 480mg of cotrimoxazole) BID for 2 wks

Maintenance Therapy:

Cotrimoxazole (Trimethoprim+Sulfamethoxazole): 8/40mg/kg BID for 12-20 weeks

PREVENTION
- Rice farmers should wear boots, which can prevent infection through the feet and lower legs.
- Use standard contact precautions (mask, gloves, and gown) to prevent infection.

VACCINATION
There is no vaccine available for melioidosis.

17.2.5. RESISTANT BACTERIAL INFECTIONS

DEFINITION
Antibiotic resistance is when bacteria change so that the antibiotics that we use against them stop working. This is an increasing problem worldwide. Resistance may occur because health care providers prescribe too many antibiotics (e.g. for viral illnesses where antibiotics do not work) or patients do not complete full courses of antibiotics. Being able to buy antibiotics or yaa-chud without a medical prescription is also a big problem causing resistance.

If we over-prescribe and are not careful with antibiotics there will be no antibiotics that work in the future for our children, grand-children, etc.

To stop bacteria from becoming resistant, we need to:
1. Prescribe antibiotics only when needed. **DO NOT** prescribe antibiotics for viral infections.
2. Educate patients not to buy antibiotics or yaa-chuud from the pharmacy/shop.
3. Educate patients to finish the course of antibiotics prescribed even if they feel better.

Bacteria may be resistant to a specific antibiotic, or it may have a special pattern of resistance such as ESBL or MRSA *(refer to infection control guideline):*

ESBL (EXTENDED SPECTRUM BETA LACTAMASE) PRODUCING BACTERIA

DEFINITION
Bacteria that produce ESBL are able to break down antibiotics that have a beta lactam ring. They are resistant to most β-lactam antibiotics (e.g. penicillins, cephalosporins) *(see Appendix 17 for antibiotic classes)*. The main bacteria that produce ESBL are enterobacteriaceae like *E. coli* and *Klebsiella*. Therefore, ESBL UTIs are common.

TREATMENT
If the patient has bacteria that produce ESBL then the patient could become very unwell. It is important to treat that infection with a sensitive antibiotic e.g. gentamicin, ciprofloxacin or meropenem for 7-14 days.

MRSA (METHICILLIN RESISTANT STAPH AUREUS)

DEFINITION
MRSA is a type of *Staphylococcus aureus* bacteria that is resistant to penicillins. This means it is resistant to cloxacillin which is normally used for *S. aureus* infections e.g. cellulitis. It is sometimes found on people's skin and nostrils, does not cause any harm. If someone is unwell/ immunocompromised and they get MRSA in the blood they can become severely unwell.

TREATMENT
Other very expensive antibiotics (e.g. vancomycin, linezolide) are needed to treat MRSA. If MRSA becomes resistant to these antibiotics, there is no other drugs to use.

17.3 PARASITIC DISEASES

17.3.1. LYMPHATIC FILARIASIS*UPDATE

DEFINITION
Lymphatic filariasis is a parasitic disease caused by thread-like worms.
The clinical signs and symptoms can be different in different patients because of:

- parasite differences
- immune reaction to the parasites
- how strong is the infection

The disease is transmitted by mosquito bites (lymphatic filariasis). The parasites (worms) enter the body through the skin, go through the lymph system and settle in lymph nodes. Different forms of lymphatic filariasis along the Thailand-Myanmar border are *Wuchereria bancrofti* and *Brugia malayi*. In other parts of the world, *Onchocerca volvulus* and Loa loa are common but they are not endemic in this area.

SIGNS AND SYMPTOMS

- Maybe asymptomatic (no signs or symptoms)
- Fever, headache, lymphadenopathy, itchy skin (dermatitis), bacterial super-infection
- Swollen lymph nodes mainly in the groin
- Arm, breast, leg or scrotal swelling due to lack oflymph drainage
- Chronic infections lead to:
    - Lymph oedema of the legs
    - Ascites
    - Glomerulonephritis with haematuria
    - Chyluria (passing white urine: urine mixed with chyle (lymph fluid) from ruptured lymph vessels)

COMPLICATIONS
With high eosinophilia, severe pulmonary inflammation can develop, tropical pulmonary eosinophilia *(see p.243)*. Pulmonary eosinophilia presents with dry cough (especially at night), wheeze, dyspnoea, fever and sometimes coughing blood.

DIAGNOSIS

Blood smear, preferably at night between 9pm to 3am, to see microfilariae (young worms) in the blood.
Lymph node biopsy in lymphatic filariasis or specific antibody test.
Urine examination for proteins.

TREATMENT*UPDATE

Basic principles for filariasis patients:

- Wash the affected parts twice daily with soap and clean, cool water, and dry them carefully
- Raise the affected limb at night
- Exercise the limb regularly
- Keep the nails clean
- Wear comfortable shoes
- Treat wounds or abrasions

Acute Attacks:

- Bed rest
- Elevation of affected limb without bandaging
- Cooling of limb
- Pain control with paracetamol, NSAID or tramadol
- Antibacterial or fungal cream if needed
- Paracetamol if fever
- Keep good hydration

After acute attack treat with:

- **Diethylcarbamazine (DEC)** (is available from local hospitals)
- Watch for side effects: fever, headache, myalgia, anorexia, abdominal discomfort
- DEC is effective against microfilariae and adult worms of *Wuchereria bancrofti* and *Brugia malayi*. A single dose kills only 40% of adult worms, but longer dose is not more effective

Dosing (WHO recommendations: https://www.who.int/lymphatic filariasis/epidemiology/treatment/en/)

Adults and children: Single dose of Albendazole 400mg + DEC 6mg/kg
OR
DEC 6mg/kg alone for 12 days

*There are different treatment protocols that can be used, discuss with the doctor.

Note: Do not give DEC during the acute attack.
If there is co-infection with onchocerciasis or loiasis DO NOT use DEC because of severe adverse reactions (skin or eye symptoms, shock).

PREVENTION

- Prevent mosquito bites: use mosquito nets and repellents
- Seasonal mass treatment with diethylcarbamazine (DEC) and albendazole or ivermectin are recommended in areas where filariasis is common to decrease transmission of disease
- Vector control

VACCINE

A vaccine is not available and is unlikely to be developed in the near future.

17.4 VIRAL DISEASES

17.4.1. DENGUE FEVER

SURVEILLANCE
see Appendix 7

DEFINITION

Dengue fever is a viral illness transmitted by the *Aedes* mosquito bite. These mosquitoes bite during the daytime and are more common in the rainy season. Dengue mosquitoes lay their eggs in still water both inside and outside the house (e.g. rain collecting in a tyre or bucket, or water used to flush the toilet)

Dengue can present in 2 ways:

1. **Dengue Fever** (DF)
2. **Severe Dengue**:
   - Dengue Haemorrhagic Fever (DHF): Dengue fever with signs of haemorrhage
   - Dengue Haemorrhagic Shock Syndrome (DHSS): Dengue fever with signs of haemorrhage and shock

You are more likely to get severe dengue if you have been infected with a different strain of the dengue virus before. There are 4 different strains.

SIGNS AND SYMPTOMS

Probable Dengue:

Fever for 2-7 days AND negative malaria smear, no other cause of fever AND **2 of the following**:

- Nausea, vomiting
- Rash (typical rash: red maculopapular or petechial rash on the limbs)
- Muscle aches and pains
- Tourniquet test* positive
- Low WBC, low platelets
- Any warning sign

Warning Signs:

- Abdominal pain or tenderness
- Persistent vomiting
- Fluid overload e.g. oedema
- Mucosal bleeding
- Lethargy, restlessness
- Hepatomegaly >2cm
- High Hct with rapid decrease in platelet count

Severe Dengue:

Severe plasma leakage:

- Shock, fast HR, low BP, Cap refill >2s, cold extremities, fast RR
- Fluid overload causing respiratory distress

Severe bleeding:

- e.g. GI bleeding

Severe organ involvement:

- Liver: AST or ALT ≥1000
- Neuro: impaired consciousness
- Heart and other organs

Note: Shock usually develops on the 3rd or 4th day after the fever has decreased.
****Danger stage is day 3 to day 7****

Other signs and symptoms that can be present:

- Severe headache especially behind the eyes (common)
- Skin rash: diffuse redness on the neck, face and chest
- Lymph node enlargement (lymphadenopathy)

*__Tourniquet Test__: Inflate a blood pressure cuff on the upper arm to between systolic and diastolic blood pressure for 5 minutes. A positive test is: >20 petechiae in a 2.5cm square on the front of the forearm. 20% of patients with a viral illness that is not dengue will have a positive test.

DIAGNOSIS

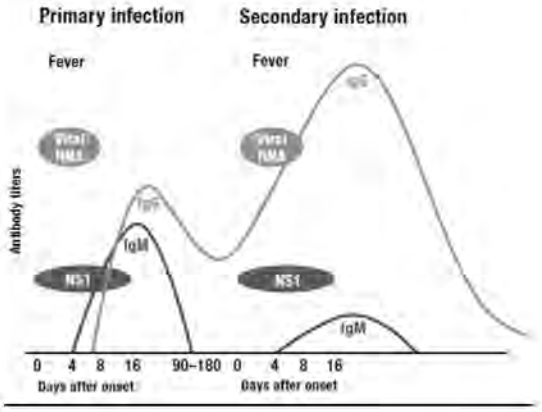
1. CBC may show low WBC, low platelets, high haematocrit in severe dengue (plasma leaks out so the blood is more concentrated with RBC).
2. A drop in Hct suggests that there is some bleeding, this may be hidden e.g. in the abdomen.
3. Dengue serology lab test. How to interpret results (*see Figure 17.6, next page*):
   - **Dengue RDT NS-1**: a protein on the virus, this means current infection with the virus
   - **Dengue RDT IgM**: first antibodies formed against the virus. IgM antibodies develop 3-5 days after onset of infection, and can last up to 180 days
   - **Dengue RDT IgG**: long-term antibodies against the virus, can be present many years after infection

Note: If second dengue infection, the IgG increases much quicker (may be seen at 4-5 days).

Figure 17.6 Interpretation of rapid dengue test*

NS-1	IgM	IgG	Interpretation
+	-	-	Acute infection (0 to 5 days post symptoms) that the body has not made any immune response against
+	+	-	Acute infection that the body has started to make an immune response against, no previous infection
+	-	+	Acute and previous infection but no acute immune response (no IgM antibodies) to this new infection → more likely to be at risk of severe dengue
+	+	+	(uncommon) Acute and previous infection and there is an acute immune response (IgM antibodies) to this new infection → more likely to be at risk of severe dengue
-	+	-	Recent infection that the body has started to build up antibodies to but no acute infection or long-term immunity yet (IgG)
-	-	+	Previous infection (could be many years ago)
-	-	-	Negative = no current or previous infection **Note**: may be false negative if the sample is taken too early: if strong suspicion consider repeating test in 1 week.

Figure 17.7 Immune response to dengue infection



* If only NS-1 rapid test is available (no IgM or IgG), NS-1 positive is treated as acute infection

TREATMENT

There is no drug to cure dengue. Treatment is to prevent complications.

1. **Dengue Fever**
   - Treat the fever with **paracetamol**.
   - **Do not give ASA or ibuprofen - may make potential bleeding from low platelets worse.**
   - Hydration: start with **ORS**. If the patient is unable to drink, start an infusion of NSS. (*see Figure 17.8, see Appendix 8 for ORS preparation.*
   - Monitor the vital signs and the urine output and observe for signs of shock, especially at day 3-7 or when the fever decreases.
2. **Severe Dengue**
   - Treat the fever with **paracetamol**.
   - **Do not give ASA or ibuprofen - can make bleeding from platelet problem worse.**
   - Hydration: *See Figures 17.8 and 17.9 next pages.*

If you notice increased cases, inform the local public health department. A rapid response can avoid an epidemic.

PREVENTION

The *Aedes* mosquito bites during the day. IPD patients should stay under the mosquito net even during the day, to prevent transmission to others. It likes to lay eggs in still water. Watch for still water in pots, tires, etc and remove the water.

Protection for yourself:

1. Long-lasting, impregnated bed nets for those who sleep in the daytime (e.g. patients in IPD)
2. Long sleeves, trousers, socks
3. Insect repellents
4. Burning mosquito coils

Protection for your community:

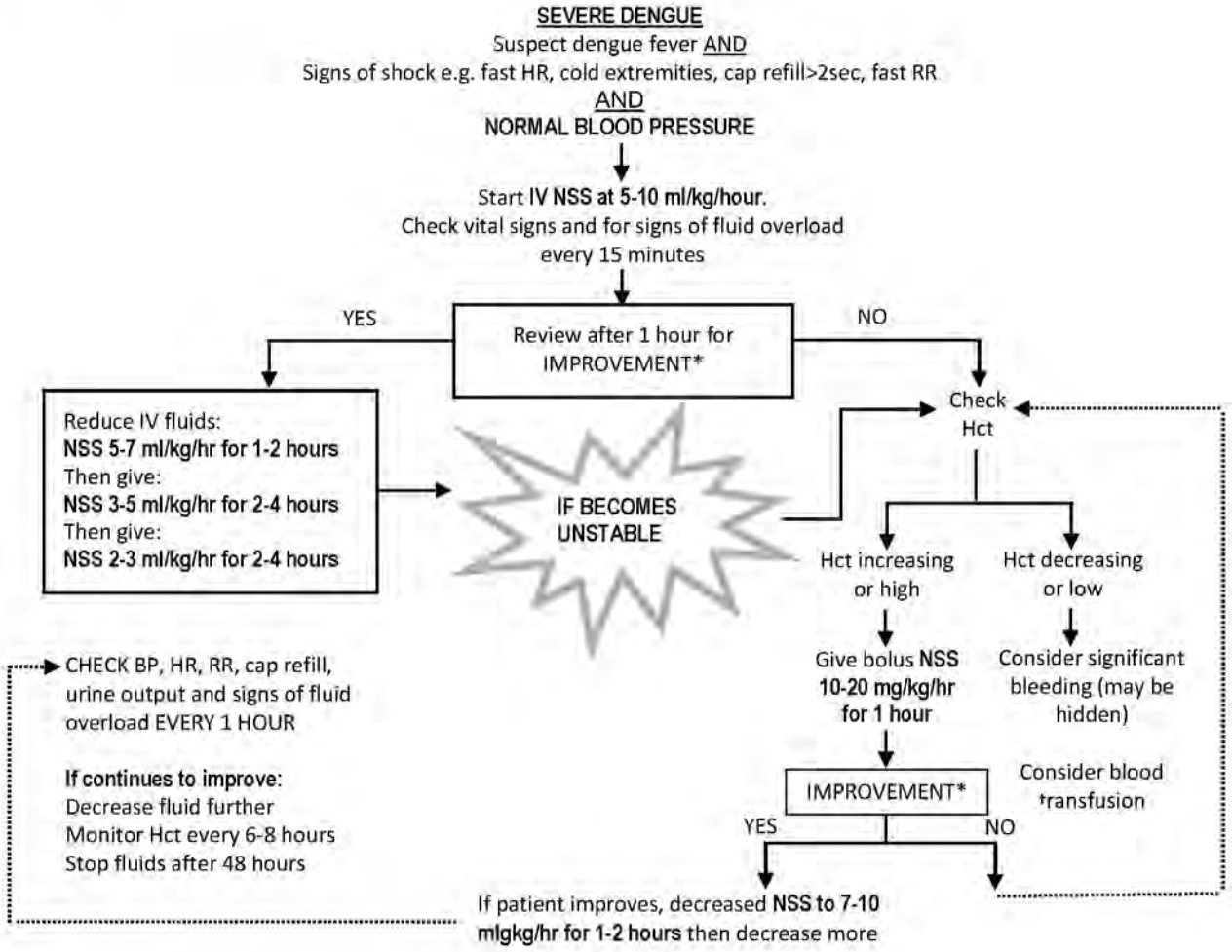
1. Covering containers that have water
2. Avoid leaving containers outside that can fill up with rain water e.g. turn buckets upside down
3. Empty containers (e.g. buckets, tyres) that collect water e.g. after it rains
4. Clean drains from leaves so that they do not block and water does not drain away
5. Killing the mosquito larva in the water e.g. putting abate bags in containers
6. If have still water that is difficult to cover e.g. water used to flush toilet you can leave the tap dripping slowly, this moves the water so the mosquito does not want to lay it's eggs there

It is very important to try to keep patients with dengue under a bed net in the day time so that they do not get bitten by mosquitoes and transmit the dengue to other patients and staff.

VACCINATION

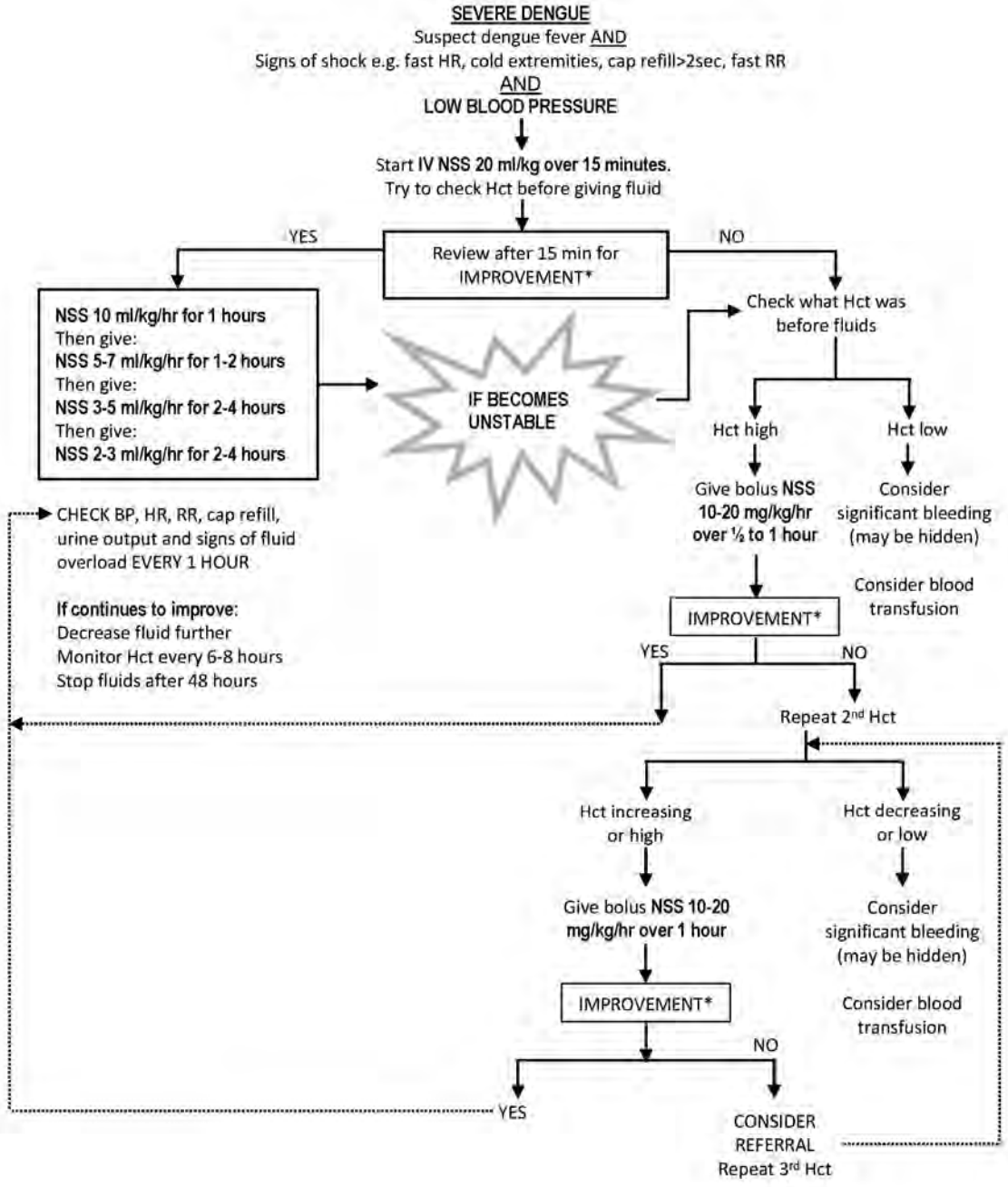
There is no vaccine available in Thailand or Myanmar.

Figure 17.8 Treatment of Severe Dengue with NORMAL blood pressure



* Check BP, HR, capillary refill and urine output

Figure 17.9 Treatment of Severe Dengue with LOW blood pressure



17.4.2. CHIKUNGUNYA*NEW

URGENT REPORT
see Appendix 7

DEFINITION
An acute viral infection that is transmitted by the mosquitoes Aedes aegypti and Aedes albopictus. These mosquitoes also transmit dengue and Zika viruses. The incubation period is 3-7 days (up to 14 days) like dengue virus.

SIGNS AND SYMPTOMS

Most common symptoms
- Sudden onset of high fever
- Joint pain (hands, wrists, shoulders, ankles). This may be the first symptom, even before fever (70% of cases)
- Rash 3 days after illness starts but this can be different between patients. Starts on limbs and trunk. Can cause bullous lesions in children

Other symptoms
- Headache
- Face swelling (not oedema)
- Nausea, vomiting, diarrhea
- Lymphadenopathy (cervical)
- Conjunctivitis

COMPLICATIONS
- Respiratory failure
- Myocarditis or heart failure
- Acute hepatitis
- Renal failure
- Bleeding
- Meningoencephalitis or seizures
- Eye problems
- **Chronic arthritis or joint pain**

Figure 17.10 Bullous lesions on an infant with chikungunya infection

DIAGNOSIS
- PCR (1 ml in EDTA tube) up to day 7. Do not take PCR sample
- if symptoms are >7 days because it might be negative.
- Rapid diagnostic tests are available (check with laboratory)

TREATMENT
1. Supportive treatment only
2. **Paracetamol** for pain
   - If pain is not controlled with paracetamol, add **NSAID** or **ASA**. Avoid these drugs if you suspect dengue because it can affect the platelets and increase the risk for bleeding
3. **Tramadol** can be used for severe pain
4. For chronic arthritis:
   - Prednisolone (should NOT be used during the acute infection) – deworm before starting treatment
   - Methotrexate if prednisolone is not helping
   - Avoid using NSAID (gastritis) or Tramadol (addiction) for long duration

PREVENTION
Same as for dengue, *see p.166*

17.4.3. ENCEPHALITIS

DEFINITION

Acute inflammation of the brain commonly caused by a viral infection (e.g. herpes simplex). Sometimes encephalitis may be a complication of other infections such as rabies, measles, syphilis or toxoplasmosis. One important form of encephalitis is **Japanese encephalitis**.

- This is the most common encephalitis in South-East Asia, India and areas in the Southern Pacific.
- Transmission to humans is from a mosquito bite (in rice fields)
- The virus can live in birds and pigs
- Every year there are 30,000-50,000 cases
    - 30% will die
    - 30% will have severe neurological problems
- After infection there is lifelong immunity.

SIGNS AND SYMPTOMS

The majority of infections do not cause any symptoms.

- Headache and fever may be the only symptoms for 1-6 days
- Other signs can be:
    - Photophobia (fear of strong light)
    - Weakness or hypertonia
- Neck stiffness
- Convulsions

COMPLICATIONS

Can progress to:

- Paralysis, seizures
- Coma, death

Neurologic problems:

- Hemiparesis, deafness, or developmental delay
- Unstable emotion

DIAGNOSIS

Lumbar puncture. Specific antibodies can be found in the CSF (this will need to be investigated in a special laboratory). Blood glucose, malaria smear (to differentiate from cerebral malaria).

Do NOT perform a lumbar puncture if there are signs of raised intracranial pressure or risk of bleeding (*see Figure 17.3, p.156*):

- GCS <15
- Unequal pupil size
- Non-reactive pupils
- Focal Neurological signs
- Seizure
- Very slow heart rate (<50 in adults)
- Low platelets / bleeding disorder
- Irregular breathing
- Severe respiratory distress

If you cannot perform a lumbar puncture but you are concerned about encephalitis or meningitis, start antibiotics immediately, then do the lumbar puncture later if possible.

TREATMENT

1. Antiviral treatment:
    - If available treat with IV acyclovir – but it is very expensive. Other options include PO valacyclovir (a pro-drug of acyclovir which acts faster than acyclovir) or PO acyclovir
2. Symptomatic treatment:
    - Pain relief (*see p.31 and 224*)
    - For seizures (*see p.21*)
    - See coma section for treatment of comatose patients (*see p.21*)
    - Physiotherapy: massage, move the limbs to preserve muscle tone and prevent contraction
    - If you cannot exclude bacterial meningitis, treat with appropriate drugs for bacterial meningitis until a definitive diagnosis can be made (*see p.156*)

PREVENTION

Mosquito (vector) control is not a solution in many areas, as there are too many breeding sites (irrigated rice fields) in our area. In some places alternate wetting and drying of the rice fields have succeeded in reducing vector populations. Personal protection (e.g. using repellents and/or mosquito nets) could prevent transmission of the virus. In outbreaks, one of the measures is to eliminate the pig population.

VACCINE

A Japanese encephalitis vaccine is available, *see Appendix 2 for vaccination schedules in Thailand and Myanmar.*

17.4.4. MEASLES

URGENT REPORT
see Appendix 7

DEFINITION
Measles is a very contagious viral infection that is spread by inhalation of respiratory droplets from infected individuals. It is common in childhood and can result in severe complications. Mortality from measles can be up to 30%, mostly due to pneumonia. There is no treatment for the disease itself. The main goal is to decrease mortality by preventing and treating the complications of measles. Malnourished children are especially at risk from the complications of measles.

SIGNS AND SYMPTOMS

Prodromal/ Catarrhal phase (2-4 days):
- Fever (>38.5°C) more than 3 days, AND
- Red eyes (Conjunctivitis), runny nose, cough.
- Sometimes white spots on the mucosa of the mouth (Koplik's spots).

Eruptive phase (4-6 days):
- After two to three days, red spots appear on the whole body (red rash), they blanch (disappear with pressure e.g. from clear glass unlike a meningitis rash), begins on forehead then spreads down to neck, chest then abdomen and legs.
- As the rash worsens the initial symptoms improve
- The rash goes away around day 5 in the same order that it appears (head to feet)

Post eruptive phase (1-2 weeks):
- Skin desquamation – skin looks striped

Note: When adults get measles, they can be unwell, more unwell than children.

COMPLICATIONS
- Pneumonia
- Otitis Media
- Diarrhoea leading to dehydration and malnutrition
- Purulent conjunctivitis, keratitis
- Corneal ulceration leading to blindness (increased risk when Vitamin A deficient)
- Encephalitis
- Acute malnutrition
- Death (mortality is higher in adults than infants)

DIAGNOSIS
This is a clinical diagnosis. A serum blood can be sent for measles IgG and IgM antibodies for confirmation.

TREATMENT
There is no treatment for the disease itself. The aim of treatment is to prevent complications:
- Treat the fever, diarrhoea and dehydration with **paracetamol** and **ORS**
- Oral hygiene by rinsing mouth
- Give **treatment dose of vitamin A** and repeat day 2 and day 8
- Daily eye wash. Treat conjunctivitis with **Terramycin Eye Ointment (TEO)**
- Treat secondary infections: pneumonia, *see p.240,* otitis media, *see p.58*
- Encourage eating and drinking to avoid dehydration and malnutrition. Advise the mother to continue breast-feeding and to give normal food to older children
- If the measles case is staying IPD and not isolated, we should try to prevent measles in the exposed patients. Vaccinate all other unimmunised children > 6 months. Children and adults who have not had measles infection should also receive the vaccine

PREVENTION = VACCINATION
Measles or MMR (measles, mumps, rubella) vaccine. *See Appendix 2 for childhood vaccination schedules.*

Suspected cases should be reported to the local health department.
There is a high risk of epidemic.

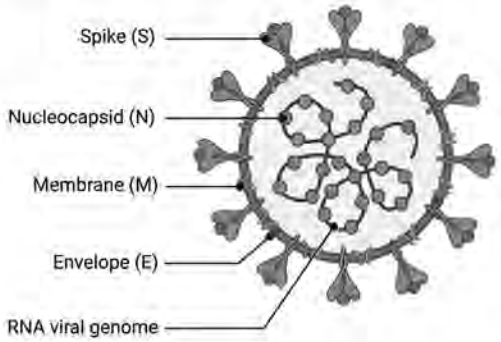
17.4.5. CORONAVIRUS*NEW

URGENT REPORT
see Appendix 7

Coronaviruses can cause different infections:
- Common cold
- In 2002, the first cases of SARS (Severe Acute Respiratory Syndrome) were seen in China.
- In 2012, the first cases of MERS – Middle East Respiratory Syndrome were seen in Saudi Arabia
- In 2019, the first cases of SARS-CoV-2– Severe Acute Respiratory Syndrome 2 (COVID-19) were seen in China.

SARS-COV-2 (COVID-19)

Figure 17.11 Coronavirus Structure



DEFINITION

COVID-19 virus is most genetically related to some bat coronaviruses, but we do not know if there is direct transmission from bats. Human to human transmission is mainly by respiratory droplets. The coronavirus is found in breastmilk, sputum, eye secretions, semen, blood and stool but it is not clear if COVID-19 can be transmitted by breastfeeding, fecal-oral or sexual intercourse.
The incubation period is up to 14 days.

The risk of transmission is higher with close contacts.
Close contact situations are:
- Household
- Health care work where personal protective equipment (PPE) is not used
- People in close contact in confined areas where wearing masks and handwashing are not always available (e.g. prisons, factories, social or religious gatherings, inside a mini-bus)

All microbes (viruses, bacteria, fungus) can be on environmental surfaces (e.g. tables, door handles) from hours to days. **This is what is known from the current research**:
If NO disinfectant is used, COVID-19 can be on surfaces up to 1 week.
If disinfectants ARE used, viruses related to COVID-19 were inactivated within 1 minute.
The inactivation rate depends on which disinfectant you use and the characteristics of the virus or bacteria/fungus. Simulated sunlight (UVB more than UVA) inactivated COVID-19 virus within 15-20 minutes.

SIGNS AND SYMPTOMS

Most common (>50% of cases)
- Cough
- Fever (some have low grade or no fever)

Less common (10-50% of cases)
- Muscle pain
- Headache
- Dyspnoea
- Sore throat
- Diarrhoea
- Nausea and vomiting

Uncommon (<10% of cases)
- Loss of smell or taste
- Abdominal pain
- Runny nose

Even though children are usually asymptomatic or have only mild infection, severe cases in children have been reported.

COMPLICATIONS
- Pneumonia, respiratory failure
- Heart problems (e.g. arrhythmia, cardiomyopathy, shock)
- Pulmonary embolism and stroke
- Severe inflammation (e.g. prolonged fever, prolonged increased ferritin – if test is available, or very sick like sepsis)

DIAGNOSIS

Use the case definition to find suspect cases.

- PCR (from a nasopharyngeal swab/NPS). **An NPS taken >7 days after onset of symptoms might be FALSE negative**
- Laboratory abnormalities: Low WBC, high AST and/or ALT, high LDH, high CRP
- Troponin may be helpful to detect heart complications and risk for severe infection
- ECG if chronic heart problems or if heart complication is suspected
- Chest X ray findings are late, so cannot be used to help diagnosis
- Not usually available: Chest CT may have 'ground glass opacities'. Chest CT is best used for management, not diagnosis

RISK FACTORS FOR SEVERE DISEASE

- Higher risk: older age, cancer, cardiovascular heart disesae, chronic kidney disease, COPD, obesity, smoking, and diabetes
- Possible higher risk (need more evidence): asthma, stroke, HBP, immune suppression, liver disease, overweight, pregnancy, and thalassaemia
- Lab: CRP >100mg/L or absolute lymphocytes < $0.8 \times 10^6/\mu L$

TREATMENT

The appropriate treatment for COVID-19 is still under investigation.

1. All cases should be reported per local protocol to the public health department.
2. If not already done, **isolate** the patient.
3. Give **supportive care**: supplemental oxygen to keep SpO2 ≥90%. If the SpO2 stays <90%, discuss with the doctor. The prone position can be used in alert patients. This position may improve oxygenation.
4. Continue chronic medications (e.g. ACE inhibitors like enalapril, cholesterol lowering drugs, NSAIDS). If there is anorexia or low appetite, adjust diabetes medication to keep a normal blood glucose. It is important to continue good control of the chronic medical problems while the patient is unwell.
5. **Paracetamol** for fever or pain. Avoid NSAIDS, but if you cannot avoid it, use the lowest dose needed.
6. **Avoid nebulisers** because of the risk of putting virus into the air (aerosolization). Use inhaler instead.
7. **Dexamethasone** 6mg OD for 7-10 days for severely ill patients. Alternative treatments are: total daily doses of hydrocortisone 150mg or prednisolone 40mg (less evidence for these treatments). Consider de-worming before starting steroid treatment.

Pregnant and breastfeeding women and immunosuppressed persons should receive the same management and supportive care as non-pregnant persons.

PREVENTION

- Mothers with COVID-19 produce antibodies in their breast milk against the virus, and should not be separated from their babies. The protection of breastfeeding is greater than the risk.
- Infection control and use PPE, *see p.6.* N95 mask needed only for aerosol generating procedures.
- No vaccine is available as of November 2020.

For regular updates, please refer to the following websites:

- Review of COVID-19 treatment recommendations that are updated regularly: https://www.bmj.com/content/370/bmj.m3379
- WHO Thailand coronavirus site: https://www.who.int/thailand/health-topics/coronavirus
- WHO technical guidance: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance

SARS-COV-1 (SARS) **THIS SECTION IS INCLUDED FOR INFORMATION**

DEFINITION

In 2002 a coronavirus similar to the COVID-19 virus emerged in China. Symptoms and management were similar but it was more deadly than COVID-19. The outbreak was contained in 2003 and there have been no cases since 2004. The incubation period is 2-7 days and most people will be symptomatic in 10 days.

SIGNS AND SYMPTOMS

Asymptomatic infections are NOT common. Children have more mild illness.

Initial symptoms last approximately 3-7 days. A respiratory phase develops after day 7 and may progress to respiratory failure.

Most common (>50% of cases)
- Fever
- Cough
- Chills, rigors

Less common (10-50% of cases)
- Muscle pain
- Dyspnoea, pleuritic pain
- Headache
- Diarrhoea

In pregnant women spontaneous abortion, preterm delivery and SGA infants are common.

DIAGNOSIS
- PCR from 2 sites (respiratory, stool, or blood) as early as possible during the illness. If symptoms continue, repeat after 5-7 days.
- Laboratory abnormalities: Low WBC, high ALT, high LDH, low platelets.
- Chest XR may be normal or show pneumonia.
- Acute and convalescent serology tests (to look for IgG and IgM antibodies after infection) are the most sensitive for SARS diagnosis.

TREATMENT
- All cases should be reported per local protocol to the public health department
- Treatment is the same as for COVID-19
  EXCEPT
- **DO NOT use steroid medications**

PREVENTION
Same as for SARS-CoV-2.

17.4.6. POLIOMYELITIS

URGENT REPORT
see Appendix 7

DEFINITION
Poliomyelitis is an acute viral infection. It infects the spinal cord of a patient and causes paralysis. Transmission from human to human is by contact with stool (stool-hand-oral or eating food or drinking water that is contaminated by stools). The disease can be prevented by a polio vaccine.

SIGNS AND SYMPTOMS
- Most of the infected patients have no symptoms
- **Non paralysis form**: fever, muscle pain, headache, vomiting, backbone pain, usually recovery within 10 days
- **Paralysis form**: rapid (low tone) paralysis on one side of the body. Starts at the legs and goes to the head. The muscles become soft and cannot get reflexes. Sensation is normal. Respiratory muscles paralysis can cause death

DIAGNOSIS
The diagnosis is clinical. Suspect poliomyelitis in all patients with acute paralysis.
Polio virus can be detected in stool samples, need 2 samples 48 hours apart.

TREATMENT
- Keep in IPD, bed rest.
- Treat the pain.
- Prevent sores.
- Physiotherapy to prevent wasting of muscles and stiffness.

Do NOT give any IM injections to a patient with suspected poliomyelitis in the febrile phase.
You will make the (paralysis) polio worse.

PREVENTION & VACCINATION
- Oral polio vaccine is available, *see Appendix 2 for childhood vaccination schedules.*
- Report suspect cases to the local heatlh department. Vaccinate all children <5yr living in the same area of a suspected case even if they were already vaccinated.

17.4.7. RABIES*UPDATE

DEFINITION
Rabies is a virus and infects animals (e.g. dogs, cats, bats) and humans. It is transmitted by close contact with saliva from infected animals (bite, scratch, licks on broken skin, and mucous membranes). After symptoms start, both animals and humans will die. If the infection is treated soon after transmission and before the symptoms start, rabies can be prevented by post exposure vaccination.

SIGNS AND SYMPTOMS
Time between exposure to rabies and symptoms is 1-3 months but can be a few years depending on bite size.

- Itching, pain or numbness at the site of the bite (starting 20-90 days after the bite. This time can be longer or shorter)
- Fever chills, weakness, headache
- **Furious rabies**: signs of hyperactivity, agitation, muscle spasm, fear of water (hydrophobia) or;
- **Paralytic rabies**: paralysis spreading from the bitten area
- Partial paralysis progresses to complete paralysis, then coma and death in ALL cases, usually from respiratory failure. Death occurs during the first 7 days of illness if there is no intensive care

DIAGNOSIS
This is a clinical diagnosis. Think of rabies if there is a history of an animal bite or contact with broken skin, plus neurological features.

TREATMENT
There is no treatment for rabies available to a person who is showing signs and symptoms of a rabies infection. In this case, treatment is symptomatic and palliative (e.g. relieve pain with painkillers or diazepam. *See pain p.31 and palliative care p.224.*

Symptomatic disease can be prevented by:

1. **Local wound care**
   - Wash and flush a wound or point of contact:
     - For skin: wash with soap or detergent and a lot of running water for 15 minutes. Apply ethanol or povidone iodine.
     - For mucous membranes e.g. eyes/mouth: rinse with clean water or NSS
   - If the wound is a bite: excise the necrotic tissue. Suturing (closing the wound) should be avoided if possible or should be re-assessed at 48-72 hours. Rabies immunoglobulin must be applied before any suturing.
   - Give a tetanus booster and antibiotics (*see wound care p.273 and tetanus p.160*) to treat other infections

2. **Post-exposure prophylaxis (PEP) treatment for rabies**
   - Treatment depends on when the last tetanus vaccination was given
   - If already received pre-exposure vaccination (3 injections), then give only post-exposure vaccine
   - If no previous pre-exposure vaccination, give rabies vaccine and rabies immunoglobulin (RIG), *see next page for vaccine schedule*)

If the rabies vaccine or immunoglobulin are not available at your clinic refer to hospital. Below is a recommendation for treatment if available but check your local protocol. Pregnancy or infancy are NEVER contraindications to rabies post-exposure treatment.

Figure 17.12 Categories of exposure for rabies treatment from WHO 2018

Category I	Touching, feeding of animals or licks on intact skin	**no PEP treatment**
Category II	Minor scratches or abrasions without bleeding, or licks on broken skin and nibbling of uncovered skin	**Rabies vaccine immediately**
Category III	Single or multiple transdermal (through the whole skin) bites, scratches or contamination of mucous membrane with saliva (i.e. licks)	**Rabies vaccine immediately. Give RIG no previous rabies vaccination. RIG not needed if already had vaccination**

Anti-rabies vaccine should be given for any patients in Category II and III exposures as soon as possible.

Immunosuppressed patients e.g. HIV, malnutrition should be evaluated case by case. They should receive the pre-exposure vaccination course. If they are exposed to rabies RIG is recommended even if already vaccinated. This immunoglobulin can be given within 7 days of potential exposure to the rabies virus.

Start rabies prophylaxis immediately. Do not delay by dog observation when rabies is suspected.

HOW TO ADMINISTER RABIES VACCINATION

- Give vaccine intramuscular (IM) or intradermal (ID).
- *See below for the dose,* but you can also use the product information (comes with the vial) for dosing

For Intramuscular (IM): Use one whole vial of the vaccine. **Do not inject into the buttock region.** Use the shoulder muscles (deltoid). For children < 2 years old, give the vaccine in the anterolateral thigh.

For intradermal (ID): Use 0.1 ml into the deltoid. Less volume is needed for ID injections so the cost of vaccine is less (by 60% to 80%). For children < 2 years old, give the vaccine in the anterolateral thigh.

VACCINE SCHEDULE*UPDATE*

PRE-EXPOSURE PROPHYLAXIS: (PrEP vaccination before any animal bite)

IM regime:	Day 0:	One vaccine vial	(deltoid muscle of one arm)
	Day 7:	One vaccine vial	(deltoid muscle of one arm)
ID regime:	Day 0:	0.1ml per arm	(two arms)
	Day 7:	0.1ml per arm	(two arms)

REMEMBER

use RIG if the exposure is category III and no PrEP

FOR POST-EXPOSURE PROPHYLAXIS (PEP): (vaccination after animal bite)

If no previous vaccine or not sure (e.g. No PrEP), can use any of the following regimens:

2-sites ID on days 0, 3, 7
OR
1-site IM on days 0, 3, 7 and between days 14-28
OR
2-sites IM on day 0 and 1-site IM on days 7 and 21

If have previous vaccine (finished rabies PrEP or had rabies PEP >3mo before):

1-site ID on days 0, 3
OR
4-sites ID on day 0
OR
1-site IM on days 0, 3

Note:

- Staff who give the vaccine must be trained to give intradermal injections
- Keep proper conditions for vaccine storage
- Decide the duration of maximal vaccine storage after use (discuss with Safety team)
- Make sure you have the 1 mL syringe and short hypodermic needles to give the intradermal vaccine

HOW TO ADMINISTER RABIES IMMUNOGLOBULIN (RIG):

Infiltrate with RIG into the depth of the wound and around the wound. As much as anatomically feasible should be infiltrated around the wound. Any remainder should be injected at an intramuscular site distant from that of vaccine inoculation e.g. into the anterior thigh.

Volume of RIG: 20IU/kg for Human RIG or 40 IU/kg of Equine (horse) RIG. The total recommended dose should not be exceeded. If the calculated dose is insufficient to infiltrate all wounds, sterile NSS may be used to dilute it 2 to 3 fold so that the immunoglobulin gets to all areas.

PREVENTION AND VACCINATION

- Prevent exposure to infected animals.
- Pre-exposure rabies vaccination should be considered for professionals (e.g. veterinarians, animal handlers or wildlife officers) who have a constant risk of exposure to rabies.
- Rabies can be prevented by post exposure vaccination within days of exposure (*see above*).

17.5 MIXED ORGANISMS

17.5.1. PAROTITIS

DEFINITION
Swelling of the parotid gland (glands that produce saliva that are located below the mouth and in front of the ears). Parotitis can be caused by different organisms. Signs and symptoms, and treatment depends on the cause.

Acute Bacterial Parotitis:	
CAUSE:	Mostly caused by *Staph Aureus* and mixed oral bacteria
SIGNS AND SYMPTOMS:	Painful swelling, fever
TREATMENT:	**Cloxacillin** AND **Metronidazole** PO or IV depending on severity
Mumps:	**MUMPS SURVEILLANCE,** *See Appendix 7*
CAUSE:	Mumps virus
SIGNS AND SYMPTOMS:	Pain and swelling usually on both sides of the neck lasts 5-9 days, malaise, anorexia, fever, orchitis (painful swelling of testicles), rash, *see Appendix 1*
TREATMENT:	Symptomatic for pain and fever, soft diet
PREVENTION:	Mumps vaccine (MMR)
Extrapulmonary TB:	
CAUSE:	TB
SIGNS AND SYMPTOMS:	Chronic non-tender swelling of parotid gland, or lump noted in gland, may have other symptoms of TB
TREATMENT:	See suspect TB case management *see p.255*
HIV Parotitis:	
CAUSE:	HIV
SIGNS AND SYMPTOMS:	Non-painful swelling of gland, may have other HIV symptoms
TREATMENT:	Anti-retroviral therapy
Autoimmune Parotitis:	
CAUSE:	The body causes its own reaction e.g. Sjorgen's disease
SIGNS AND SYMPTOMS:	Recurrent or chronic swelling of one or both glands with other symptoms of the suspected autoimmune disease.
TREATMENT:	Specific treatment for auto-immune disease
Melioidosis:	
CAUSE:	*Bulkholderia pseudomallei*
SIGNS AND SYMPTOMS:	Acute, subacute, or recurrent swelling of the parotid gland. There may be an abscess present. This is the most common presentation of melioidosis in children.
TREATMENT:	*See Melioidosis, p.162*

18.1 MENTAL HEALTH

Many psychiatric diseases do not have clear signs and symptoms. Alcohol abuse, for example, may be a symptom of depression, anxiety or trauma (post traumatic stress disorder / PTSD).

Disorders of mental health (mood, thinking and behaviour) may be due to a psychiatric diagnosis, a personality disorder or caused by physical disorders. Before you diagnose a mental health problem, you should **exclude underlying physical diseases and assess for drug or substance abuse.** For example, hyperthyroidism may present as anxiety, or a hypoglycaemic patient may be agitated. When diagnosing a mental health problem, you should always get a detailed medical history.

Also, sometimes mental illness can cause **physical symptoms**, called 'psychosomatic symptoms'.

- These occur if a person cannot manage increased levels of mental stress
- Physical symptoms can be seen in depression, bipolar, anxiety and PTSD, and psychosis.
- If the patient cannot manage high stress levels, the body will develop a physical symptom such as headache, abdominal pain, numbness, dizziness, fainting, or even paralysis.
- Sometimes physical symptoms are more easily discussed than the stress (e.g. family problem)
- It is not possible to fix the physical symptom. You must treat the stress and mental problem.

Most mental health problems should not be treated with medication alone. **Drugs should be combined with counselling.**

During pregnancy and breastfeeding, mental health medication should be lowered to the lowest effective dose and the benefits and risks of the medications should be discussed with a doctor if possible.

The following are the more common psychiatric disorders.

18.1.1. MOOD DISORDERS*UPDATE

DEFINITION

There are two types of mood disorders:

1. **Depressive disorder**
2. **Bipolar disorder (manic depressive disorder)**

DIAGNOSIS

1. **Depressive disorder**
   - There are no manic episodes
   - Have one or more depressive episode
2. **Bipolar disorder**
   - Have at least one manic episode and one or more depressive episodes

*For depressive episode**: Must have **≥5 of these symptoms** and **at least 1 of the bold symptoms**. Symptoms must be present ≥2 weeks before you can diagnose a depressive episode.	
• **Feeling sad most of the time** • **Low interest or pleasure to do normal activities most of the time** • Cannot sleep (insomnia) • Weight loss or no appetite	• Low energy or fatigue • Feel guilty or not competent • Loss of concentration • Suicidal thoughts or activities

*A depressive episode can also cause low level of psychomotor activity: the patient may look sad, not laugh, not want to talk, or want to be alone.

For manic episode: Must have **≥3 of these symptoms.** Symptoms must be present for ≥1 week before you can diagnose a manic episode.	
• Extreme feelings of competence (feel like they can do anything) • Less need for sleep • Talking very quickly	• Vivid thoughts (clear ideas) • Easily excited • Increased activity (social, sexual) • Seeks out pleasurable/fun activities

Try to find a trigger event e.g. death of family member, rape, accident, or new diagnosis like HIV

TREATMENT

NON-MEDICATION TREATMENT OPTIONS:
Counselling (*see p.184*).
Encourage the patient to keep active, get up at regular times and do plenty of physical exercise.

MEDICATION TREATMENT OPTIONS:

1. Depressive disorder

1st Line: Selective Serotonin Reuptake Inhibitor (SSRI):

- **Fluoxetine** (1 tablet = 20mg) normal dose 40 - 60 mg OD OR
- **Sertraline** (1 tablet = 50 mg), normal dose is 100 - 200 mg OD
    - Start at 1 tablet/day and wait least 1 week before increasing these medicines. This treament must be continued for 6 months.
    - **Side effects**: Weight gain, nausea, sweating, and occasional mild neurological signs such as tingling in the fingers.
    - It can take 6-8 weeks for this drug to take full effect, but the side effects appear in the first week of treatment. This must be explained carefully to the patient.
    - **Note: in the first few weeks of SSRI treatment the patient may feel worse and suicide risk is increased, explain this to the patient and the family,** *see suicide, p.187.*

2nd Line: Tricyclic antidepressant (TCA) (Use if SSRI not available or if not effective after 8 wks)

- **Amitriptyline** normal dose is between 75 - 150 mg OD at night
    - **Side effects**: Sedation, urinary retention, blurred vision, tachycardia, orthostatic hypotension (BP drops when stand up), agitation, confusion, dangerous in deliberate overdose
    - **Avoid** in patients with cardiac disease, history of seizures, hyperthyroidism, narrow-angle glaucoma and urinary retention.
    - **Note: do not give large amounts of TCAs to a patient undergoing unsupervised treatment. Taking an overdose of this medicine can cause death.**

MANAGEMENT OF DEPRESSION

- After starting treatment follow the patient every 1-2 weeks for 1 month, only give enough treatment for 1 week each time.
- Tell the patient that it is **dangerous to stop anti-depressants suddenly** – how to stop: slowly decrease dose of medications over 1-4 weeks.
- If no effect in 6-8 wks, increase the dose or change medicine. (**Slowly decrease dose before changing**). If treatment is not effective, refer to a hospital where mental health care is provided.

Women are at risk for depression in the first few months postpartum. It can be severe, with psychosis, suicide or killing their infant. Think about the mother and baby's safety. Use all counselling, family support and medications necessary.

2. Bipolar disorder

- Bipolar disorder is difficult to control. These patients are at higher risk for suicide. It is best to refer to a psychiatric specialist. Acute mania may require hospitalization.
- If referral not possible, manic episodes can be treated with **carbamazepine** 200 mg BID. Increase as needed, max 1200 mg/day. Continue treatment to prevent future manic episodes.
- For severe episodes with agitation, patients can be treated as acute psychosis (*see p.182*).
- If history of both severe depression and mania, carbamazepine can be given together with an SSRI.
- Check CBC, LFT and renal function every 3-6 mo for carbamazepine side effects.

Note: if available, **lithium** is inexpensive and may be more effective. Start with 300 mg, normal dose 600-900mg, check thyroid and kidney function every 3-6 months. It has a small therapeutic window. Check lithium levels frequently for overdose. Lithium should not be prescribed if the drug supply is not regular. Low adherence or stopping lithium treatment suddenly may increase the risk of relapse.

MANAGEMENT OF BIPOLAR DISORDER*UPDATE

1. If depression in bipolar disease NEVER prescribe antidepressants without also prescribing a mood stabilizer, e.g. carbamazepine. Mono-therapy with antidepressant can cause manic symptoms
2. If manic episode and patient is on antidepressants: STOP antidepressants to prevent more mania
3. Patients with mania are at high risk of developing depression after a manic episode
4. Do not give carbamazepine, valproic acid or lithium in pregnancy, due to the risk of birth defects

18.1.2. ANXIETY DISORDERS

DEFINITION

Anxiety or mental stress often occurs when we are frightened or worried. Anxiety disorders are defined when a sense of fear or worry makes it hard for someone to do normal activities of life (e.g. completing school work or caring for children) or when anxiety is persistent. When feeling anxiety or stress, the heart may beat faster, reactions are quicker and we are more alert. Headaches and sweating are common. This is a normal reaction to stress, but problems occur when stress levels are too high or they cannot be relieved.

- When these symptoms are chronic the patient may have an anxiety disorder. More severe symptoms from unrelieved anxiety can include sleeplessness, heart palpitations, depression, violence, withdrawal and psychosomatic complaints.
- An acute anxiety attack is an acute episode of severe anxiety with severe psychosomatic symptoms: patients may have chest pain, difficulty breathing, palpitations, dizziness and fear that they are going to die.

TREATMENT

Always look for an underlying mental disorder (depression, PTSD or psychosis) and give specific treatment.

ACUTE ANXIETY ATTACK:

- Try to calm down the patient by talking and listening carefully and reassuring.
- Encourage deep breathing and put them in a quiet private place.
- Consider diazepam PO only in severe acute anxiety attacks (*see below*).
- Use counselling techniques (*see p.184*).

NON-MEDICATION TREATMENT OPTIONS:

- Cognitive behavioural therapy. This should be done by trained health workers. This form of therapy is similar to counselling (*see p.184*).

TREATMENT BY MEDICATION:

- For long-term treatment antidepressants (**SSRIs** or **amitriptyline**) can work well.
- Beta blockers e.g. **propranolol** 40mg OD (increase to TID if necessary) can help with anxiety symptoms of racing heart especially if also have high BP or if tremor/palpitations are the main symptoms. Monitor BP and PR.
- For an acute anxiety attack you can use **diazepam** (5-15 mg PO in 2-3 divided doses for a maximum of 1-2 weeks and reduce dose by half in last few days of treatment) to lower the anxiety.

Diazepam medicine is very addictive: only use it if the patient's anxiety cannot be controlled through counselling.

18.1.3. POST TRUMATIC STRESS DISORDER

DEFINITION

Post-traumatic stress disorder (PTSD) is a condition that occurs as a response to severe and prolonged fear.

- Continual high levels of anxiety that cause problems in the patient's life (e.g. not leave house because afraid).
- This disorder is common after violent situations, or escaped from life-threatening situations

CAUSES

1. Life threatening violence, either a single event or over a long period of time.
2. Violence experienced either directly or happened to somone else but seen by the patient
3. Escaping from possible violence, or afraid of capture.

SIGNS AND SYMPTOMS

- **Persistent re-experience**: cannot stop thinking about the trauma even if you do not want to think about it. Symptoms include distressing dreams and flashbacks (reliving the experience).
- **Avoidance**: patient avoids places, situations, or people associated with the trauma. Patients may use alcohol or drugs to help avoid thinking about the trauma.
- **Increased arousal**: constant alertness, exaggerated startle response (very easily scared), anxiety, insomnia, poor concentration, or physical symptoms (high BP, sweating, shaking, tachycardia, headache etc.)

TREATMENT

NON-MEDICATION TREATMENT OPTIONS

- **Counselling** (*see p.184*).
- **Relaxation** therapy.
- 'Survivors of violence' need to feel **safe and secure** in their environment.
- **Empathy**: **listen and accept** what the person is saying. Ask how they feel about the incident, express your support.
- Talk and **listen**, ask the patient about the history of their problems. For example, when was the first time they felt the headaches, or could not sleep? What things were happening in their lives around that time? Try to locate a probable cause for their symptoms.
- Try to **listen** to the patient's problems. Do not to judge them based upon their stories, express that you are interested in what they have to say and try to let them express themselves. Above all, let the patient know they are not alone and that you understand the reasons for their stress.
- **Group counselling** may be helpful – if the patient interacts with others who have had similar experiences, they may feel less alone.

TREATMENT OPTIONS BY MEDICATION

- Consider antidepressants: **SSRIs** or **amitriptyline** are usually helpful.
- When the patient is suffering from nightmares, a low dose of **haloperidol** (0.5-2mg BID or TID or at night) could be very helpful. Because of possible side effects, use the lowest effective dose and stop if no improvement.
- For other sleeping disturbances, you can use benzodiazepines (e.g. **diazepam** PO 5 mg). Diazepam is an extremely addictive medicine, so diazepam should not be prescribed for more than 1-2 weeks. **Note**: Long-term treatment with diazepam after a traumatic event can have a negative effect on adaptation, leading to higher rates of PTSD.

18.1.4. PSYCHOSIS*UPDATE

DEFINITION

A severe form of mental illness: the patient is unable to distinguish between the real world and the world of their hallucinations and delusions.

Hallucinations: The experience of hearing, seeing, smelling and even feeling things that are not there

e.g. the patient may hear voices talking to them though there is no-one around them, or see things that are not there. It is important to realise that the patient does not imagine these sensations; these are real experiences for them and can be very frightening.

Delusions: Fixed false beliefs that are not shared by other members of the person's culture or society.

Ideas that seem strange and bizarre, such as having powers that others do not possess e.g. the patient may say they can read peoples' minds, or say they are from another planet. Delusions are generally so strange that many peoples' first reaction is to laugh. But in delusions the ideas are fixed, this means that to the patient these beliefs are completely true.

- Due to the extreme nature of hallucinations and delusions, patients are often unable to care for themselves and are likely to be disruptive in the community. Unfortunately, very often people with psychosis may be regarded as "fools" and not considered worthy of medical help. However, with proper medical intervention, psychotic patients can get better.
- Acutely psychotic patients are difficult to talk to, as they are not able to understand what is happening around them. However, medical staff should make attempts to let the patient know where they are and what is happening to them such as telling them that they are in the clinic and that they will receive treatment.

DIAGNOSIS

- Get a history from a family member, is this the first time this has happened?
- Check if there is medical problem causing the confusion (e.g. infections in elderly - urosepsis, steroid induced psychosis, substance abuse, hypoglycaemia)

TREATMENT*UPDATE

NON-MEDICATION TREATMENT OPTIONS

Counselling

- Explain to the patient and family that the symptoms are caused by a mental health condition, that it can be treated and the patient can recover.
- Do not blame the patient or their family or accuse them of being the cause of the symptoms.
- Explain that the symptoms may return or worsen even when on treatment. This is common and they should visit a health care provider as soon as possible.
- Avoid alcohol, betel nut, cannabis or other non-prescribed drugs as they can worsen the psychosis.

MEDICATION TREATMENT OPTIONS

1st line:

- Start **risperidone** 1mg PO daily. Increase 2-6mg daily until improvement. Maximum dose is 8-10mg/day. This is a newer antipsychotic drug and has less side effects (*see below*).

2nd line:

- Give **haloperidol** 2.5-5mg PO or IM if patient is agitated or violent. (max 20mg/d).
- Decrease the dose by half in elderly patients. **Take care for your safety if the patient is violent.**

Additional medication:

- **Diazepam** 5-15mg per day in 2-3 divided doses for severe anxiety or agitation. Use only for a few days because it can be addictive. Do not use as chronic treatment.

Monitor these patients closely as these medicines have severe side effects.

Try to give the lowest dose of haloperidol that is effective. The choice of long term treatment is case by case and should be prescribed by experienced medical personnel. Treatment should include counselling, psychotherapy and social support.

SIDE EFFECTS

Haloperidol

- Parkinsonism: Tremors, stiffness, akinesia (inability to start movements) or bradykinesia (slow movements), postural instability (feel unsteady).
    - **Diazepam** can treat acute parkinsonism side effects
    - When a patient has symptoms of parkinsonism, the dose of haloperidol treatment is too high: lower the dose.
- Oculogyric crisis: Eye rolling movements that are involuntarily, occurs especially in young men.
- Torticollis: Neck twisting movements, occurs especially in young men.

If patient develops muscle rigidity and high fevers not from an infectious cause, may be drug side effect: STOP haloperidol immediately.

Risperidone

- Sedation, dizziness, tachycardia, metabolic (weight gain, elevated lipids, insulin resistance)
- Sexual dysfunction
- Neuroleptic malignant syndrome (NMS)
- Caution in patients with cardiac disease

Drug interactions: carbamazepine can decrease levels of risperidone and fluoxetine can increase levels.

MANAGEMENT

Follow up (*see Counselling, below*)

- Close follow up until symptoms start to respond to treatment.
- Supervise treatment for 4-6 weeks. Can discuss with family member to do DOT.
- If improving continue treatment plan. Can decrease follow up frequency.
- Continue to monitor: check adherence, side effects and dose. Check weight, BP and glucose.

Discontinue medication:

- **If first episode, relapse or worsening of psychotic symptoms**: Consider stopping medication **12 months after symptoms have resolved**.
- Person with symptoms persisting >3 months: Consider discontinuation of medications if person is in FULL REMISSION of symptoms for several years.
- Gradually and slowly discontinue medication dose. Patient and family must watch for early symptoms of relapse.

18.1.5. INSOMNIA

Many patients with mental illness have sleep problems.

TREATMENT

First counsel the patient:

- Keep regular sleep/wake schedule e.g. do not sleep in the afternoon
- Get physical exercise every day (but not right before bedtime)
- Sleep in a dark room
- Avoid coffee, tea, cigarettes and betel in the afternoon and evenings
- Avoid alcohol
- Avoid electronic screens (mobile, TV, computer. etc.) at least one hour before going to sleep.

Are there symptoms of a mental health or physical condition? Treat the underlying diagnosis.

- Is there difficulty falling asleep because they are worrying about something? (**Anxiety disorder**)
- Do they wake up earlier than they want to without any reason? (**Depression**)
- Do they struggle with nightmares? (**PTSD**)
- Is their sleep interrupted by untreated pain? (**Pain**)

If no improvement consider:

- **Amitriptyline**: usually at lower doses than for depression (25-50mg daily) . **Note**: do not use high doses if patient is on an SSRI.
- If severe sleep disturbances **diazepam** 5mg PO may be given for a short period of time. **Be careful: diazepam is very addictive.**
- **Note**: Severe insomnia, no sleep for multiple nights is a risk factor for suicide (*see p.187*).

18.1.6. COUNSELLING

DEFINITION

Counselling is a method used to help treat people with emotional trauma. Counselling is like a 'talking cure'. It can help people by talking and discussing their problems with them. The counsellor can help to find solutions to problems and find ways to manage emotional trauma. Counselling may take time to be effective and needs experienced counsellors to be fully effective.

Some of the rules:

Confidentiality: Everything in the counselling session should not be told to others without the person's permission. If the person tells you that they plan to hurt himself or others you are allowed to break this rule, so you can protect the patient and others. If there is confidentiality then trust can develop.

Trust: Effective counselling can only happen if there is trust between the counsellor and the patient.

Empathy: The counsellor must try to understand the patient situation. Empathy means to see the view from the other person (imagine being the other person and how it feels to have their problems).

Non-judgemental: When a patient shares their problems and life story, you are in a powerful position. The person trusts you and wants you to accept them. People who need counselling are often in a fragile emotional state. They need acceptance and support. Do not judge their behaviour (even if you disagree). This is an important part of counselling.

Listening: Be a good listener. Let the person stop talking and do not push them to speak. Maybe they are not comfortable telling you things. Wait until they are comfortable to talk.

Body Language: How we sit and move show what we are feeling. During counselling, your body language should show the patient that you are interested and listening to them. One way to have good body language is to **remember the letters SOLAR**:

Square:	Sit facing the person, do not sit sideways to them, and look directly at them.
Open:	Sit with an open posture, do not cross your arms or lower your head.
Lean forward:	When you lean slightly forward towards the patient you show them you are interested.
Attentive:	Be attentive to what they are saying, listen and nod your head to show you understand.
Relaxed:	Try not to feel tense or excited. During counselling stay relaxed, the person will feel this and will become more relaxed themselves.

THE COUNSELLING SESSION:
Here are some guidelines on how a counselling session can be run:

1. To start
Explain that you want to help them, introduce yourself and your profession (e.g. medic, social worker). Find a **quiet, comfortable and private environment** to talk. Explain that you would like to get to know them better so that you can effectively deal with their specific problem/circumstance. Ask if they have any questions and answer them. Be honest.

2. Family history
Life story e.g. Why did you come to Thailand? How did you come to the camp? What happened to you while in Burma? Get their medical history and cultural background.

3. Discover what the problem is
Ask the person what problems they are having. Give time for the person to talk, let them stop talking, wait and be patient. Here are some questions you could ask:

- How does it feel when you talk about what happened?
- Does it affect your sleep: do you have nightmares about what happened?
- What effect does the problem have on your life?
- Does it affect your health?
- Do you suffer headaches, or other body pains? If so did they begin after the incident?
- How long have you had the problem?
- How do you think the problem can be solved?
- Discuss possible solutions with them. But do not feel that you must solve their problem.

4. During your discussion, assess the person's mental state

- Are they angry, sad or do they feel nothing? Are they depressed or angry?
- Do they make sense?
- Are they psychotic?

- Do their emotions make sense? For example when telling a bad or sad story are they smiling/ looking happy or when talking of a happy event are they sad/crying?
- Find out if they feel good or bad about themselves, do they have high or low self-esteem (confidence), do they feel powerless, e.g. everything they try or do fails (signs of depression).
- Do they have a history of violence?
- Do they feel violent or suicidal?

One counselling session is not enough to help the patient. After many interviews the patient may be more relaxed and starts to trust you more. The first session is to start the relationship. Successful counselling can take months. These questions can guide the counsellor, to discover the real answers from the person's reactions and attitude.

5. **Positive reflection or observation** (This is most effective with non-psychotic patients)
   - As you listen carefully to the patient, **identify strengths** that they already have that can help them. Remind patients of their strengths: e.g. "You have survived difficult things. You must be very strong." Or "It seems that you enjoy talking with your cousin, and she is a support for you" or "Listening to music seems to make you calm."
   - Notice **what the patient does that contributes to their mental illness**. Observe or explain back to the patient without judging: e.g. "It seems that you are saying when you are alone you think a lot about your baby who died, and that makes you feel more sad" or "It seems that you have these severe anxiety attacks before exams."
   - Think of **simple changes** the patient can do to help their mood: e.g. "When your husband leaves the house, instead of staying there alone, what about visiting your cousin?" or "Do you think you could try to listen to some music while you study to help you feel calm?"
   - Sometimes patients have **untrue beliefs** that contribute to their anxiety or depression. Try to help the patient realize they are untrue: e.g. Counsellor: "You say you cannot pass your classes. Have you passed classes before?" Patient: "Yes, I usually pass my classes, but I failed one class last year." Counsellor, "Good. So you passed most classes, and you have only failed once. Then you must be a good student." **Do not blame the patient for untrue beliefs about themselves.**

Always involve the patient in the discussion. As you are reflecting back to them, ask for their feedback. Do they agree with your suggestions? If no, why not? Do they have ideas about what could improve their mood? At the end of the visit, give the patient one or two simple "homeworks" until you see them next (e.g. "Try talking with your cousin this week at least twice.") Review how those things worked for the patient the next time you see them.

Examples of **homework for patients.** Choose what the patient identifies as helpful to themselves:

- Exercise: especially walking
- Talking with good supportive people
- Religious activity: visiting the mosque, temple or church, or private time to pray or meditate
- Keep a regular sleep schedule
- Eat regularly
- Ask for help from a friend or relative (e.g. to watch children so patient can rest)

DO NOT TRY TO DO TOO MUCH DURING THE FIRST SESSION

6. **Referral**

The counsellor may need to decide whether or not the person needs a referral to another service. The person may need medical help, or protection to escape from an abusive relationship. Any referral should attempt to be undertaken with the person's understanding and permission.

Important points to remember

- Understand that the person takes a risk sharing their story; it is very personal information, which you must respect.
- The person takes an emotional risk to confront painful memories and change themselves; the counsellor can give strength and security.
- The counsellor must be aware of the effect of hearing sad and disturbing stories. You should be prepared to cope with your own emotions and stress.

- The counsellor must be aware that they take a lot of responsibility. This gives the counsellor power over the patient's life. Do not use this power in a negative way. If unaware of this relationship, the counsellor can unconsciously become a part of the problem.

Finally
We counsel to help the person find solutions to their problems, to strengthen the person and to lead them to an independent and happier/healthier life. Counseling cannot always be successful. Letting the patient share their problems in a safe respectful environment will give the patient more confidence and security.

18.1.7. SUICIDALITY/HOMICIDALITY

DEFINITION
Like severe malaria or tuberculosis, mental illness can be a fatal disease if not adequately treated.
Suicide = the patient killing themselves
Homicide = the patient killing someone else

RISK FACTORS
Risk factors for suicide:
- Thinking about suicide
- Bipolar disorder, PTSD, psychosis or recurrent, chronic depression
- History of trying to commit suicide in the past
- Family history of suicide
- Substance abuse (drugs or alcohol)
- Hopelessness (may have loss of relationships or severe debt)
- Isolation: not connected to friends or family
- Severe insomnia
- Other suicides in the patient's community

Risk factors for homicide:
- Substance abuse (drugs or alcohol)
- More common for men
- Have a gun
- Domestic violence

PREVENTION
Gently ask any patient if they have thoughts about hurting themselves, thoughts about hurting someone else, or thoughts that it would be better if they were dead.

****Asking about suicide does not increase the risk of suicide****

- If they do have these thoughts, ask if they have made plans to end their life or to kill someone else (e.g. "if it gets any worse I would drink poison").
- Do they have access to ways that they can easily kill themselves or someone else? e.g. guns in the home, pesticides from farming, a large number of amitriptyline pills.
- What prevents them from committing suicide or homicide? Often they will say "Faith" or "I don't want to leave my children without a father". These are usually strong reasons. If they say, "I really have no reason to live", they are at high risk of suicide.
- If you are NOT reassured by the answers to these questions, or if they have risk factors, discuss with a colleague or supervisor immediately. Make a **safety plan** with family or friends.
- Many communities have used "suicide watch" techniques where friends and family take turns watching the person who is at risk to commit suicide. This can be useful until medication and counselling improves the symptoms.
- If you have concerns the patient might hurt someone else, discuss with a colleague or supervisor immediately. Try to contact the person at risk or the local authorities (e.g. village head).

18.2 SUBSTANCE ABUSE (ADDICTION)

Addiction can cause abuse of substances like alcohol, opiates and amphetamines. This can lead to both short and long term dangers (intoxication, addiction and withdrawal). Other substances like betel and tobacco can increase cancer risk and cause other medical problems. It is difficult to stop addiction. If there is a drug treatment program in your area, suggest that patients get help there. Use counselling techniques (*see p.184*) and ask the family and community to help.

Addiction is a disease: treat patients with empathy and respect, even when it is difficult. Addiction can occur with many things such as gambling, eating sugary food or drink, smoking, or using a smartphone.

18.2.1. ALCOHOL AND DRUG INTOXICATION

DEFINITION

Acute intoxication

If the patient takes too much substance (e.g. alcohol or drug) the body cannot remove it quickly enough. Symptoms may continue until the drug disappears from the body. Intoxication can lead to dangerous behaviour (e.g. driving after drinking, fighting after using amphetamines) or overdose.

REMEMBER: in an overdose with alcohol, opiates (e.g. heroin) or diazepam - if the patient stops breathing but has a stable BP and HR, they may survive if resuscitated with a bag valve mask. You may need to use the bag valve mask for many hours. Ask family members to help if not enough staff.

Addiction:

Long term use can lead to addiction. The diagnosis is addiction if the person has ≥3 signs:

- A strong desire to take the substance.
- Difficulty controlling taking the substance (e.g. when they use, stop and the amount they take).
- Withdrawal signs and symptoms occur when the person does not take the substance regularly (withdrawal stops when the person takes the substance again).
- They need to take more of the substance each time to get the same effect (tolerance).
- The substance will be the most important thing in the person's life.
- The person continues to take the substance even though he/she knows the bad consequences of taking it (e.g. patient may lose a job, need to steal money or have an accident because of drinking too much, but they still cannot stop).

Addicted individuals eventually need the substance in order to function normally.

Withdrawal reaction:

When addicted patients stop taking their substance, they develop withdrawal. Signs and symptoms are usually the opposite of the effects of the drug. Withdrawal symptoms can persist for several days

If a chronic substance abuser wants to stop their addiction, prepare for the acute withdrawal reaction. Long-term follow up is needed with counsellors, the patient and the relatives, to prevent using the drug again.

18.2.2. ALCOHOL

ACUTE INTOXICATION

DEFINITION

Alcohol intoxication is when alcohol intake is more than the body can tolerate. This causes behavioural or physical abnormalities. The person cannot function normally and should not drive a car or motorbike.

SIGNS AND SYMPTOMS

- Smell of alcohol
- Vomiting
- Change in behaviour
- Agitation
- Euphoria
- Loss of control
- Poor coordination
- Drowsy or comatose –as alcohol intake increases

TREATMENT

If in coma *see Emergency treatment of coma p.19.*

1. Check glucose and treat according to the result. If you give prolonged hypoglycaemia treatment without vitamin B1, you might cause the patient to develop Wernicke's encephalopathy. Do not delay treatment for hypoglycaemia, but you should **give vitamin B1 as soon as possible** (before dextrose infusion is best).
2. Rehydrate with IV **NSS** when unconscious.
3. **If history of chronic alcoholism, give vitamin B1 250mg IM or in NSS bag** (this helps to prevent serious permanent brain damage (*Wernicke's Encephalopathy see next page*).
4. Watch for signs of hypoglycaemia (*see p.26*).
5. Check urine output and vital signs every hour until the patient is awake.
6. Position the patient in lateral coma position, because of the risk of aspiration (*see coma p.19 and aspiration pneumonia p.243*).
7. When the patient can swallow advise plenty of fluids (>3L) in order to expel the alcohol from the body.

In case of agitation or violence:

- **Diazepam** 10 mg IV, repeat if needed after 30 minutes.
- Rehydrate (oral or IV). Check for hypoglycaemia and treat if present.

In acute alcohol intoxication there is a high risk of hypoglycaemia.
Chronic alcohol intake is associated with vitamin B1 deficiency.

WITHDRAWAL REACTION

DEFINITION

When the patient stops alcohol quickly (drinking daily then suddenly stop), they will develop withdrawal symptoms. Alcohol withdrawal can cause death. Severe complications occur ~72 hours after presentation.

SIGNS AND SYMPTOMS

- Slight fever (this is a sign of severity)
- Seizures (this is a sign of severity: most common around 6-18hrs after last drink)
- Tachycardia
- Sweating
- Nausea, vomiting
- Neurological signs such as anxiety, tremor
- Auditory and visual hallucinations (see and hear things that are not there)
- Confusion, hyperactivity, anxiety attacks, and poor sleep

Figure 18.2 Short Alcohol Withdrawal Score (SAWS)

Check symptoms and keep a record of the score every day

Symptom	None = 0	Mild = 1	Moderate = 2	Severe = 3	Examine patient and ask questions to get a score.
Anxious					**If <12:** the symptoms are mild/well controlled. Consider **decreasing diazepam** if patient is well.
Feeling confused					
Restless					
Miserable					
Memory problems					**If ≥ 12:** the symptoms are moderate to severe. Patient may be at risk for seizures. Consider **increasing diazepam.**
Tremor (shakes)					
Nausea					
Heart pounding					
Sleep disturbance					
Sweating					

TREATMENT

- If patient is agitated or will not take medicine, **diazepam** 10 mg IV, can be repeated several times until the patient is calm but still awake.
- If patient can take oral medicine, give **diazepam** 10-20mg PO QID for the first 1-2 days. Then give reduced dose e.g. 10mg BID for 2 days, 5mg TID 2 days, 5mg BID 2 days, 5mg OD 2 days, then stop.
- If patients have a history of drinking very large amounts of alcohol, you may need to give higher doses and continue for a longer time. Discuss with the doctor. Evaluate for signs and symptoms of withdrawal and adjust dose based on patients score.
- Try not to hold or tie the patient down physically, they may become more violent: use medicine and help from family members to keep patient controlled.
- Vitamins: give **vitamin B1** (thiamine) 250mg IM or in NSS bag. Follow this with oral: vitamin B1 100mg OD, vitamin B12 PO 1mg OD, folic acid 5mg OD.

Be careful: if you give too much diazepam, the patient can stop breathing.
Keep this patient in close observation!

Wernicke's Encephalopathy or Korsakoff's syndrome
Chronic alcohol abuse combined with a poor diet can lead to Wernicke's Encephalopathy or Korsakoff's syndrome or both due to low vitamin B1 levels. If the patient has any neurological signs e.g. abnormal eye movements, memory problems, confusion, unsteady walk (when not acutely intoxicated) consider these conditions.

18.2.3. OPIOID/HEROIN/MORPHINE

These drugs can be smoked, inhaled via the nose or injected IV.

ACUTE INTOXICATION

SIGNS AND SYMPTOMS

- Euphoria (patient feels calm/always laughing)
- Flushed skin (feeling of being hot on the face, red skin)
- Itchy skin (especially with morphine)
- Myosis (small pupils)
- Drowsiness
- Deep and slow breathing
- Hypothermia
- Bradycardia, hypotension
- Constipation

TREATMENT
The antidote for opiate intoxication is not available at SMRU. Treatment is symptomatic and prevention of complications.

WITHDRAWAL REACTION

Patients will feel terrible but narcotic withdrawal is less dangerous than alcohol withdrawal. However, watch out for signs they might be suicidal (*see p.187*).

SIGNS AND SYMPTOMS

- Anxiety
- Increased respiratory rate
- Increasing body secretions: sweating, running nose, tears
- Mydriasis (dilated pupils)
- Pilo-erection (skin hairs becoming straight) ('gooseflesh')
- Tremor
- Muscle contractions, muscle pain
- Hot and cold flushes
- Abdominal pain, diarrhoea
- Anorexia

TREATMENT
Treatment for symptoms:

- Nausea: **metoclopramide** or **domperidone**
- Abdominal pain: **buscopan**
- Muscle pain: **paracetamol** or **ibuprofen**
- Diarrhoea: **loperamide**.

For severe agitation or anxiety can give **diazepam** 5-10 mg IV, IM or PO.
Methadone and clonidine are used elsewhere but are not available in our setting.

18.2.4. AMPHETAMINES

There are many kinds of amphetamine and they can be mixed together in the same tablet. The tablet may also contain other substances. Amphetamines can be inhaled via the nose, smoked, swallowed or injected IV. Even if used only once, amphetamines can cause acute psychiatric problems.

SIGNS AND SYMPTOMS

Acute Intoxication:
- Increased energy, increased interest in sex
- Insomnia (sleeplessness)
- Anxiety
- Auditory and visual hallucinations

Withdrawal:
- Severe depression (including risk of suicide)
- Very tired
- Increased appetite
- Feelings of paranoia or persecution (e.g. think someone is trying to kill them)

Some types of amphetamine can produce more severe signs and symptoms:
- Severe hyperthermia (very high temperature)
- Disseminated intravascular coagulation (bleeding disorders)
- Rhabdomyolysis (muscle damage)
- Seizures
- Acute renal failure
- Liver toxicity
- Heart problems

TREATMENT

Treatment of symptoms:
- Agitation: **diazepam**
- Psychotic: treat **as for psychosis** (*see p.182*).
- Can try SSRIs - fluoxetine 40 mg or sertraline 100mg (start ½ dose, increase to full dose after 1 wk)

18.2.5. BETEL NUT

DEFINITION

Betel nut is the seed of the betel palm (Areca catechu). Betel nuts are often chewed. People use betel nut to stay alert and decrease stress. It can be mildly intoxicating and decrease appetite. This means that betel nut is a drug. Betel nut is not good for the health if used regularly, I can cause stomach cancers, and problems in the mouth and gums. Many in this area chew betel nut, so it is important to give information on the risks.

SIGNS AND SYMPTOMS

Psychoactive effects
- Sense of well being associated with euphoria
- Warm sensation in the body
- Increased capacity to work
- Insomnia (sleeplessness)

General effects
- Increased sweating
- Increased production of saliva
- Palpitations: related to tachycardia (increase HR)
- Worsening asthma
- Regular betel chewing causes the teeth and gums to be stained red
- Increased convulsions for epileptic patients

COMPLICATIONS

Oral Cancer

In places where betel nut use is high, there are higher levels of oral cancer. The mouth mucosa loses its red colour and is replaced by a white coat (leucoplakia). The carcinoma then spreads easily through the mouth. The diagnosis is not easy to make in the early stages. Oral carcinoma is difficult to cure (and expensive). Treatment for oral cancer is not available in most clinics in this region.

Vitamin B1 Deficiency

Betel nut chewing can cause vitamin B1 deficiency. Patients that complain of beri-beri symptoms (e.g. peripheral numbness or tingling) should be counselled to stop betel nut consumption.

18.2.6. TOBACCO

DEFINITION

Tobacco is a plant that has leaves that can be dried and chewed or smoked. The leaves contain the addictive drug **nicotine**, which makes it very difficult to stop smoking or chewing tobacco if a patient has started to do it regularly. It has similar mild psychoactive effects to betel nut but is considerably more dangerous. All patients who smoke or chew tobacco should be counselled about the complications and urged to stop. Most smokers will experience withdrawal symptoms when they quit smoking, e.g. irritability, difficulty concentrating, restlessness, depression, nicotine craving, insomnia and anxiety.

Passive smoking is inhaling the smoke from someone else smoking e.g. if smoking inside a house then other family members will breath in the smoke. This can be dangerous to their health, especially children (increased risk for wheezing, asthma, respiratory infection).

COMPLICATIONS

1. **Cancer**: oral for chewed tobacco, and lung cancer for smoked tobacco. These diseases can kill the patient and treatment is very difficult, often not successful and generally not available in our area.
2. **Tooth loss**
3. **Breathing problems**: COPD, pneumonia, worsening asthma. If parents smoke their children are at risk for more respiratory infections, and worse asthma symptoms.
4. **Reproductive problems**: miscarriage, infertility, men can become impotent.
5. **Heart problems**: Increased risk of heart attack.
6. **Brain**: Increased risk of stroke.
7. **If pregnant**: pre-term delivery, stillbirth, low birth weight, sudden infant death syndrome, mental retardation, and cleft lip.

TREATMENT

How to stop:
Stopping smoking reduces the risk of above complications.

- It is very difficult to stop smoking, but you can encourage patients to try these things:
- If they often smoke in groups, try to stop smoking as a group. Encourage their friends to stop smoking.
- Think about the bad health effects when they want to smoke.
- Throw away all their cigarettes and tobacco. Try not to go to the places where they usually smoke.
- Replace smoking with healthier activities: go for a walk to relieve stress, drink a glass of water or tea, eat fruit, chew some gum.

If cannot stop then try to smoke outside the house and away from children to avoid passive smoking.

Nicotine replacement therapy: Should be combined with behaviour changes. It will not prevent all withdrawal symptoms but can decrease the intensity of symptoms. Nicotine therapy is safe and not likely to cause any nicotine addiction. Nicotine replacement therapy is not available in most clinics but it might be available in pharmacies.

Can give in different ways, the most common being:

- **Nicotine gum**: Chew slowly for the nicotine to be absorbed through the mucosa. Use for 3-6 mo. Avoid drinking soda, coffee or orange juice when chewing as they make your saliva acidic, which reduces nicotine absorption.
    - <25 cigarettes per day: 2mg up to 24 gums each day.
    - >25 cigarettes per day: 4mg up to 24 gums each day.
- **Nicotine skin patches**: deliver nicotine to the blood through a skin patch. There are different brands so check the instructions for the specific brand you're using.

19.1 DIORDERS OF THE JOINTS

Joint problems can be caused by infection, non-infectious causes, or trauma. In young children, the only sign of a problem may be refusing to walk, so think of joint problems in these patients. Joint trauma is not discussed in these guidelines.

Infectious arthritis
- Septic arthritis
- Reactive arthritis
- Gout

Non-infectious arthritis
- Osteoarthritis
- Rheumatoid arthritis

It can be very difficult to decide if the joint is infected or inflamed. It is very important to get a clear history. If not sure, treat for both infection and inflammation.

19.1.1. SEPTIC ARTHRITIS

DEFINITION

Acute bacterial infection of the joints. Usually affects one joint but sometimes more than one joint (**not symmetrical**). It is most often spread from the blood into the joint. The most common bacteria causing septic arthritis is *Staphylococcus Aureus*. *Gonococcus* can also cause infection in sexually active young adults and *Haemophilus influenza* infection can occur in unvaccinated children. Patients with other joint problems (e.g. rheumatoid arthritis) have a higher risk for septic arthritis.

SIGNS AND SYMPTOMS

Newborn or infant:
- Will not move limb with the infected joint (pseudo paralysis)
- Cries when the infected joint is moved
- Irritability
- Fever

Child or adult:
- Does not want to move limb of the infected joint (pseudo paralysis)
- Intense joint pain
- Joint swelling and redness
- Limping/ not walking (lower limbs)
- Fever

Consider **gonococcal arthritis** if have the following symptoms:
- Migrating joint pain
- Fever
- Skin rash (papular, pustular or vesicular with red base)
- Pain in the back of hands/wrists and ankles (due to tendon inflammation).
- Especially if have symptoms of STI e.g. urethral or vaginal discharge, lower abdominal pain

DIAGNOSIS
- Clinical
- CBC, CRP – WBC and CRP usually raised in septic arthritis
- Aspiration of fluid from the joint (where possible) - pus culture, gram stain, cell count (WBC)
- Blood culture

TREATMENT

In infants <3 mo, give IV cloxacillin and IV gentamicin, discuss with doctor.

Children ≥3 months to < 5 years:
- Admit to IPD
- Give IV **cloxacillin**. After improvement, can change to oral cloxacillin for a minimum of 2 weeks total IV+oral. Treatment duration depends on the bacterial cause.
- If no fluid culture result is available and no improvement at day 3, ADD IV **ceftriaxone**.

Children > 5 years/Adults:
- Admit to IPD
- Give IV cloxacillin for 2 weeks, followed by oral cloxacillin for a minimum of 2 weeks.
- If no fluid culture result is available and no improvement at day 3 , ADD IV **gentamicin** for 5 days +/- **ceftriaxone**.

For all patients:
- Drain infected joint fluid with needle as soon as possible (may need multiple drainage)
- If blood or aspiration cultures grow any organisms, then change to a narrow spectrum antibiotic
- Try to splint and rest the joint until signs of inflammation improve especially if it is a weight bearing joint like the hip or knee.

If there are signs of gonococcal arthritis:
- IV **ceftriaxone** until 2 days after joint improvement begins.
- Then change to oral **ciprofloxacin** for 2 weeks.
- Add **azithromycin** 1g STAT dose OR **doxycycline** 100mg BID for 7 days (to treat chlamydia)

To prevent muscle wasting and joint stiffness, start physiotherapy (moving the limb) early

PREVENTION
Preventive antibiotics may be helpful for high-risk people (e.g. recent land mine injury).

19.1.2. REACTIVE ARTHRITIS

DEFINITION
An autoimmune condition that develops as a response to an infection. It has been associated with gastrointestinal infections (e.g. *Shigella, Campylobacter*) or genitourinary infections (e.g. *Chlamydia*).

SIGNS AND SYMPTOMS
May appear months after the gastrointestinal infection. The arthritis symptoms are often in combination with urethritis and conjunctivitis.

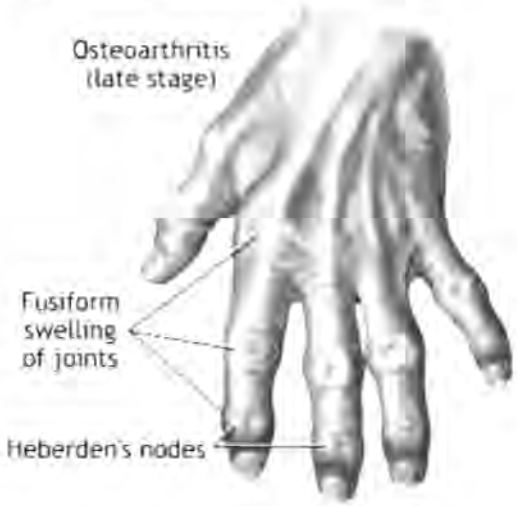
TREATMENT
Supportive treatment. Give NSAIDS or steroids to relieve symptoms. If suspect chlamydia, give appropriate treatment. **Note**: Be careful to not to miss a septic arthritis.

19.1.3. OSTEOARTHRITIS

DEFINITION
Osteoarthritis is chronic inflammation of the joints. The cartilage that protects bony surfaces of joints is damaged from overuse (more common in older people). There is pain when the bones rub together (e.g. walking). The most common joints affected are the hips, knees, spine, feet and hands. Osteoarthritis usually does not respond to steroids. Quick improvement after steroids is more likely rheumatoid arthritis.

SIGNS AND SYMPTOMS
- Chronic joint pain and stiffness
- Joint swelling and deformity
- Crackling noise on joint movement
- Muscle wasting
- **Joint pain worsens during the day**

Figure 19.1 Signs of osteoarthritis



DIAGNOSIS
Osteoarthritis is a clinical diagnosis.
X-ray of the affected joint could confirm the diagnosis.

TREATMENT
Medication treatments:
- Treat pain with **paracetamol** or anti-inflammatory medication e.g. **ibuprofen**, **aspirin**.
- Often pain relief is needed long-term: be careful of drug side-effects, especially in older people.

Non-medication treatments:
- Regular gentle exercise is important to improve stiffness and strengthening muscles and joints (swimming and riding a bicycle can take the weight of joints whilst exercising muscles).
- Weight loss
- Applying local heat before, and cold packs after exercise, can help relieve pain and inflammation, so do relaxation techniques.

19.1.4. RHEUMATOID ARTHRITIS

DEFINITION

In rheumatoid arthritis, the body's immune system attacks the lining of the joint and this causes chronic inflammation of the joints. This often leads to severe destruction and deformity of the affected joints. Frequently more than one joint is affected in a symmetrical fashion (which means that if one knee or wrist is affected, the other knee or wrist will also be affected). Hands, feet, wrists, elbows, knees and ankles are commonly involved, and symptoms usually start after 40 years of age. However, rheumatoid can begin in childhood (juvenile rheumatoid arthritis). Rheumatoid arthritis is a chronic condition that often presents with recurrent attacks.

SIGNS AND SYMPTOMS

- Joint stiffness, **worse in the morning**, which gets better the more they are used throughout the day
- Swollen, warm and tender joints
- Joint deformity (usually obvious in hands)
- Active and passive movements are painful and restricted.

Other features:
Anaemia, skin nodules, pericarditis, lung fibrosis, inflammation of the eye (which can lead quickly to blindness). Still's disease; joint inflammation together with skin changes and spleen enlargement.

Figure 19.2 Signs of rheumatoid arthritis

DIAGNOSIS

The diagnosis of rheumatoid arthritis may be difficult. There are other forms of autoimmune arthritis (e.g. psoriasis arthritis, reactive arthritis). Some laboratory tests (e.g. rheumatoid factor or CCP-antibodies) that can help make the diagnosis, but before you request these investigations, consult the doctor.

- Rheumatoid arthritis is a clinical diagnosis.
- X-ray of the affected joint could confirm the diagnosis.
- CRP or ESR can be used to monitor disease response to treatment.
- Check Hct to rule out associated anaemia.

TREATMENT

Medication treatment:

1. Analgesia (*see p.32*) e.g. **paracetamol**, **tramadol** (if severe pain); Non steroid anti-inflammatory (NSAID) medication such as **ibuprofen**, **diclofenac** or **aspirin**
   - NSAID medication should not be used for long periods of time if possible and it is important to know if the patient has a history, signs or symptoms of gastritis/peptic ulcer.
   - Try to avoid using high doses of anti-inflammatory medication if the patient's pain is better with lower doses.
2. **Methotrexate** OR **chloroquine** OR penicillamine (if available).
   - These are called Disease Modifying Anti-rheumatic drugs (DMARDs) and they suppress joint destruction in rheumatoid arthritis. (Always discuss with a doctor before giving these drugs).
   - Treatment with DMARDs is usually required for a long time (at least 6 months). Doses should be adjusted up or down depending on patient response to treatment.
   - There are newer generations of DMARDs (e.g. TNF-Alpha blockers, calcineurin inhibitors), but these drugs are expensive, need cold chain (keep in fridge), and make patients at higher risk for infections (e.g. TB). If the symptoms cannot be controlled with the usual drugs, consider referral.
3. **Prednisolone** – short course
   - Should be given when initially starting DMARDs.
   - Should be given during flare ups ("attacks") of rheumatoid arthritis.
   - **Note**: Use the lowest dose possible. De-worm before starting, never stop steroids suddenly. It can cause adrenal insufficiency – shock more severe than patient condition, nausea, vomiting, abdominal pain (like acute abdomen), unexplained fever or hypoglycaemia). Counsel the patient the possible side effects of long-term steroid use (e.g. peptic ulcer, osteoporosis, glaucoma, more infections).

The aims of medication treatment are to:
Relieve pain
Slow down or stop joint destruction
If need to give steroid use with an NSAID, add **omeprazole** in order to prevent gastritis/ulcer

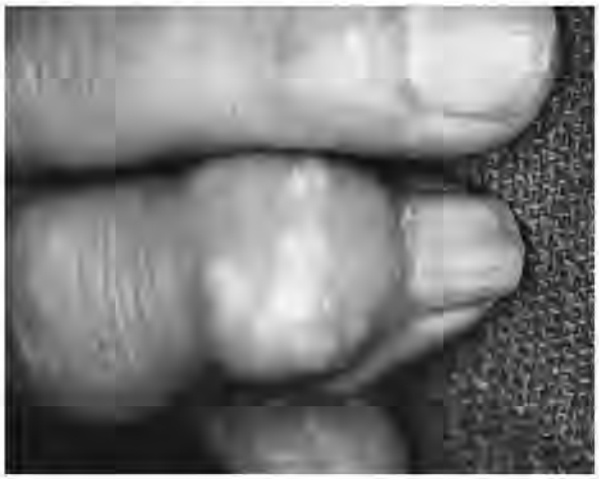
Non medication treatment:
- Regular gentle exercise to reduce stiffness and strengthen muscles.
- Wrist splints may give symptomatic help and may improve the function of the joint.
- Applying heat and cold packs can help reduce pain and inflammation.

19.1.5. GOUT

DEFINITION
Inflammation of the joints from uric acid crystals inside the joint. There may be high levels of urate in the blood which can be caused or made worse by certain risk factors (*see below*). Gout is often misdiagnosed as septic arthritis or cellulitis because attacks occur suddenly. The big toe, knees and other joints in the feet are commonly affected. Some people get only one attack and others might get many attacks in their life. Most people are older than 30 years at the time of their first attack.

RISK FACTORS
These can cause high uric acid levels:
- Alcohol
- Obesity
- Some foods (red meat, especially organ meat, seafood)
- Medications (hydrochlorothiazide, low dose aspirin)
- Genetic predisposition

Figure 19.3 Gout tophi nodule on the finger



SIGNS AND SYMPTOMS
- Severe acute joint pain
- Red, hot and swollen joint (often the big toe)
- Fever
- Nodules on fingers, toes and elbows (called tophi). Tophi happen late in gout, cause pain, press on nerves and damage joints. There might be white deposits inside the nodule caused by urate crystals.

COMPLICATIONS
Deformity of the affected joints, kidney stones (uric acid stones), renal failure.

DIAGNOSIS
Clinical diagnosis. Serum uric acid (if available) may be high but can also be normal.

TREATMENT
Medication treatment
- NSAIDs such as ibuprofen (**Note: DO NOT use aspirin. It can increase the symptoms**).
- If no response, consider treating with **prednisolone.**
- In patients with recurrent attacks, tophi or renal stones: try **allopurinol** initially 100 mg OD. Increase weekly to 200-300mg OD (maximum 600 mg OD). Try to lower uric acid to < 6mg/dl (0.36mmol/L.
- **Note: DO NOT use allopurinol during an acute attack**. Only start 3 weeks after attack. Take NSAIDs during the first 3 months of taking allopurinol. Allopurinol increases risk of acute gout. If on hydrochlorothiazide for high BP change to other medication. HCTZ increases risk of gout.

Non-medication treatment:
- Rest and elevate joint, ice pack may be useful. Drink lots of water

PREVENTION
- Weight loss
- Avoid alcohol
- Eat LESS red meat and seafood in diet
- Eat MORE vegetables

19.2 DISORDERS OF THE BONES

19.2.1. OSTEOMYELITIS

DEFINITION

Osteomyelitis is an infection of the bone. Bacteria spread from the blood stream to the bone.

- Occurs most commonly in children
- Bacteria in the blood stream come from another location
    - Lungs (pneumonia)
    - Skin (cellulitis, ulcers, wounds, post-trauma)
- Most common bacteria in osteomyelitis:
    - *Staphylococcus aureus*
    - *Klebsiella*
    - *Enterobacteria*
- Osteomyelitis can become chronic if the acute infection is not treated well. This causes bone sclerosis and deformity.
- Common sites of infection are the tibia, femur, humerus, and the vertebral bodies. Osteomyelitis involving the vertebral bodies can also be caused by tuberculosis.

SIGNS AND SYMPTOMS

- Pain in the bone
- Local swelling, redness, and warmth
- Fever, chills
- Back pain
- General discomfort, irritability (infants), or ill feeling (malaise)
- Fracture without trauma
- Drainage of pus through the skin (in chronic osteomyelitis)

DIAGNOSIS

- CBC shows elevated WBC. CRP may be elevated.
- Blood cultures when the fever is high may help identify the causative organism. If possible, take blood cultures before starting antibiotic treatment.
- Collect pus for culture from the area around infected bones by needle aspiration.
- X-ray will usually NOT give a diagnosis in the early stage of infection.
    - **In infants**: X-ray will be abnormal at the initial presentation so it CAN be used for diagnosis.
    - **In children**: Long bone changes may be seen after approximately 10 days. For pelvic or vertebral osteomyelitis, the X-ray may be normal.
    - **In adults**: X-ray should be done only if symptoms have been >14 days.

TREATMENT

Osteomyelitis always requires prolonged antibiotic therapy, usually at least 4-6 weeks (minimum 2 weeks IV), and may require surgical debridement. Severe cases may lead to the loss of a limb. Never forget pain treatment.

- **For infants <3 months:**
    - Admit IPD
    - Start IV **cloxacillin** AND IV **ceftriaxone**

- **For Child ≥3 months to Adult:**
    - Admit IPD
    - Start IV **cloxacillin**

- **For all patients**

1. Change to oral treatment if:
    - CRP decreases by approximately 50% every 2-3 days and continues to decrease
    - No fever > 48 hours
    - Clinical condition improved – decreased pain, erythema, swelling
    - WBC improving or normal
    - Age is ≥1 month (if <1 month old, continue IV treatment for 4 weeks)
    - Patient has a normal immune system

If you have a positive culture, you may treat with the appropriate sensitive antibiotic.
(if <3 months old, add oral alternative for ceftriaxone, like **amoxicillin-clavulanate**)

2. If no improvement:
   a. Discuss with the doctor
   b. Repeat X-ray and think of other diagnosis
   c. Consider adding ceftriaxone IV
   d. Consider referral for bone biopsy

3. If associated with wounds, diabetes mellitus or ulcer:
   Start **clindamycin** AND **ciprofloxacin**
   OR
   cloxacillin AND **ciprofloxacin** AND **metronidazole**

Longer oral treatment may be needed – months of treatment
may be required until CRP (or ESR) is normal

- **Surgical Treatment**:
  - Always evaluate if the patient needs surgical debridement in acute osteomyelitis, consider referral for orthopaedic consultation for advice and treatment.
  - **Note**: All cases of chronic osteomyelitis should be referred for surgical debridement if possible.

PREVENTION

- Appropriate diagnosis and treatment of primary bacterial infections will reduce the chance of spread of infection from other sites into bones.
- Direct inoculation osteomyelitis can be best prevented with appropriate wound management and consideration of prophylactic antibiotic use at the time of injury (especially in immuno-compromised patients e.g. diabetes, steroid use).

20.1 HEADACHE

Headache, like anaemia, is a symptom and not a disease. Look for the cause.
Only after a specific cause has been found should treatment be given.

CAUSES

- Tension (stress)
- Depression
- Migraine
- Trauma related
- Temporal arteritis
- Cervical arthritis
- Glaucoma
- Brain tumours
- Stroke
- Subarachnoid haemorrhage
- Infections:
  1. Localised: e.g. meningitis/encephalitis, sinusitis
  2. Systemic:
     - Bacterial e.g. TB, leptospirosis, typhoid
     - Viral e.g. dengue fever
     - Parasitic e.g. malaria
- Drugs: alcohol, nifedipine, caffeine withdrawal.

DIAGNOSIS

The most **important part of the evaluation of headache is the HISTORY**. You should ask:

- How bad is the pain?
- Where is the pain? (ask the person to draw the shape of the headache on his/her own head).
- Is it a new onset or a chronic headache?
- When does it start and how long does it last?
- Anything that makes the headache worse e.g. coughing, poor sleep?
- Are there any associated systemic signs and symptoms?

****DANGER SIGNS****

1. Acute severe headache.
2. New onset and/or never had headache before.
3. Progressive (increasing in intensity and severity).
4. Caused by, or worsens with coughing, sneezing, exercise.
5. New neurological signs and symptoms (e.g. mental disturbance, memory loss , convulsions, abnormal reflexes, loss of sensation, loss of muscle power).

Treat the underlying disease (e.g. infections) and relieve headache with paracetamol. For specific causes of headache *see below.*

EMERGENCY CAUSES OF HEADACHE

20.1.1. MENINGITIS/ENCEPHALITIS

DEFINITION

Acute inflammation of the membranes covering the brain (meninges) or the brain itself (encephalitis), often caused by infection.

SIGNS AND SYMPTOMS

Severe headache developing over a few hours associated with fever and decreased consciousness. Usually there are no neurological signs (although may have in encephalitis) (*see meningitis, p.156 and encephalitis, p.170*). TB meningitis may be much less acute.

TREATMENT

Immediate antibiotic treatment. Viral encephalitis will not respond to IV antibiotics. If possible do an LP before treatment if no contraindications (*see p.156*). Do not delay treatment if waiting to do an LP.

20.1.2. SUBARACHNOID HAEMORRHAGE

DEFINITION
Bleeding on the surface of the brain into the subarachnoid space.

CAUSES
1. Trauma
2. Aneurysm (weakness of the wall of blood vessels)

SIGNS AND SYMPTOMS
- **Sudden onset of extremely severe headache**. Often starts at the back of the head and described as being hit/kicked on the back of the head.
- May have nausea, vomiting, decreased consciousness and occasionally neurological signs.

TREATMENT
Immediate referral to hospital. This patient needs a CT scan of the head +/- lumbar puncture and may need brain surgery.

20.1.3. STROKE

DEFINITION
Death of brain cells because of a problem in the blood supply to a region of the brain. A stroke has specific signs and symptoms but may be accompanied by a headache. (*see p.205*).

TREATMENT
See Stroke, p.205

20.1.4. ACUTE (CLOSED ANGLE) GLAUCOMA

DEFINITION
When the pressure of the eye suddenly increases which can lead to blindness.

SIGNS AND SYMPTOMS
- Rapid onset severe eye pain and around the eye
- Blurred vision
- Nausea
- Vomiting
- Patient looks unwell
- Red eye
- Hazy cornea
- Non-reactive mid-dilated pupil (uni or bilateral)

TREATMENT
Immediate treatment with **acetazolamide** and **pilocarpine** then **IMMEDIATE referral to hospital**, *see p.84*.

NON-EMERGENCY CAUSES OF HEADACHE

20.1.5. TENSION HEADACHE

DEFINITION
Most common form of headache which occurs because of chronic tension of head and shoulder muscles. It is a benign headache, often caused by stress, poor sleep or straining eyes.

SIGNS AND SYMPTOMS
- The headache is usually bilateral (both sides of the head are involved), may be worst around the neck or back of the head and not associated with any neurological signs or symptoms.
- Generally daily and described as 'tight' or 'band like'.
- The pain does not worsen with coughing, sneezing or exercise.

TREATMENT
- Counsel that the headache is caused by tension of head and shoulder muscles from stress
- Try to decrease tension by getting enough sleep, lower stress at work or at home, and do exercise (e.g. swimming, walking, sport). Sometimes massages and/or hot baths will help.
- Use simple analgesics such as **paracetamol.**
- ***Note***: overuse of painkillers e.g. paracetamol can also make the headaches worse.

20.1.6. MIGRAINE

DEFINITION
Chronic episodes of headache that are **moderate to severe**, which may have a **trigger**, and may be associated with **neurological findings**.

SIGNS AND SYMPTOMS
- Usually migraine attack is one-sided (sometimes both sides) beating or dull headache that can be worsened by activity.
- Commonly associated with nausea, vomiting, photophobia, blurry vision and feeling of a blocked nose on the side of the pain.
- Pain builds up gradually over hours and may last for several days.
- Vision changes (light flashes, zigzags, and/or vision field defects) can occur before headache onset
- Other neurological findings such as aphasia (cannot speak), numbness, tingling or weakness.
- Some people experience symptoms (e.g. change in mood, tiredness, yawning, stiff muscles, strange smell) a few hours or days before the migraine.
- Symptoms that occur before the headache are called '**aura**'. Auras can help alert the patient to know that a migraine headache will start.
- There is usually a family history and attacks may have triggers e.g. stress, certain foods, alcohol, menstruation and contraceptives.
- **Note**: symptoms for migraine and stroke can be similar – discuss with a colleague or doctor if not sure. Stroke is an emergency and is managed differently (*see p.28*).

TREATMENT
- Staying in a quiet dark room is often helpful.
- Acute attack: (doses for adults)
    1. **Aspirin** 300-900mg QID (max 4g/day) OR
    2. **Ibuprofen** 400mg TID (max 2.4g/day) OR
    3. **Diclofenac** (50mg at start of headache, repeat in 2 hrs if needed, then in 4-6 hr (max 200mg/d)
- **Note**: do not give aspirin to children
- If the attacks are frequent, try prophylaxis medication: (doses for adults)
    1. **Propranolol**: start at 40mg OD, increase by 40mg every week until good response (maintenance 80-240mg in divided doses). Monitor HR and BP. DO NOT stop treatment suddenly because this can be dangerous.

       OR
    2. **Amitriptyline**: start at 10mg OD at night; increase to maintenance dose 50-75mg OD at night, max 150mg OD at night.

20.1.7. DEPRESSION

Headache is very common in depressed people, if there is no obvious cause for the headache then assess the patient's mental health to rule out depression.

TREATMENT
See treatment advice in mood disorders (*see p.179*).

20.1.8. TRAUMA RELATED

DEFINITION
Headache that occurs after trauma. This is different from sub-arachnoid haemorrhage.

SIGNS AND SYMPTOMS
- Non-specific symptoms including headache may often occur after a head injury, regardless of the severity of the injury.
- Headache usually starts within a day or so after the injury and worsens over the next few weeks and then gradually gets better.
- Usually a dull constant ache with pulsating pain that may be localised.

****DANGER SIGNS OF BLEEDING IN THE BRAIN****
Nausea, vomiting, visual disturbances, impaired memory,
difficulty concentrating and unstable emotions.
If the patient has any of these symptoms, then discuss with team for referral.

TREATMENT
If suspect bleeding in the brain, discuss with the doctor whether need to refer to hospital for more investigation (may need a brain CT/MRI scan).
Exercise of neck muscles, simple analgesics and occasionally **amitriptyline**.

20.1.9. BRAIN TUMOURS

DEFINITION
Mass in the brain that can be benign or cancer

SIGNS AND SYMPTOMS
- Headaches
  - Vary from mild to severe
  - Described as different from any previous headache
  - May be of new onset and worsen over time.
  - If the headache is worsened by exertion and position, and associated with nausea and vomiting, this maybe a sign of increased intracranial pressure due to a mass.
- Neurological signs.
- Other symptoms depending on where in the brain the mass is, e.g. personality change, decreased intelligence, emotional change, seizures.

DIAGNOSIS
The diagnosis must be made with a brain CT/MRI which cannot be done at most clinics.

TREATMENT
Treatment for tumours is mostly not available here. Consider providing symptomatic treatment of the headache or referral if possible. *See palliative care p.224.*

20.1.10. TEMPORAL ARTERITIS

DEFINITION
Inflammation of the blood vessels of the head that can lead to blindness. Very rarely occurs in people less than 50 years.

SIGNS AND SYMPTOMS
- Elderly patients (50 or older) with a one-sided headache (although both sides can also occur)
- May be associated with malaise, fever, muscle pain, anorexia and weight loss.
- Palpation of the head reveals sensitive and thick (temporal) arteries with or without pulsation.

DIAGNOSIS
Clinical history and examination.
In 95% of cases the CRP is raised (above 90).

TREATMENT
Needs early treatment with steroids to prevent blindness, consult with doctor.
Prednisolone:
- Always deworm before starting steroids.
- Start at 1mg/kg OD (max 60mg)
- After 1-2 wks decrease the steroid by 10mg every 1-2 ks depending on the response to treatment.
- Once below 30mg the dose can be dropped by 2.5mg every 2 wks.
- From 10mg OD reduce slowly over months until the lowest effective dose is reached.
- Increase the dose again if the symptoms get worse.
- After 2 years of steroids you can try to stop, but 25% of patients need longer treatment (some patients need life-long treatment).

20.1.11. OTHER CAUSES OF HEADACHE

Other causes of headache are: dental, ocular, sinusitis, cervical arthritis, or cough headache

DEFINITION
Dental problems, sinusitis, or eye problems can cause headaches. Muscle or bone problems in the neck e.g. arthritis of the neck often result in headache. Also sudden increase of abdominal muscle tension (e.g. defecation) can cause headache. This pain lasts only a few seconds/minutes and disappears. The cause for cough headache is not known; it may persist for several years.

TREATMENT
Find and treat the cause. Give painkillers according to cause.

20.2 EPILEPSY

DEFINITION
An epileptic seizure is a sudden onset event where there is a disturbance of consciousness, posture, movement or behaviour due to increased electrical activity in the brain. **It is diagnosed ONLY after a person has had more than two seizures**. There are many different types of seizure.

Status Epilepticus = several separate seizures where the patient does not become completely conscious in between or an uninterrupted seizure lasting more than 10 minutes.

The most common types of epileptic seizures are:

GENERALIZED (TONIC CLONIC) CONVULSIONS

- In this type of seizure there is a sudden loss of consciousness with or without cyanosis and strong jerking movements of the arms and legs (sometimes the patient also passes urine or bites their tongue). When the movements stop, the patient may be very sleepy.
- In small babies, obvious arm or leg movements might be absent but their eyes may blink, and they may smack their lips together or clench their hands.
- **Note:** If the patient is still conscious during the episode, it is not a generalised convulsion but it could be a different type of convulsion

CHILDHOOD ABSENCE ATTACKS

- In this type of seizure the child suddenly stops talking or playing for a few seconds and then starts again to do what he was doing. The child does not remember the attack.

If a patient presents with a history of strange sensations or movements of their limbs, or suddenly going floppy or stiff, epilepsy should be considered. Discuss with a doctor.

DIAGNOSIS
The most important step in diagnosing epilepsy is to take a good history of the episode from someone who has seen the seizure. Not all seizures are due to epilepsy. Think of other diagnoses:

Seizures with fever:	malaria, meningitis, hyperthermia, encephalitis
Seizures with or without fever:	hypoglycaemia, severe dehydration, head trauma, amphetamines, alcohol, renal failure (uraemia), loss of concsiousness from vagal response
Seizures in pregnant women:	eclampsia
Repeated seizures without fever:	brain tumour, cysticercosis

- Every patient presenting with a seizure should have a full neurological examination performed.
- If possible do an ECG. Sometimes cardiac arrhythmias can present as loss of consciousness or absence seizure (sudden collapse).

TREATMENT

- For treatment of acute convulsion *see 'Convulsions' section p.22.*
- Not all medications are available. If possible refer if you cannot treat.

Figure 20.1 Treatment of different kinds of seizure

Seizure type	Medication to treat	Medication to avoid
Infant (<1year) Generalised tonic clonic seizures	1st line: Phenytoin 2nd line: Phenobarbitone	Sodium valproate
Child Generalised tonic clonic seizures	1st line: Sodium valproate 2nd line: Carbamazepine	
Child Absence seizures	Sodium valproate	Carbamazepine Phenytoin Phenobarbitone
Adult Generalised tonic clonic seizures	1st line: Carbamazepine 2nd line: Sodium valproate	

1. Consider starting medication if the patient is having **more than two convulsions in one year.**
2. Counsel that treatment is long-term and stopping suddenly could cause severe convulsions.
3. Talk to the patient about epilepsy and explain that it is a disease that can be controlled.
4. If the patient agrees to treatment, treat with **one medication only.**
5. If the seizures are not controlled on one medication at the maximum dose, discuss with a doctor. It may be dangerous to stop one medication and switch to another one very quickly.
6. Start with a small dose and then increase until convulsions are controlled or there are side-effects.
7. Encourage the patient to come back every month. If possible ask them to write a diary of when they are having seizures and what they were doing at the time.

Many epilepsy medications have drug interactions so always check carefully when prescribing.
****Check baseline CBC and LFT's before starting epilepsy medication****

Figure 20.2 Adverse effects of epilepsy drugs*update

	Starting dose	Increasing dose	Usual dose	Max dose per day	Contraindication	Most common side-effects	Toxic effects
Carbamazepine	100mg BID	Increase by 100-200mg every 2 wks	400-600mg BID	2g	Severe heart disease, bone marrow depression. Be careful if liver or kidney disease	Drowsiness, confusion, rash, dry mouth	Rash, nausea, double vision, dizziness, low sodium, low RBC/ platelet/ WBC. Monitor CBC, LFT after start.
Phenobarbitone	60mg at night		60-180mg at night	180mg	Severe respiratory depression	Drowsiness, confusion, hypotension, rash	Blood disorders, respiratory depression and respiratory arrest, nystagmus, ataxia
Sodium Valproate	200mg TID	Increase by 200mg every 3 days	1-2g per day	2.5g	Active liver disease, pancreatitis	Nausea and vomiting, dyspepsia, weight gain, ankle swelling	Low platelet, sedation, confusion Rarely, liver failure; especially in children <3 years old. Monitor CBC, LFTs after start.
Phenytoin	200mg OD	Increase slowly (ideally measuring blood levels)	200-500mg OD	500mg	Bradycardia	Depression, insomnia, polyneuropathy, acne, swollen gums	Double vision, tremor, ataxia, difficulty speaking, confusion, changes in behaviour, anaemia

Adult drug doses for epilepsy medications:
(For child drug doses *see Pharmacy Handbook or other sources e.g. BNF*)

STOPPING EPILEPSY MEDICATION

The majority of patients will have no more convulsions after a few years on medication.

Consider stopping medication if the patient has had no convulsions for more than 2 years AND has a normal neurological examination

Discuss the possibility with the patient and take the decision together. Some patients will be too afraid of having convulsions if medications are stopped, other patients will wish to stop as soon as possible.

- More than 60% will have no more convulsions if medication is stopped.
- Less than 40% will start having convulsions again after medication is stopped.

If you and the patient decide to stop the medication, you must gradually decrease the medication every 4 weeks. Schedule for adult patients:

- Decrease carbamazepine by 100mg every 4 weeks.
- Decrease phenobarbitone by 30mg every 4 weeks.
- Decrease sodium valproate by 200mg every 4 weeks.

If switching anti-epileptic medication do not stop any of the medications suddenly.

PREVENTION

- Take long-term epilepsy treatment to prevent new seizures.
- Teach families about the coma position and how to prevent aspiration after a seizure. If seizure not stopping by itself after a few minutes must go to the clinic.

20.3 STROKE

DEFINITION

A stroke, also called a cerebro-vascular accident (CVA), is the sudden death of cells in a specific area of the brain. This is caused by a blood supply problem to the brain cells. The brain tissue around that artery is damaged or dies. (Brain cells need oxygen and nutrients from the blood and to remove waste products.) The effects of a stroke depend on how much damage occurs, which part of the brain is affected and if blood supply can be restored safely.

****STROKE IS A LIFE-THREATENING EMERGENCY****

Using **FAST technique** can be very helpful:

F - Facial weakness: Has their face fallen on one side? Can they smile?
A - Arm weakness: Can the person raise both arms and keep them there? Is there weakness on one side?
S - Speech and communication difficulties: Is their speech slurred?
T - Time: Time is important, needs URGENT to transfer to the hospital if you see any single one of these signs.

Note: hypoglycaemia can also cause these symptoms. Treat hypoglycaemia if the dextrose is low. If the patient does not recover when the dextrose is normal, then think of stroke.

CAUSES

1. **Ischemic stroke**: caused when a blood vessel becomes blocked. Responsible for 80% of all strokes. This can happen from hardening of the arteries (arteriosclerosis), fatty plaque build up in the arteries (atherosclerosis) or a clot that travels from another part of the body (embolism).
2. **Haemorrhagic stroke**: caused when an artery in the brain ruptures. Responsible for 20% of all strokes. Hypertension is the most common cause. Other causes: aneurysms (weakness of the wall of blood vessels) and arteriovenous malformation (an abnormal connection between arteries and veins)

3. **Transient ischaemic attack (TIA)**: also called temporary or mini stroke. Symptoms are similar to stroke, but the symptoms resolve completely in 24 hours. The blood supply problem is temporary (in a stroke, the symptoms are more permanent). It is a warning sign of worsening cerebrovascular disease. A complete stroke may follow a TIA after a few hours, or after weeks to months.

A stroke may also be caused by different infections: malaria, tuberculosis, cysticercosis and syphilis.

RISK FACTORS

Age	The risk of stroke increases with age, especially after age 55.
Sex	Men are at greater risk than women.
Family	People with a family history of stroke have an increased risk of stroke themselves.
Diseases	Diabetes, heart disease especially atrial fibrillation, high BP, HIV or history of TIA/stroke
Lifestyle	Stroke risk increases with obesity, smoking, alcohol consumption and use of IV drugs.

DIFFERENTIAL DIAGNOSIS

- Hypoglycaemia
- Cerebral malaria
- Complex migraine
- Meningitis/encephalitis
- Brain abscess
- Brain tumour
- Head trauma

SIGNS AND SYMPTOMS

Depending on the region of the brain affected. Strokes on the left side of the brain primarily affect the right half of the body, and vice versa. In addition, in left brain-dominant people, left-brain strokes usually lead to speech and language deficits. A stroke can cause:

- **Limb weakness** – usually one sided
- **Facial weakness** – face drop on one side
- **Speech impairment**
- Vision loss
- Reduced sensation
- Acute severe headache
- Memory loss and decreased reasoning
- Initial low tone followed by increased tone and increased reflexes, upgoing Babinski on affected side
- Haemorrahgic stroke: more likely to get loss of consciousness, seizure, vomiting, very high BP
- Coma
- Death

DIAGNOSIS

1. Stroke is a clinical diagnosis
2. If **acute symptoms**: refer to hospital immediately
3. If **chronic symptoms**: medical history, when symptoms started, what parts of the body are affected, and risk factors. Ask about previous similar symptoms to see if the patient had TIAs before.
4. Neurological examination. A CT scan or MRI scan (if available) will confirm stroke and look for other causes e.g. tumour, bleeding.
5. ECG can find abnorma heart rhythms or heart problems that increase risk of stroke.
6. Check dextrose to rule out diabetes
7. If available: ultrasound scan of the carotid arteries to see if there is any blockage.

TREATMENT

Treatment of Acute stroke:

Note: If the stroke is very severe it may be more appropriate not to refer or give treatment and follow palliative care (*see p.224*). Discuss with the clinical team.

Note**: For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step.

Figure 20.3 DRS ABCDE chart for stroke

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **STROKE**
DRS	Danger Response Send for help	Gloves Safe place Call for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) Oxygen
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	
C	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in IV cannula – take bloods e.g. Hct, CBC, MS, dextrose etc. **Note: Do not give BP medication to reduce the BP** as the high BP may be needed to supply the brain with more oxygen
D	Check dextrose Any drugs needed e.g. antibiotics,	Give dextrose if low
E	AVPU/GCS Expose and examine all over body	**If abnormal neurology exam e.g. facial droop, one sided weakness, high tone, increased reflexes → suggests diagnosis of stroke** Review notes and charts History, further investigations, treatment plan
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

Long-term treatment:

- For comatose patients (*see p.19*)
- Fever: sometimes a stroke can cause a mild fever but need to rule out other causes as a stroke makes people more at risk of infection.
- Fluids: in an acute stroke do not give D5W as this can worsen the blood flow to the brain.
- Use BP medication cautiously because stroke can worsen if BP is too low; consult a doctor.
- Check dextrose BID and correct if low
- Start feeding as soon as possible. Strokes can affect the nerves of the swallowing (esophagous) muscles. This means there is a risk of aspiration which can cause aspiration pneumonia. When patients eat, they should be sitting upright, give thick fluid, and soft food. If the patient coughs when eating, stop eating until coughing is finished. Explain this to the family.
- Encourage the patient to move their limbs especially the weak side to try to re-gain the strength. Encourage the family to help massage and move the limbs.
- Long term aspirin (75-100mg/day) may prevent another stroke but increases bleeding risk.
- If available, a rehabilitation programme is helpful for stroke recovery. This will include physical, speech, language and mental therapy.

PREVENTION

- Treat diseases that put patients at risk e.g. medications for high BP (*see p.39*), diabetes (*see p.69*)
- Give prophylactic aspirin treatment for conditions e.g. angina *(see p.41)*.
- Advise your patients about lifestyle advice - to stop smoking, do regular exercise, eat healthy diet and avoid excessive alcohol consumption.

Education of the community about early recognition of stroke symptoms is important: early treatment depends on the victim, family members or other bystander.

20.4 BELL'S PALSY*new

DEFINITION

Acute peripheral facial nerve palsy (weakness of face muscles) of unknown cause. The risk is higher during pregnancy especially the third trimester and in the first postpartum week.

CAUSES

- Herpes zoster
- Otitis media
- Guillain-Barrè syndrome
- HIV infection
- Autoimmune disease (sarcoidosis, Sjögren syndrome)
- Tumour
- Stroke

DIAGNOSIS

The diagnosis is made clinically.

SIGNS AND SYMPTOMS

- Sudden onset, may get worse until 3 weeks
- Unilateral facial paralysis
- Cannot close the eye on the affected side
- HIV infection
- Drooping mouth on the affected side
- Decreased tears on affected side
- Possible loss of taste of the anterior 2/3 of tongue

On examination you need to confirm this is a peripheral (not central – in the brain) facial nerve palsy. If the patient cannot wrinkle the forehead then it is a peripheral problem.

Figure 20.4 Signs of Bell's palsy

A. Cannot close eye completely

B. Cannot wrinkle the forehead

TREATMENT

- If you think the examination shows a central lesion (CAN wrinkle the forehead), the patient should be referred for head imaging (head CT) to rule out a more serious problem.
- For a peripheral facial palsy (most common cause is Bell's palsy), counsel the patient that they may improve after 6 months – 1 year but need to have follow up. Older patients may not have much improvement.
- If ≤3 days since onset of symptoms, start **prednisolone** 60 mg daily for 1 week only.
- Use artificial tears (eye drops or ointment) to protect the cornea because the eye cannot close normally.
- Treat the underlying problem if found on examination (e.g. otitis media).
- Consider referral or other investigation (head CT) if the patient becomes worse.

21.1 MALNUTRITION*UPDATE

DEFINITION
Malnutrition refers to both UNDERNUTRITION and OVERNUTRITION. Previously undernutrition was the major problem on the border but now overnutrition is a rising problem. In this guideline the word malnutrition is used to describe undernutrition, and overnutrition as the opposite.

21.1.1. UNDERNUTRITION

DEFINITION
Undernutrition results from not eating enough food or not enough of the right kinds of food, or from infections that cause a loss of appetite, or changes in how the body uses nutrients.

If a child does not eat the right kind of food in the right amounts, growth slows or stops. Malnourished children are more likely to become ill and to die from illness than other children.

Children <5yr are easily malnourished if not given small frequent meals with a variety of nutritious foods, especially when they start eating solid foods and stop breastfeeding. This age-group is most vulnerable to malnutrition and most at risk from illness and death from illness. It is important to find and treat children who are malnourished.

There are different types of malnutrition:

Acute Malnutrition: wasting
Chronic Malnutrition: stunting, underweight
Micronutrient deficiency: Iron, vitamin A, vitamin B1, zinc, etc.

INDICATORS	WHAT TO MEASURE?
Wasting (acute malnutrition)	Weight-for-Height z-score
Underweight (acute & chronic malnutrition)	Weight-for-Age z-score
Stunting (chronic malnutrition)	Height-for-Age z-score

Note: if you are concerned about malnutrition, the most important step is to measure the child's weight and height and compare it to the WHO standards (*see Appendix 18*).

ACUTE MALNUTRITION IN CHILDREN
Acute malnutrition is an emergency, especially if severe. Check weight and height in **ALL** children <5yrs in the IPD or OPD to compare their **Weight-for-Height z-score** (W/H z-score). Take the weight using a baby scale (Salter Scale) and measure their height. It is good practice to compare with a previous measurement in the child's chart or lemma. Calculate the W/H z-score using the W/H z-score table (*see Appendix 18*).

DIAGNOSIS
The diagnosis of severe or moderate acute malnutrition is made clinically.

1. Severe Acute Malnutrition (there are two types)

(a) Severe wasting (marasmus)
MUAC < 115mm or W/H less than -3 z-score
Looks very thin, little fat or muscle
Lethargy, apathetic

(b) Nutritional oedema (kwashiorkor)
MUAC < 115mm or W/H less than -3z-score
Oedema of the legs, may have pitting
Skin is dry and scaly, skin disease
Child has a round 'moon' face
Lethargy, apathetic

Severe acute malnutrition can be complicated or uncomplicated
Complicated severe acute malnutrition: children diagnosed with severe acute malnutrition AND have other clinical features: infection, signs of metabolic disturbance, oedema, hypothermia, vomiting, severe dehydration, severe anaemia or no appetite (e.g. do not want to eat).

Uncomplicated severe acute malnutrition: children diagnosed with severe acute malnutrition but do NOT have signs of infection AND have a little appetite (e.g. they are able to eat).

2. Moderate Acute Malnutrition
Weight-for-Height is between -2 and -3 z-scores.

TREATMENT
Management of acute malnutrition depends on the clinical condition:

1. **Severe malnutrition**: check for any medical complications and if they have some appetite or not.
   - If have an appetite and are clinically well give OPD treatment
   - If have medical complications, pitting oedema or poor appetite need to be admitted to IPD on a Therapeutic Feeding Programme (TFP) if possible.
2. **Moderate malnutrition**: children should follow in OPD on a Supplementary Feeding Programme (SFP).

Be sure to follow the treatment protocol exactly.
The outcome depends mostly on the motivation and effort of the person feeding the child.

On Admission/When to discharge:
- Record the child's weight, height and the Weight-for-Height z-score
- Write on the chart the target weight for when you want to discharge the child home:

1. **Severe malnutrition**:
   - Discharge when Weight-for-Height is ≥ -2 z-scores and no oedema for 2 weeks in a row.
   - **Note**: re-check the child's height every month and recalculate the child's target weight.
2. **Moderate malnutrition**:
   - Discharge when Weight-for-Height is ≥ -2 z-scores for 2 weeks in a row.
   - The average stay in an Supplementary Feeding Program (SFP) is 60 days, so be patient!

MODERATE ACUTE MALNUTRITION IN CHILDREN

DIAGNOSIS
Weight-for-Height is -3 TO < -2 z-score
When you see the child for the first time in OPD, take the following steps:

1. **Evaluate the child**
   On examination look for illness, oedema, acute conditions, and vaccination status.
   Ask the parent(s) why they think child is not growing. Reasons may include:
   - No nutritious food or not enough food after stopping breast-feeding
   - Not having enough food for the family
   - Not enough small meals for the child to eat during the day
   - Illness
   - The mother must work or has another baby, so has no time to look after the patient
2. **Start systematic treatment** and treat any other diseases –diarrhoea, anaemia, other chronic infections

Figure 21.1 Treatment for malnutrition

Deworming	1-2 years > 2 years	**Albendazole** 200mg OD x 3 days **mebendazole** 100mg BID x 3 days
Vitamin A*	< 6 months 6 to 11 months (< 8 kg) 1 year and over (> 8 kg)	50,000 IU on D1, D2 and D8. 100,000 IU on D1, D2 and D8. 200,000 IU on D1, D2 and D8.
Vitamin B1		10mg OD for 6 weeks
Folic Acid		5mg on day 1, then 5mg/week for 3 months
Ferrous Sulphate	< 5 kg 5-9 kg ≥ 10 kg	50mg OD for 3 months 100mg OD for 3 months 200mg OD for 3 months
Zinc supplements	< 6 months 6 months – 5 years	10mg (1/2 tablet of 20mg) per day for 14 days 1 tablet of 20mg per day for 14 days
Other minerals (magnesium, copper) if available.		
***Note:** there should be 1 month between a preventive vitamin A dose and a treatment dose – check the child's vaccination card. If they have been referred from Therapeutic Feeding Program (TFP), do not re-treat for vitamin A or deworm. Continue with other treatment.		

3. **Check child's vaccination card**
   Give all vaccines according to up to date protocol, if not already given.

4. **Encourage a normal diet**
   Counsel to the caregiver that the child should eat normal foods as often as they want but do not force to eat. Eat different kinds of food. A combination of animal-source and plant-source foods is better than the rice-only diet. Frequency of meals depends on the child's age:

   - **Birth-6mo**: exclusive breast-feeding is preferred and increase the frequency
   - **6-9mo**: breast-feeding and 3 additional meals of different types of food, first 2-3 spoons each then increase the amount as tolerated (i.e. mashed banana, rice, cooked egg, Asia Remix, etc.)
   - **9-12mo**: breast-feeding and 4 additional meals up to ½ cup (125ml) each, can start to eat food cut into small pieces
   - **12-24mo**: breast-feeding and 5 additional meals ¾ cup to 1 cup (250ml) each, increase food diversity
   - **Over 24m**: transition to 'family' food with as much diversity as possible

Important: If any SFP food is given (i.e. in the camps), this should be given in-between meals.

5. **Ask the mother to return every week to the clinic**

6. **Weigh the child weekly and mark it on the growth chart**
   - Expected average weight gain for a child 6-59m following an SFP should be **≥3g/kg/day**
   - If the child does not gain weight after 2 weeks in the program, reassess for underlying causes.
   - If the child does not gain weight regularly within 6 weeks, admit to IPD for supervised feeding.
   - If the child is in a camp, try to find out if every member of the family is registered for, and receiving, adequate rations before discharging the child.

7. **Explain to the mother**
   When the mother stops breastfeeding, her children need to eat a variety of foods to stay healthy and grow properly, including rice, beans, fruits, vegetables, meat, eggs, and fish.

8. **Ensure follow-up health and nutrition education in the household by home visitors**
   Give booster vaccines using up to date protocols.

SEVERE ACUTE MALNUTRITION IN CHILDREN

DEFINITION
Weight-for-Height < -3 z-score OR bilateral pitting oedema OR MUAC < 115 mm

Severe acute malnutrition is a **MEDICAL EMERGENCY.** Most children will be hospitalized and need constant monitoring. The new guidelines (2013 WHO guideline) say that children who have an appetite and are alert and well can be treated as outpatients, Children with medical complications, severe oedema or poor appetite should be hospitalized.

TREATMENT*UPDATE
The management of a very severely malnourished child contains 3 phases:

Phase 1 Initial medical treatment.
The patient is started on special feeding but is not expected to gain weight.

Phase 2 The nutritional part of the treatment of the patient (rehabilitation).

Phase 3 Follow-up after discharged from the treatment program in order to avoid a relapse

Figure 21.2 Time schedule for severe malnutrition management (Management of severe malnutrition: a manual for physicians and other senior health workers, WHO 1999)

Table 1. Time-frame for the management of a child with severe malnutrition

Activity	Initial treatment:		Rehabilitation:	Follow-up:
	days 1–2	days 3–7	weeks 2–6	weeks 7–26
Treat or prevent: hypoglycaemia, hypothermia, dehydration	→			
Correct electrolyte imbalance	→	→	→	
Treat infection	→	→		
Correct micronutrient deficiencies	← without iron	→	with iron →	
Begin feeding	→	→		
Increase feeding to recover lost weight ("catch-up growth")		→	→	→
Stimulate emotional and sensorial development	→	→	→	→
Prepare for discharge			→	→

PHASE 1

In general: It takes a lot of time to feed these children, because they are very weak (lethargic) and have a poor appetite. Be sure to explain this to the family, because they will have to invest a lot of time feeding the child regularly under the supervision of a medic or nurse.

High Energy Milk (HEM)

To avoid overloading the intestine, liver and kidneys, it is very important that the food is given frequently and in small quantities at the beginning of the treatment, follow the instructions below. Use only a naso-gastric tube (NG) when the child cannot drink.

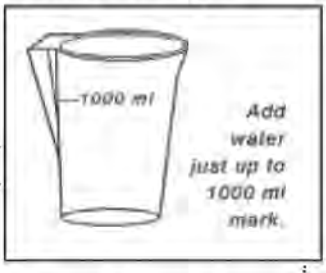
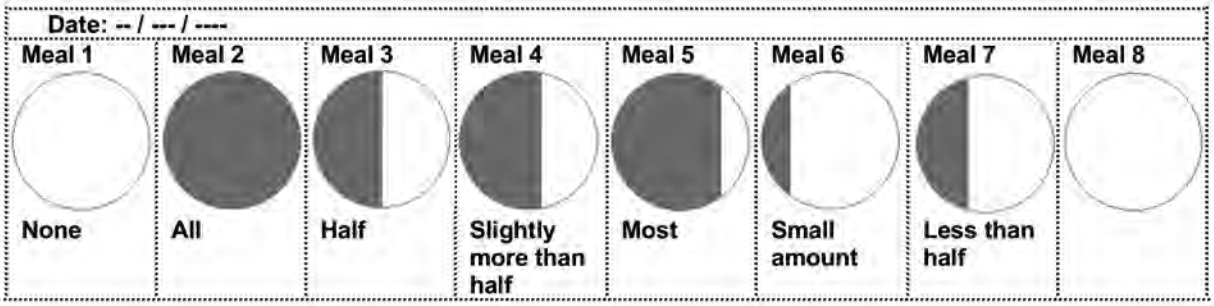


Figure 21.3 How to make Phase 1 high energy milk (HEM)*new

HOW TO MAKE PHASE 1 - HIGH ENERGY MILK (H.E.M.)	
Ingredients and Amounts: Dried skimmed milk 25 g Sugar 100 g Vegetable Oil 27 g Cooled Boiled water 1 L	**Instructions:** Mix milk powder and sugar in a large pot or jug Add oil and stir to make a paste Add the cooled boiled water SLOWLY, stirring all the time. Add enough water to reach the 1000ml (1 litre) line. Stir completely until liquid is smooth Add mineral mix if available (from UNICEF).
Number of Meals	**8-12 meals per 24 hours**
Time of meals	**8 meals every 3 hours** **12 meals = every 2 hours**
Volume per meal (6m – 5yrs)	**135ml/kg per 24 hours**
****DO NOT STORE AND RE-USE HEM THAT HAS NOT BEEN EATEN – IT CAN CAUSE DIARRHOEA****	

Figure 21.4 How to record the amount of food eaten in a child with malnutrition

For example, if the child is given 8 meals in 24 hours, draw 8 circles and color in how much the child ate.



1. **Weigh the child daily and record on the weight chart**

2. **Prevent hypoglycaemia**
   An important cause of death in the first 48 hours of IPD. Do not stop breast-feeding. Give frequent, small quantities of food during day and night. Some very weak children will need feeding every hour.

3. **Prevent the child from becoming cold** (hypothermia)
   Encourage the mother to hold the child close to her at all times. Do not bathe the child in the first days.

4. **Manage dehydration**
   Assessment of dehydration is difficult: the skin is already loose and eyes sunken in these children: look in the mouth and at the eyes to see if they are moist. Ask if the child is passing urine normally.
   - **Avoid IV rehydration** if possible.
   - Use diluted ORS solution (in normal ORS there is too much salt and not enough potassium) or **Re**hydration **So**lution for **Mal**nutrition (ReSoMal).
   - Continue breast-feeding.
   - Treat the mother for any illness and worms, make sure she eats well and drinks lots of fluids. Give her Vitamin A, ferrous sulphate, folic acid, vitamin B1 so that she can produce enough milk containing vitamins and iron for her baby. Provide the mother with clean drinking water.
   - Monitor the child's vital signs and urine output.
   - By continuing breast-feeding, preventing hypoglycaemia and managing dehydration, electrolytes imbalance will most likely be corrected

   HOW TO MAKE DILUTE ORS *(see ORS preparation, Appendix 8)*

   1 packet (size for 750ml water) of ORS powder + **1500**ml clean water + 30g sugar + 1.5g potassium

   OR

   1 packet (size for 1L water) of ORS powder + **2000**ml clean water + 40g sugar + 2.5g potassium

5. **Treat infections**
   A severely malnourished child can have severe infections without fever. Septic shock is a serious complication of severe malnutrition and respiratory infections are very common.

   Give all severely malnourished children a broad-spectrum antibiotic:

   - **Stable/ no signs of infection AND no complications**
     - Amoxicillin 15mg/kg TID for 5 days
   - **Severely ill (apathetic, lethargic) OR complications** (hypoglycaemia, hypothermia, broken skin, respiratory tract infection
     - **Ceftriaxone** 50mg/kg OD
       OR
     - If pneumonia: **ampicillin** 50mg/kg IM/IV QID AND **gentamicin** 7.5mg/kg IM/IV OD for 5 days

   If specific infections are detected (e.g. skin infection, pyelonepritis) then treat accordingly.
   DO NOT FORGET TO DO A MALARIA SMEAR!

6. Correct micronutrient deficiencies

Vitamin A*:	< 6 months 6 to 11 months (< 8 Kg) 1 year and over (> 8 Kg)	50,000 IU on D1, D2 and D8 100,000 IU on D1, D2 and D8 200,000 IU on D1, D2 and D8
Vitamin B1:	10mg daily for 6 weeks	
Folic acid:	5mg on day 1 and then 5mg/week for 3 months	
Zinc supplements:	< 6 months 6 months – 5 years	10mg (1/2 tablet of 20mg) per day for 14 days 1 tablet of 20mg per day for 14 days.
Other minerals (magnesium, copper) if available.		

Note: DO NOT GIVE IRON OR DE-WORMING MEDICATION UNTIL PHASE 2

***Note:** there should be 1 month between a preventive vitamin A dose and a treatment dose – check the child's vaccination card. If they have been referred from TFP, do not re-treat for vitamin A or deworm. Continue with other treatment.

7. Check vaccination card

Give **measles vaccine** if child is > 6m and not immunized. Do not give if the child is in shock. Give other vaccinations in phase 2.

PHASE 2

A child enters this rehabilitation phase when a good appetite returns.
A child with a naso-gastric tube cannot enter phase 2. The child must be able to eat.

1. Switch to Phase 2 HEM

Start with the **same quantity (ml) of HEM as in Phase 1,** but use Phase 2 – HEM.
(this solution contains more calories than the Phase 1 HEM)

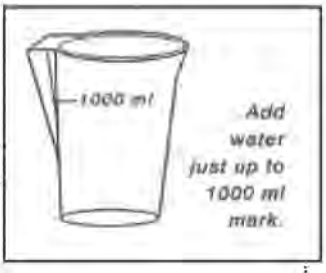


Figure 21.5 How to make Phase 2 high energy milk (HEM)*update

HOW TO MAKE PHASE 2 - HIGH ENERGY MILK (H.E.M.)	
Ingredients and Amounts:	**Instructions:**
Dried skimmed milk 80 g Sugar 50 g Vegetable Oil 60 g Cooled Boiled water 1 L	Mix milk powder and sugar in a large pot or jug Add oil and stir to make a paste Add the cooled boiled water SLOWLY, stirring all the time. Add enough water to reach the 1000ml (1 litre) line. Stir completely until liquid is smooth Add vitamin and mineral mix if available (from UNICEF).
Number of Meals	**6 meals per 24 hours**
Time of meals	**6 meals = every 4 hours**
Volume per meal (6m – 5yrs)	**200ml/kg per 24 hours**
****DO NOT STORE AND RE-USE HEM THAT HAS NOT BEEN EATEN – IT CAN CAUSE DIARRHOEA****	

Increase meal size

If the child finishes the meal, increase the size of the next meal by 10ml. Slowly add other foods. The amount of HEM and other foods can be increased according to the appetite of the child.
The child should still be fed day and night. Follow this schedule of meals spread over 24 hours:

TIME	EXAMPLES OF MEAL
6 am	PHASE 2 HEM
8 am	LOCAL MEAL – AsiaMIX porridge + banana + egg
10 am	PHASE 2 HEM
12 pm	LOCAL MEAL – rice + beans + tinned fish
2 pm	PHASE 2 HEM
4 pm	LOCAL MEAL – AsiaMIX pancake with sugar and milk or rice, oil and egg
6 pm	PHASE 2 HEM
10 pm	PHASE 2 HEM
2 am	PHASE 2 HEM

2. **The child should gain 10-20g body weight / day.**
   If the child has already improved from phase 1 to phase 2 and does not continue to gain weight for 3 days (secondary failure) and feeding is supervised; consider infection and chronic illness:
   - Check for chronic diseases, such as TB, HIV, thalassaemia, cardiac disease, hepatitis B.
   - Check for infections, such as diarrhoea, pneumonia, UTI, parasitic infection.

3. **Continue medicine treatment started in Phase 1, start iron and de-worm.**
   - Continue with Folic Acid, vitamin B1 and Zinc supplements.
   - Add **mebendazole** or **albendazole**
   - Add **ferrous sulphate** after 2 weeks of admission or when the child moves into Phase 2.
     <5 kg: 50mg OD for 3 months
     5-9 kg: 100mg OD for 3 months
     >10 kg: 100mg OD for 3 months

4. **Check child's vaccination card**
   Give all vaccines according to up to date protocol if not already given.

5. **Consider switch to OPD treatment**
   When the child reaches -2 z-scores W/H and stays at least -2 z-scores for 2 weeks in a row, no longer has oedema, and is free from infection: refer to OPD for the Supplementary Feeding Programme (SFP).

6. **Emotional and physical stimulation**
   These are an important part of the treatment as severely malnourished children often present some degree of mental and behavioural delay. Mother and other family members need a lot of support and encouragement in order to prevent malnutrition from returning.

PHASE 3

Post discharge:

The risk of relapse is greatest just after discharge.
- Plan to follow-up the child regularly, first weekly, then monthly and finally 3-monthly.
- Continue to monitor weight and height and report the results to the mother.
- Continue advice on feeding practices, provide all micronutrients or vitamins necessary
- Ensure that any booster vaccines are given according to up to date protocols.

A SPECIAL CONSIDERSTION: dermatosis of kwashiorkor

This is characterized by shedding of the skin, ulcerations, weeping skin lesions which easily become infected. It can improve spontaneously as nutrition improves, but it also can lead to severe diaper rash especially if the child has diarrhoea. The area should be left uncovered; apply nystatin cream/ointment, or zinc to relieve pain and prevent infection. Bathing the affected area with 1% potassium permanganate solution for 10-15 minutes daily can also help to dry the lesions.

21.1.2. ACUTE MALNUTRITION IN ADOLESCENTS AND ADULTS

MODERATE ACUTE MALNUTRITION

Moderately malnourished adolescents and adults are not normally admitted to feeding programs unless they are severely malnourished and in poor clinical condition.

DIAGNOSIS

For adults, the international definition of obesity is the **Body Mass Index (BMI)**. BMI is used to diagnose underweight, overweight or obese. BMI can also help know risk of a chronic disease. **BMI is used for non-pregnant adult only.** *See Figure 21.6 (next page) for how to calculate BMI.*

Adolescents:	**3 to <-2 Z-score BMI-for-age** (*see Appendix 18*)
Adults:	**BMI 16-16.9** (calculate: weight (kg) / height2 (m), *see Appendix 18* • The person is thin and has bi-lateral pitting oedema
Pregnant and Lactating Women:	**MUAC < 230mm** • (use MUAC if no weight/height, *see obstetric guidelines*)

TREATMENT

- Moderately thin adolescents and adults require an additional 20-30% caloric intake and should be treated in outpatient care
- If available, depending on underlying condition(s), 1-4kg of Asia REMIX and 1.5L of vegetable oil is provided to take home each month with nutrition education and promotion provided on using the foods provided at every distribution. (*Refer to the Guidelines for Supplementary Feeding and Medical Faculty Food Provision, TBC, 2012*)
- Refer to community or home-based nutritional interventions or food security initiatives, if possible
- Ensure follow-up home visits and assessment

SEVERE ACUTE MALNUTRITION

Adolescents and adults with severe malnutrition, have low weight for height (*see Appendix 18*):

DIAGNOSIS

Adolescents:	**Less than -3 z scores BMI-for-age** or poor clinical condition • Bilateral oedema not attributable to other causes. • Clinical marasmus – extreme thinness. • Night blindness. • Extreme pallor (paleness) – severe anaemia. • Vitamin and mineral deficiencies.
Adults:	**BMI<16** (calculate: weight (kg) / height2 (m). • Thin and has bilateral pitting oedema.
Pregnant and Lactating Women:	**MUAC <207 mm** (BMI <16 kg/m2) • (use MUAC if no weight/height, *see obstetric guidelines*)

These patients are **severely acutely malnourished** and need therapeutic feeding.

MANAGEMENT

- Investigate all possible sources of acute malnutrition including diabetes mellitus, TB, HIV and treat underlying cause.
- First phase of treatment is similar to that of children including prevention of hypoglycaemia, hypothermia, control of infections and giving vitamins.
- Feeding often requires naso-gastric tube as most of acutely malnourished adults are anorexic. The amount of food given per kg of body weight is lower than for children and decreases with age.

Note: vitamin A 200 000 IU as single dose should not be given to pregnant women

PHASE 1
Feeding should be frequent (at least 6 meals per day).

PHASE 1 - HIGH ENERGY MILK	
Number of meals	6 to 8 meals per 24 hours
Time of meals	6 meals = every 4 hours 8 meals = every 3 hours
Volume per meal	**depends on the age of the patient:**
6-10 years	135 ml/kg per 24 hours
11-18 years	55 ml/kg per 24 hours
18-75 years	40-55 ml/kg per 24 hours
> 75 years	35-45 ml/kg per 24 hours

PHASE 2

- Same as for children, improved appetite is the beginning of rehabilitation in adolescents and adults.
- Adolescents and adults may become very hungry and refuse the formula feed. A normal diet should be then given, but with added oil, mineral mix and vitamin mix if possible. Allow the patients to eat as much as they want and give a wide variety of foods. Eat at least 6 times a day.
- Be sure that they eat a variety of foods other than rice (rice fills the stomach quickly, but it is not very nutritious), and small amounts of rice or noodles.

Adults should continue to receive a supplemented diet as outpatients until their BMI is > 18.5 kg/m2 and adolescents until their BMI-for-age is >5th centile of the median reference values. Pregnant and lactating women should receive supplemented diet until the child is weaned from breastfeeding.

21.2 OVERNUTRITION

DEFINITION
An obese person is too heavy for his/her height compared to standard weight tables. Obesity is a risk factor for many diseases and reduces life expectancy.

Overweight = having extra body weight from muscle, bone, fat, and/or water.
Obesity = having a high amount of extra body fat.
Central/abdominal obesity (or apple shape body): too much visceral fat (fat around organs), may have normal BMI but still at risk for heart disease and type 2 diabetes.

Obesity is a risk factor for:

- Heart disease
- High blood pressure
- Stroke
- Sleep apnea
- Type 2 diabetes
- Dyslipidaemia (cholesterol)
- Some cancers
- Gall bladder disease

CAUSES

- Eating too much food (too many calories), and/or not physically active enough
- Diseases such as endocrine diseases (rare)
- Medications e.g. long-term steroids

DIAGNOSIS
For adults, the international definition of obesity is the **Body Mass Index (BMI)**. BMI is used to diagnose underweight, overweight or obese. BMI can also help know risk of a chronic disease. **BMI is used for non-pregnant adult only.**

Figure 21.6 How to calculate BMI

Step 1: Check the weight on the scale in kilograms.
Step 2: Measure height in meters
Step 3: Square the answer from STEP 2 (multiply the number of meters by the same number of meters).
Step 4: Calculate BMI by dividing the answer from STEP 1 by the answer from STEP 3.

$$BMI = \frac{weight\ (kg)}{height\ (m)\ x\ height(m)}$$

Figure 21.7 How to use BMI

These are the cut off values for BMI for >19 yrs according to WHO standards for Asian populations:

CLASSIFICATION	BMI (kg/m^2)
Underweight	≤ 18.5
Healthy	18.5 to 22.9
Overweight (increased risk)	23 to 27.4
Obese (high risk)	≥ 27.5

Note: the cut off values for BMI are not the same for all people due to the difference in body shape and risk of disease in different populations (e.g. Asian's have a higher risk of developing cardiovascular disease at a younger age).

For example: a 70kg man who is 1.6 metres tall

$$\text{BMI} = \frac{70}{1.6 \times 1.6} = \frac{70}{2.56} = \text{BMI of 27 = overweight}$$

Note: **BMI may** **overestimate** body fat in people who have a muscular build e.g. athletes.
underestimate body fat in older persons or others with muscle loss.

WAIST CIRCUMFERENCE

Sometimes, even if BMI is within normal range, having too much visceral fat (fat that accumulates around organs) called **central/abdominal obesity** (or apple shape body) still put a person at **risk for heart disease and type 2 diabetes.** To measure central obesity use the waist circumference.

How to measure the waist circumference:

- Use a tape measure and measure around the abdomen just above the belly button (naval).

How to use the waist circumference:

- Normal figures are: Men ≤ 90cm
  Women ≤ 80cm

Figure 21.8 Using waist circumference and BMI to measure the risk of co-morbidities

CLASSIFICATION	**BMI (kg/m^2)**	**RISK OF CO-MORBIDITIES**	
		waist circumference	
		< 90 cm (men) < 80 cm (women)	≥ 90 cm (men) ≥ 80 cm (women)
UNDERWEIGHT	≤ 18.5	Low, but risk of other health problems	Ok
HEALTHY	18.5 – 22.9	Ok	Increased
OVERWEIGHT	23 - 27.4	Increased	High
OBESE	≥ 27.5	Very high	Very high

MANAGEMENT

1. Screening for high blood pressure: If the patient is >40 yrs OR overweight or obese OR had a BP >130/90 in the past, check for high blood pressure every year.
2. If overweight/obese adults have a baseline BP >135/80, consider screening for type 2 diabetes through fasting blood glucose or OGTT or HbA1c.
3. Counselling
   - EXERCISE - at least 30 minutes every day: e.g. walking, playing football, gardening.
   - STOP SMOKING - if cannot stop then try to decrease. Passive smoking (inhaling smoke from someone else who smoking) is also bad for you
   - STOP ALCOHOL - if cannot stop then try to decrease.
     - *Women*: no more than 2 drinks/day (on average)
     - *Men*: no more than 3 drinks/day (on average)

- DIET

General advice:

- Few smaller meals during the day, rather than eat one or two very heavy meals
- Avoid heavy meals or snacks just before sleeping
- Avoid food that result in a sudden rise in sugar levels (e.g. sugary drinks), better to eat foods that cause a slow release of sugar into the blood (e.g. health carbohydrates)

Specific Advice:

1. Eat high fibre food
- Rice and oats, whole grain breads and cereals, beans, peas, fresh fruits and vegetables
- Fibre is not broken down (digested) by the body, and it does not raise calories or glucose levels so makes you feel full without the bad effects.

2. Try to eat healthy carbohydrates
- Brown and wild rice, whole wheat, corn, peas, boiled dry beans.
- White flour and white rice taste better, but they are less filling and increase blood sugar.

3. Eat a lot of vegetables and fruits regularly
- They are a good source of fibre
- Take a piece of fruit for a snack at work.

4. Eat moderate amounts of fat
- Replace butter and coconut oil with grape seed oil, olive and peanut oil.
- Add only ½ to 1 teaspoon of oil per person
- Do not batter and deep fry, but poach, grill or boil in soup
- Eat fish and shellfish which are naturally low-fat
- Remove excess fat from meat, remove skin from poultry
- Avoid fried foods. Eat roasted or baked food (baked or boiled potatoes vs. potato chips)

5. Limit salt intake
- Most salt comes from pre-packaged food e.g. potato chips so try to avoid these
- Try to replace with herbs, spices, lemon juice when cooking
- In patients with high blood pressure reducing salt is very important

6. Reduce sugar
- Sugar is present naturally in some foods (e.g. fruits) or is added (e.g. sweet drinks)
- Too much sugar also causes dental caries
- Main source of sugars: bread, breakfast cereals, rice, noodles, corn, potato, fruit, milk, yoghurt, sugar, biscuits, cakes, candies, soda. Try to eat less of these foods.

Note: When counselling on diet it is also discuss **hygiene and eating clean and safe food** to prevent infection:

- Wash hands with soap
  - after using the toilet
  - after cleaning children who have used the toilet
  - before preparing meals
  - before eating
  - after stroking animals
- Make sure that raw vegetables have been washed and rinsed before cutting or skinning them.
- Boil the water if it comes from the community tap, well, rainwater or a stream.
- Prevent your food and cooking oils from smoking or burning. Burnt food contains acrolein which is bad for you. **Oil used for deep frying should not be reused!**

Be careful when prescribing drugs to obese people. For some medication you may need to change the dose.

21.3 VITAMIN DEFICIENCIES

21.3.1. VITAMIN A DEFICIENCY

DEFINITION

Vitamin A deficiency is a major cause of blindness, and is a significant factor in many childhood illnesses, especially diarrhoea and pneumonia. Vitamin A deficiency mostly affects small children but can also affect adults, especially women of reproductive age.

SIGNS AND SYMPTOMS

The signs and symptoms of vitamin A deficiency are found in the eyes. These include night blindness ('chicken blindness'), conjunctival dryness (*see p.85*), Bitot's spots (grey-white spots on conjunctiva), dry cornea and some types of cornea damage.

DIAGNOSIS

Early clinical recognition and treatment can avoid severe complications and permanent blindness.

TREATMENT

Children less than 6 months
50,000 IU on days 1, 2, and 8

Children 6-11 months
100,000 IU on days 1, 2, 8

Children age 1 year and older and adults (>8 kg)
200,000 IU on days 1, 2, and 8

Women of reproductive age
25,000 IU once a week for **8 weeks**

Vitamin A capsules come in two sizes 200,000 IU (International Units) and 25,000 IU capsules. Read the bottle for the strength of the capsules. Write down carefully on the health record the date and dose of treatment. Do not give treatment more often than every 4-6 months because too much Vitamin A can causes hypervitaminosis (this can occur with vitamins A, D, E, and K).

Treatment for pregnant woman
For **night blindness and Bitot's spot**: 10,000 IU PO daily OR 25,000 IU PO weekly for at least 4 weeks
For **corneal dryness and corneal ulcer/keratomalacia**: 100,000 IU on days 1, 2, and 8 (Discuss with doctor BEFORE using this dose)

Give a treatment dose of vitamin A even if they have received a recent prevention dose to:

- All patients with confirmed signs or symptoms of vitamin A deficiency
- All cases of moderate and severe malnutrition
- All children with measles
- All children with severe respiratory infections and severe diarrhoea requiring admission to IPD

PREVENTION

The cause of vitamin A deficiency is a lack of food containing vitamin A. This is found in leafy green vegetables, eggs, many kinds of meat, mango, papaya, pumpkin and many fruits. The mother's breast milk is a very important source of Vitamin A. Rice, bananas and oranges contain little or no vitamin A.

Some people cannot afford meat, eggs and other foods with vitamin A. Give treatment to children to prevent deficiency. **A single dose of 200,000 IU will provide one child with enough vitamin A to last 4-6 mo.**

Vitamin A preventive doses

Newborn	50,000 IU	at birth
Less than 6 months (if not given at birth)	50,000 IU	at the clinic visit
Children 6 months to one year	100,000 IU	every 4-6 months
Children one year and older	200,000 IU	every 4-6 months
Mothers (within 1 month of delivery)	200,000 IU	at delivery and 200,000 the next day

- Before giving a preventive dose of vitamin A check if one has been given in the last 4 months.
- **Note**: Most capsules are 200,000 IU (International Units) in strength. If you need to give a smaller dose, such as 100,000 IU cut the capsule with scissors and give 3 drops to the child.

Do NOT give a high dose to a woman who is pregnant or could be pregnant (age 15 – 50 years).
If a treatment dose has been given in the past 1 month, do not treat again.
Wait for one month to pass between treatments and re-evaluate.

21.3.2. VITAMIN B1 DEFICIENCY

DEFINITION

Vitamin B1 deficiency occurs when there is not enough vitamin B1 in the body due to an insufficient diet. This was common along the border, especially in pregnant and breastfeeding women and their babies. The disease may present in different ways, known as '**Dry Beriberi,**' and '**Wet Beriberi**,' or in combination. In alcoholics or very severe malnutrition, low vitamin B1 levels can cause **Wernicke's Encephalopathy** or **Korsakoff's syndrome**. Most vitamin B1 deficiency seen on the border is mild. The clinical presentation and management is different in adults and infants.

BERI BERI

DIAGNOSIS OF BERIBERI IN ADULTS AND OLDER CHILDREN

This is a clinical diagnosis.

SIGNS AND SYMPTOMS IN ADULTS AND OLDER CHILDREN

Dry Beriberi

Mild
- Numbness
- Burning sensation or tingling in lower legs or hands

Severe
- Reduced tendon reflexes
- Weakness: the person cannot walk alone or stand up from squatting position

Wet Beriberi
- Oedema (legs, trunk, face), hepatomegaly
- Difficulty breathing
- A rapid pulse that can lead to heart failure

TREATMENT IN ADULTS AND OLDER CHILDREN

Note: take vitamin B1 tablets 1 hour before meals.

Give B-Complex or multivitamins. Other B vitamins may be deficient in the patient also.
- **Mild deficiency** (Mild dry Beriberi)
  - Vitamin B1 PO 100mg OD x 7 days THEN 10mg OD x 6 weeks
- **Severe deficiency** (Wet Beriberiand Dry Beriberi with severe signs)
  - Admit to IPD
  - Vitamin B1 IM 100mg TID for 1 day, THEN
  - Vitamin B1 PO 100mg OD x 7 days then PO 10mg OD x 6 weeks

Advise patients not to chew betel-nut or eat lepetho when taking vitamin B supplements: betel-nut destroys the vitamin B1

PREVENTION IN ADULTS AND OLDER CHILDREN

Patients should be counselled to do the following to prevent vitamin B1 deficiency:
- Eat a variety of foods (for example yellow beans, meat, fruits and vegetables).
- Do not chew betel-nut or lepetho (fermented tea-leaf salad) just before or after meals because it will block the absorbtion of vitamin B1 from food. Wait several hours.
- Wash rice only once before cooking and use the cooking water to make other food
- Advise to eat unpolished rice and to cut down fish paste if possible.

To prevent vitamin B1 deficiency in pregnant women and their babies: Give vitamin B1 PO 100mg daily to all pregnant and breastfeeding women up to 6 months of breastfeeding

DIAGNOSIS OF BERI BERI IN INFANTS

Beriberi is common in babies <1 year who are breast-fed and whose mothers have Vitamin B1 deficiency or low intake of Vitamin B1.

SIGNS AND SYMPTOMS IN INFANTS

Think of Beriberi in previously healthy babies when they present with one or more of the following signs:

- Difficulty breathing, or fast RR >50/min
- Clear lungs on auscultation
- Generalised oedema
- Voice change or loss of voice
- Cyanosis
- Fast pulse
- Low urine output
- Not sucking well
- Enlarged palpable liver
- Vomiting
- Convulsions

Beri Beri in an infant is an emergency. The infant may look septic.
If vitamin B1 is not given, the infant will die quickly.

TREATMENT IN INFANTS

1. Admit to IPD
2. High dose **vitamin B1**: 50mg (0.5ml) **IM** TID for 1 day, THEN 10mg **PO** OD x 6 weeks
3. Treat the mother: Vitamin B1 PO 100mg OD x 7 days, THEN 10mg OD x 6 weeks

Counsel the mother to stop eating betel nut and snack food for 6 weeks. These make the symptoms worse. Take vitamin B1 tablets 1 hour before meals.

WERNICKE'S ENCEPHALOPATHY

DEFINITION

Neurological symptoms develop from low B1 levels on the central nervous system. Most common in people who have a long history of alcohol excess. Symptoms are often reversible with treatment. *See p.188, Alcohol substance abuse.*

SIGNS AND SYMPTOMS

- **Ophthalmoplegia** (abnormal eye movements)
- **Ataxia** (poor balance, unable to walk normally)
- **Confusion**
- **History of alcohol excess/very poor diet**
- Seizures
- Memory problems

TREATMENT

- High doses of **Vitamin B1**: 250mg IV/IM TID.
- IM is painful – best to dilute B1 in 100ml NSS and give IV.
- Continue high dose until patient symptoms stop improving.
- Consider replacing other vitamins which are likely to be deficient and long term B1.
- Encourage stopping alcohol, counsel on diet (*see above*)

KORSAKOFF'S SYNDROME

DEFINITION

Neurological condition caused by low thiamine. More common in chronic alcohol abuse and severe malnutrition. Some of the symptoms are not reversible with treatment. *See p.188, Alcohol substance abuse.*

SIGNS AND SYMPTOMS

- Memory loss
- Confabulation – makes up gaps in memory
- Minimal conversation
- Loss of interest
- Lack of insight

TREATMENT

Same as for Wernicke's encephalopathy

Wernicke-Korsakoff Syndrome is when the two conditions occur together.

DEFINITION

Cancer is a tumour caused by abnormal very fast growth of cells in the body. The cells can spread to other parts of the body. Sometimes cancers can have non-specific symptoms e.g. weight loss and lethargy, but other times there can be more specific signs and symptoms for each cancer (*see Figure 21.1*).

Oncology is the treatment of cancer. Treatment is sometimes surgery (to remove a very large mass), chemotherapy (drugs to kill the cancer cells) and radiotherapy (radiation beams to kill the cancer cells). Treatment will not work for all cancers, especially more advanced cancers. Treatment is expensive and not usually available. Specialist review (if possible) is needed.

Palliative care is the management of a patient who is near to the end of their life and there is no treatment available to cure them e.g. advanced cancer, very severe COPD, rabies with symptoms. It is necessary to make sure patients have control of their symptoms and have a peaceful end to their life.

22.1 ONCOLOGY

SIGNS AND SYMPTOMS

All cancers can cause weight loss. In addition, there are specific symptoms that you should be aware of that may make you think of cancer as a diagnosis:

Figure 22.1 Specific cancers: Signs and symptoms and investigations that may be available at border clinics

	Signs and Symptoms	**Investigations**
Oesophageal/Mouth Cancer	Difficulty swallowing, initially to solids but then to liquids, may see mass in mouth, history of betel nut chewing	Oesophageal gastro-duodenoscopy (if available)
Lung Cancer	Prolonged cough, haemoptysis, clubbing, history of smoking	Chest X-ray
Stomach Cancer	Epigastric pain, vomit with blood, melaena, large lymph node above the left clavicle	Ultrasound may or may not identify a mass
Bowel Cancer	Change in bowel habit especially in elderly, blood in stool	Colonoscopy (if available)
Bone Cancer	Feel mass on bone, chronic bone pain, unable to straighten joint, limp	Bone X-ray
Blood Cancer	Large lymph nodes, frequent infections, night sweats	CBC, thin film
Brain Tumour	Headache, signs of raised intracranial pressure, change in personality/function	Head CT or MRI (if available)
Pancreatic/Gallbladder Cancer	Jaundice with no abdominal pain, may have epigastric mass	Ultrasound may or may not identify a mass
Liver Cancer	Jaundice, history of hepatitis B/C or cirrhosis	Ultrasound may or may not identify a mass

DIAGNOSIS AND TREATMENT

There are limited resources available to investigate cancer, and the diagnosis at border clinics is often clinical. Actually, diagnosis needs biopsy and intensive investigation. Ultrasound may be helpful to look for a mass e.g. in the abdomen (but can be difficult), and an X-ray may help to find some cancers.

If you suspect cancer, refer for further investigation and treatment or send home with palliative treatment and follow up.

22.2 PALLIATIVE CARE

TREATMENT

Care can be divided into palliative medical care, psychological support for the patient, and psychological support for the family/care givers.

1. **Palliative medical care**
   - Teach the family when and how to give pain relief/other medications
   - Drugs and materials are needed e.g. provide gloves or materials for dressings.

   General Care:
   - Oral care use soft toothbrush, or rinse mouth with diluted salt water after eating.
   - Prevent bedsores by moving patient every 1-2 hours, use cushions to keep position.
   - Prevent pain, stiffness and contractures in muscles and joints. Gently move and massage limbs.

   Symptom Treatment:
   - Educate the family to look out for symptoms e.g. pain, constipation, vomiting etc. and when to ask for help. This is how to treat some of the common symptoms:

Figure 22.2 Palliative treatment for specific symptoms

Anorexia:	**Prednisolone** 5-15mg OD in the morning to increase appetite, stop if no help after 2 wk
Anxiety:	**Diazepam** 2.5-5mg at night or BID (not more than 2 weeks)
Chronic Diarrhoea:	**Loperamide** 4mg once then 2mg per loose stool (max 16mg/d) or opioids (like **codeine**) (if available)10mg TID (max 60mg every 4hrs)
Constipation:	Increase **oral fluids**, eat **high fibre foods** e.g. fruit and vegetables, use **laxatives** if available
Emotional support:	Physical methods e.g. touching (stroking, massage), ice/heat, deep breathing Cognitive methods e.g. distraction with radio, music, imagining pleasant scene, prayer
Dehydration:	Dehydration may decrease drug excretion from the body and so increase drug side effects, like hallucinations or myoclonic jerks. This is particularly true for morphine. Try to **stop unnecessary medication** or **decrease the dose** while maintaining symptom control. Can give **extra fluids** for a short period of time for strong adverse effects.
Delirium/ confusion:	Mild agitation: **Diazepam** 5-10mg OD to TID Severe delirium: Haloperidol 1.5-5mg up to TID until improved or **Chlorpromazine** 25-50mg PO/PR TID (if available). Add **Diazepam** as above, but do not use Diazepam alone for severe delirium because it might make confusion worse
Insomnia:	**Diazepam** 5-10 mg HS, use only prn and do not use for chronic insomnia.
Itching:	**Chlorpheniramine** 4mg QID (max 24mg/day). Assess for cause.
Mouth ulcers:	**Prednisolone** crush a 5mg tablet and apply a few grains on to ulcer
Muscle Spasm:	**Buscopan** 10mg TID (max 20mg QID)
Nausea/Vomiting:	**Metoclopramide** 10 mg TID
Oral/Oesophageal Thrush:	**Nystatin** 1 tablet to be sucked QID for 7 days or 1ml of oral suspension (100,000 IU) QID for 7 days (total 400,000 IU per day) to swish and swallow.
Pain:	Make a plan for adequate pain relief (*see p.32*). If not better, try different pain medications to see what helps the patient. Encourage other methods for pain control.
Urinary incontinence:	Male: use plastic drinks bottle over penis Females: cotton cloth pads or plastic pants, wash and dry between use

2. **Psychological support for the patient**
   - Be honest about the outcome of the illness and treatment.
   - Respect the patient, even if there is social stigma surrounding their illness.
   - Be aware of the psychological and spiritual aspects of patient care e.g. allowing relatives and close personal friends access to the patient.
   - Feelings of sadness, anger, fear, anxiety, regret, psychological stress are common. Medication does not make the feelings go away, be open and listen in a non-judgmental way to patient concerns.
   - Confidentiality is important to setting up a good relationship with the patient and family.
3. **Psychological support for the care givers/family**
   - Support the family, e.g. provide gloves or materials for dressings. Ask a home visitor to support the patient and/or the family at home.
   - Counsel family how to give the medical and psychological support to the patient
   - Encourage community members or neighbours, to help the main caregiver. This gives the caregiver time to rest.

Note: Palliative care may be a difficult subject for staff members. If you are upset try to talk with colleagues who have hadsimilar experiences. *Refer to the WHO palliative care booklet.*

23.1 REPRODUCTIVE TRACT INFECTIONS

DEFINITION
Diseases of the genital tract of men and women. Many are Sexually Transmitted Infections (STIs).

SIGNS AND SYMPTOMS
If you suspect a genital tract infection, you should:

- Do the genital examination in a **private room** and look for the following signs and symptoms: discharge, ulcers, warts, inflamed cervix and pain on palpation of cervix.
- Examine and **treat the patient's sexual partner for STI**

STI control is important to prevent sexual transmission of HIV. If you suspect STI, think about possible HIV co-infection and offer referral Voluntary Counselling and Testing (VCT). For non-pregnant patients, you may need to refer for VCT.

23.1.1. VAGINAL DISCHARGE SYNDROME

DEFINITION
If a patient complains of vaginal discharge, it is important to identify between:

1. **Vaginitis**: an infection of the vagina
   - Most common causes: *Gardnerella vaginalis* (**bacterial vaginosis**), *Trichomonas vaginalis* (**trichomoniasis**) and *Candida albicans* (**candidiasis**)
2. **Cervicitis**: an infection of the cervix
   - Most common causes: *Neisseria gonorrhoea* (**gonorrhoea**), *Chlamydia trachomatis* (**chlamydia**)

SIGNS AND SYMPTOMS

- Abnormal vaginal discharge
- Vulva itching/burning
- Painful intercourse
- Dysuria (pain when urinating)
- In candida vaginitis there can be vulva oedema, curd like discharge, erythema and scratch scars
- **Vaginitis**: usually no pain and no cervical discharge
- **Cervicitis**: red and swollen cervix with purulent discharge. More severe than vaginitis

DIAGNOSIS
If the tests for vaginitis and cervicitis are not available, make the diagnosis clinically.

RISK FACTORS FOR CERVICITIS

- Sexual partner has purulent urethral or vaginal discharge
- Sexual violence or prostitution
- New partner or the patient has more than one sexual partner in the last three months

****If the patient has at least one risk factor, you must treat as cervicitis****

TREATMENT OF VAGINITIS

Type of vaginal discharge	Responsible Micro-organism	Treatment
White, frothy discharge	Usually *Trichomonas* (protozoal infection)	**Metronidazole** (PO) 2g stat
Grey-green discharge and fishy smell	Usually *Gardnerella* (bacterial vaginosis = superficial bacterial infection)	**Metronidazole** (PO) 2g stat
White, itchy discharge	*Candida* (fungal Infection)	**Nystatin** 100,000 units OD inserted high in vagina x 14 days at bedtime.

1. Mixed infections (e.g. *Trichomonas*/ *Gardnerella* and *Candida*) can occur together. Treat both.
2. Advise the patient to return after 7 days for review.
3. If after 7 days she still has symptoms: Treat for cervicitis.

TREATMENT OF CERVICITIS

Treat the patient for cervicitis if:

- Any risk factors are present OR if the cervix is red and swollen with a lot of purulent discharge

Cervicitis treatment regime (give 2 drugs for 2 bacteria)

• *Gonorrhoea*	**Ceftriaxone** IM 500mg STAT (higher dose for resistance). If concerned about resistant gonorrhea ADD **azithromycin** 1g po STAT. AND
• *Chlamydia*	Non-pregnant: **Doxycycline** PO 100mg BID x 7 days Alternative: **Azithromycin** PO 1g po STAT, (*See obstetric guidelines* for treatment in pregnant women)

Note: In this region (South-East Asia), resistance against ceftriaxone has been reported. If a patient on ceftriaxone does not respond to treatment, consult a doctor for alternative drugs.

PREVENTION OF SEXUALLY TRANSMITTED INFECTIONS

Educate patients about STIs, promote/provide condom use, promote single partner sexual relationships.

23.1.2. PELVIC INFLAMMATORY DISEASE (PID)

DEFINITION

Infections above the cervix (endometritis, salpingitis, tubo-ovarian abscess, pelvic peritonitis) are mainly caused by *Gonorrhoea, Chlamydia* and anaerobic bacteria. PID is more severe than vaginitis/ cervicitis.

SIGNS AND SYMPTOMS

- Lower abdominal pain
- Sometimes fever
- Painful cervix/ adnexa on vaginal examination (sometimes painful mass palpable)
- Abnormally painful menstruation
- Pain during sexual intercourse (dyspareunia)
- Abnormal vaginal discharge
- Pain when passing urine (dysuria)

DIAGNOSIS

Clinical: **PID is highly likely if there is one of the above signs and symptoms and painful cervix or adnexa during vaginal examination or tender pelvic mass**. If available, microscopy of vaginal/cervical discharge may show gram-negative intracellular diplococci of gonorrhoea infection. *Chlamydia* cannot be identified by field microscopy and should always be treated if you treat for *Gonorrhoea*.

TREATMENT

You must treat for *Gonorrhoea, Chlamydia* and anaerobic bacteria; all three at the same time.

OPD Management (give 3 drugs for 3 bacteria)

1. Gonorrhoea	**Ceftriaxone** IM 500mg STAT AND
2. Chlamydia	Non-pregnant: **Doxycycline** PO 100mg BID x 14 days **Note**: **Azithromycin** 1g po STAT is not effective against PID (*See obstetric guidelines* for treatment in pregnant women) AND
3. Anaerobic bacteria	**Metronidazole** PO 500mg TID x 14 days

Criteria for hospitalisation in IPD

- Patient is pregnant
- Recent delivery / abortion
- Pelvic abscess is suspected
- Severe illness
- Patient can not follow complete OPD treatment
- Patient not better after 3 days of OPD treatment

IPD Treatment (give 3 drugs for 3 bacteria)

1. **Ceftriaxone** IM 500mg OD
2. **Doxycycline** PO 100mg BID
3. **Metronidazole** PO/IV 500mg TID

When the condition improves continue with:

Doxycycline PO 100mg BID
Metronidazole PO 500mg TID
for a total of 14 days (IV+PO)

Note: Refer if there is acute abdominal pain or PID symptoms are not better after 3 days of treatment.

If the diagnosis may be postpartum sepsis: Consider retained placenta and refer for manual placenta removal. (*see Obstetric Guidelines*)
Change antibiotics: **Ampicillin** AND **gentamicin** AND **metronidazole**

PREVENTION
Educate patients about STIs, promote/provide condom use, promote single partner sexual relationships.

23.1.3 GENITAL ULCERS AND WARTS IN WOMEN

DEFINITION
Genital ulcer : is a lesion on the surface of the mucosa or skin in the genital area.
Genital wart: is a raised portion of skin which can be flat on the top or elongated.
Both ulcers and warts are caused by sexually transmitted infections (STIs).

SIGNS AND SYMPTOMS
- Anal/ genital sores or ulcers
- For herpes primary infection: fever, painful vesicles on the genitals
- Swelling of inguinal lymph nodes
- Single or multiple warts in anal/genital area

DIAGNOSIS & TREATMENT
Diagnosis and treatment depend on the type of lesion (sore, ulcer, wart):

Figure 23.1 Diagnosis and treatment of genital lesions in women

Type of lesion	Treat for	First choice regime	Second choice regime
Genital ulcers (open sore or lesion)	Syphilis **AND** Chancroid	**Benzathine penicillin** IM 2.4 MIU STAT[1] **Note**: If the duration of infection is unknown, take it is as late syphilis (>2 years) and give one injection per week for 3 weeks PLUS **Ciprofloxacin** PO 500mg BID x 3 days (OR **Erythromycin** PO 500mg QID x 7 days OR **Azithromycin** PO 1g STAT)	**Procaine penicillin** IM 1.2 MIU OD x 10 days OR ***Doxycycline** PO 100mg BID x 14 days If pregnant: **erythromycin** PLUS **Ceftriaxone** IM 500mg stat
Genital ulcers[2] (small, painful blisters)	Herpes	Wash with soap and water Apply **gentian violet** x 5 days **Paracetamol** 1g QID x 5 days **Acyclovir** 200mg 5 times/day x 7 days (give within 5 days of first attack, but within 24hrs of symptoms if recurrent attack)	
Genital papule (separate, with dimple in centre)	Molluscum Contagiosum	Wash with soap and water Will disappear in about 8 weeks	
Genital warts (in groups, like cauliflower)	Condyloma Acuminata	Wash with soap and water **Paracetamol** PO 1g QID x 3 days External warts <3 cm: **Podophyllotoxin**[3] 0.5% solution – apply with cotton bud twice daily for 3 consecutive days/week up to 4 weeks Vaginal warts: Same as external wart <3cm but solution must be applied by medical person only External warts >3 cm and cervical, intraurethral, rectal or oral warts: May need surgical removal or cryotherapy	

* **Note**: Not in pregnancy: In pregnancy change doxycycline for erythromycin 500mg QID for 14 days.
[1] Because of the volume, this dose of benzathine penicillin is usually given as two injections at separate sites.
[2] Vaginal herpes may need oral acyclovir to prevent infection of child at birth. Active genital herpes at delivery or first episode of genital herpes in pregnancy should have a caesarean section. Refer to doctor.
[3] Podophyllotoxin is contraindicated in pregnant and breastfeeding women. Improper use may result in painful ulceration.

PREVENTION
Educate patients about STIs, promote/provide condom use, promote single partner sexual relationships.
Treat the patient and the partner.

23.1.3. SEXUALLY TRANSMITTED INFECTIONS IN MEN

DEFINITION

Sexually transmitted infections (STI) are diseases transmitted by sexual behaviour.

SIGNS AND SYMPTOMS

- Genital/ anal sore or ulcer
- For Herpes primary infection: fever, painful vesicles on the genitals
- Swollen inguinal lymph nodes
- Urethral discharge, dysuria are common in gonorrhoea
- Single or multiple warts in genital/anal area

DIAGNOSIS & TREATMENT

- Microscopy of urethral discharge may show gram-negative diplococci gonorrhoea infection. *Chlamydia* cannot be identified by field microscopy and should be treated presumptively.
- Treatment depends on the type of lesion (sore, ulcer, wart, lymph node swelling) and discharge:

Figure 23.3 Diagnosis and treatment of genital lesions in men

Type of lesion	Treat for	First choice regime	Second choice regime
Genital ulcers (open sores) on glans penis	Syphilis **AND** Chancroid	**Benzathine penicillin** IM 2.4 MIU stat[1] **Note**: If the duration of infection is unknown, take it is as late syphilis (>2 years) and give one injection per week for 3 weeks **PLUS** **Ciprofloxacin** PO 500mg BID x 3 days (OR **erythromycin** PO 500mg QID x 7 days OR **azithromycin** PO 1g stat)	**Procaine penicillin** IM 1.2 MIU OD x10 days (OR **doxycycline** PO 100mg BID x 14 days) **PLUS** **Ceftriaxone** IM 500mg stat
Penile or urethral discharge, pus, urethral irritation burning in passing urine	Gonorrhoea **AND** Chlamydia	**Ceftriaxone** IM 500mg stat (OR **azithromycin** PO 1g stat) **PLUS** **Doxycycline** PO 100mg BID x 7 days (OR **azithromycin** PO 1g stat)	 **Erythromycin** PO 500mg QID x 7 days
Inguinal swelling (**Lymphogranuloma Venereum**) painful bubo	Chlamydia	**Doxycycline** PO 100mg BID/ 200mg OD x 7days (OR **azithromycin** PO 1g stat)	
Genital ulcers (small, painful blisters)	Herpes	Wash with soap and water Apply **gentian violet** x 5 days **Paracetamol** 1g QID x 5 days **Acyclovir** 200mg 5 times/day x 7 days (give within 5 days of first attack, but within 24hrs of symptoms if recurrent attack)	
Genital papule (separate, with dimple in centre)	Molluscum Contagiosum	Wash with soap and water Will disappear in about 8 weeks	
Genital warts (in groups, like cauliflower)	Condyloma Acuminata	Wash with soap and water Paracetamol PO 1g QID x 3 days External warts <3 cm: **Podophyllotoxin** 0.5% solution – apply with cotton bud BID for 3 consecutive days/week up to 4 weeks External warts >3 cm and intraurethral, rectal or oral warts: May need surgical removal or cryotherapy	

[1] Because of the volume, this dose of benzathine penicillin is usually given as two injections at separate sites.

PREVENTION

Educate patients about STIs, promote/provide condom use, encourage less or single partner sexual relationships.

Treat the patient and the partner.

23.1.4. REPRODUCTIVE TRACT PROBLEMS IN PAEDIATRICS*NEW

A ***genital examination*** is important when the patient or family complains of a problem in the genital area.

- If you are not comfortable doing the examination, ask another medic or doctor for help.
- Before any genital examination, counsel the patient (when applicable) that they are IN CONTROL and WILL NOT BE HURT. The **CAREGIVER MUST BE PRESENT** during the examination.
- If the child is afraid, they can be examined on the caregiver's lap.
- Explain to the child to tell you if there is pain, so you can be gentler during the examination. Look for rash and signs of infection, discharge, trauma, or scar tissue.
- Look at the rectal area for lesions, lacerations, and scarring. You should also notice if there are both new and old lesions or scars.

VAGINAL BLEEDING

- May occur in female newborns because of decreasing hormone levels (from the mother) after delivery. This is normal (like a menstruation) and you can reassure the mother that the female infant has a normal reproductive system. If bleeing is >2-3 days, consider another diagnosis.
- Vaginal bleeding in an infant or prepubertal child is NOT normal. Ask about trauma (e.g. haematoma from straddle injury) and sexual abuse.

If sexual abuse is suspected, immediately *refer to the Gender Based Violence (GBV) guideline p.93,*
BEFORE
continuing with the patient/family interview or examination.

- In prepubertal children, the unestogenised labia are small so the vagina and the vaginal opening are easily contaminated with stool and other materials. This can cause vulvovaginitis. There may be pain, redness, itching, or dysuria). The most common cause of **vulvovaginitis** are poor hygiene, irritation from soaps, and bacterial infection. Counsel the patient and family about proper hygiene. Wash the genital area daily, use only water to wash the genitalia, and avoid tight synthetic clothing (should wear plain cotton underclothes). If you see **vaginitis with discharge on examination**, think about STI.

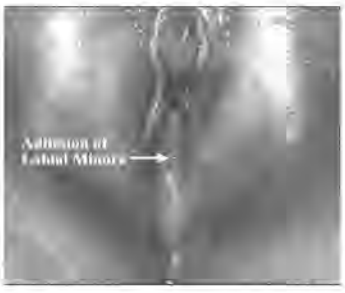
VAGINAL TAGS

- Usually noticed during infancy
- They look the same as skin tags except they are located on the mucosal surface of the vagina
- On physical examination, this can be seen easily with only a visual exam. A vaginal skin tag is normal

LABIAL ADHESIONS

- When the labia minora are fused together and you cannot see the urethra and vaginal opening.
- **This is normal.**
- If you are able to see the urethra, there might be a different diagnosis (discuss with the doctor).
- Do not make incisions or insert anything inside to make an opening. This could cause trauma and scar tissue.
- Observe until puberty. The labia may open spontaneously as the child becomes more active. Increased female. hormones during puberty will make the labia open naturally.
- Can be treated with oestrogen cream applied to the fused line BD, but the adhesions may come back.

Figure 23.3 Labial adhesion



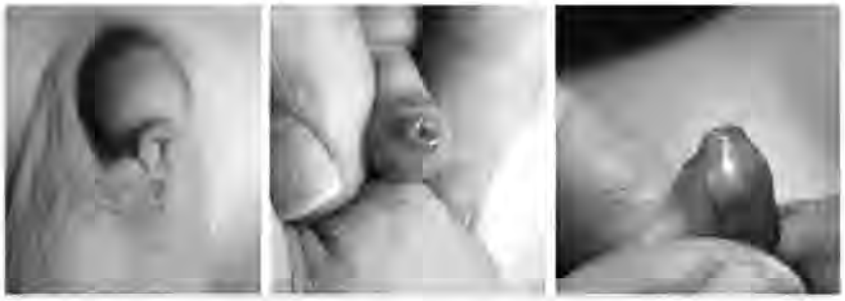
HYDROCELE OR INGUINAL HERNIA

- Common problem in male children.
- A **hydrocele** is when fluid collects inside the scrotum around the testis.
- Occurs because of an opening between the scrotum and abdominal wall (so the intra-abdominal fluid enters the scrotum).
- **Inguinal hernias** occur when there is an opening in the muscle and tissue of the abdominal wall. The intestines push out of the opening when crying or lifting heavy things. For both hydrocele and inguinal hernia observe the patient until 2 years old. Over 60% will improve without treatment. Prematurity is a risk factor for hernias. If the hydrocele or hernia is very large, refer for surgery.

PHIMOSIS

- In young males who are not circumcised, the foreskin of the penis may remain slightly closed. This means that the foreskin cannot be pulled back easily over the head of the penis.
- **This is normal**.
- Do not insert a foreign body to make the opening bigger. This can cause trauma and tissue contractures which will result in permanent phimosis.
- Observe until puberty.
- The increased male hormones during puberty will make the foreskin open naturally. Treatment for phimosis is circumcision.

Figure 23.4 Phimosis



BALANITIS

- Swelling of the foreskin
- Caused by:
    - Chemical irritation
    - Fungal infection (e.g. candida)
    - Tinea infection
    - Bacterial infection
    - STI
    - Poor hygiene
- Treatment:
    - Hygiene is the most important treatment.
    - Clean or soak the penis in a weak salt solution BID to TID.
    - Use a cotton swab to clean inside (between the foreskin and penis glans).
    - Treat the underlying cause.
    - If there is urinary obstruction from the inflammation or pain, consider urinary catheterisation. Consult a doctor if needed.Patients with severe balanitis and urinary obstruction may need referral for surgery.

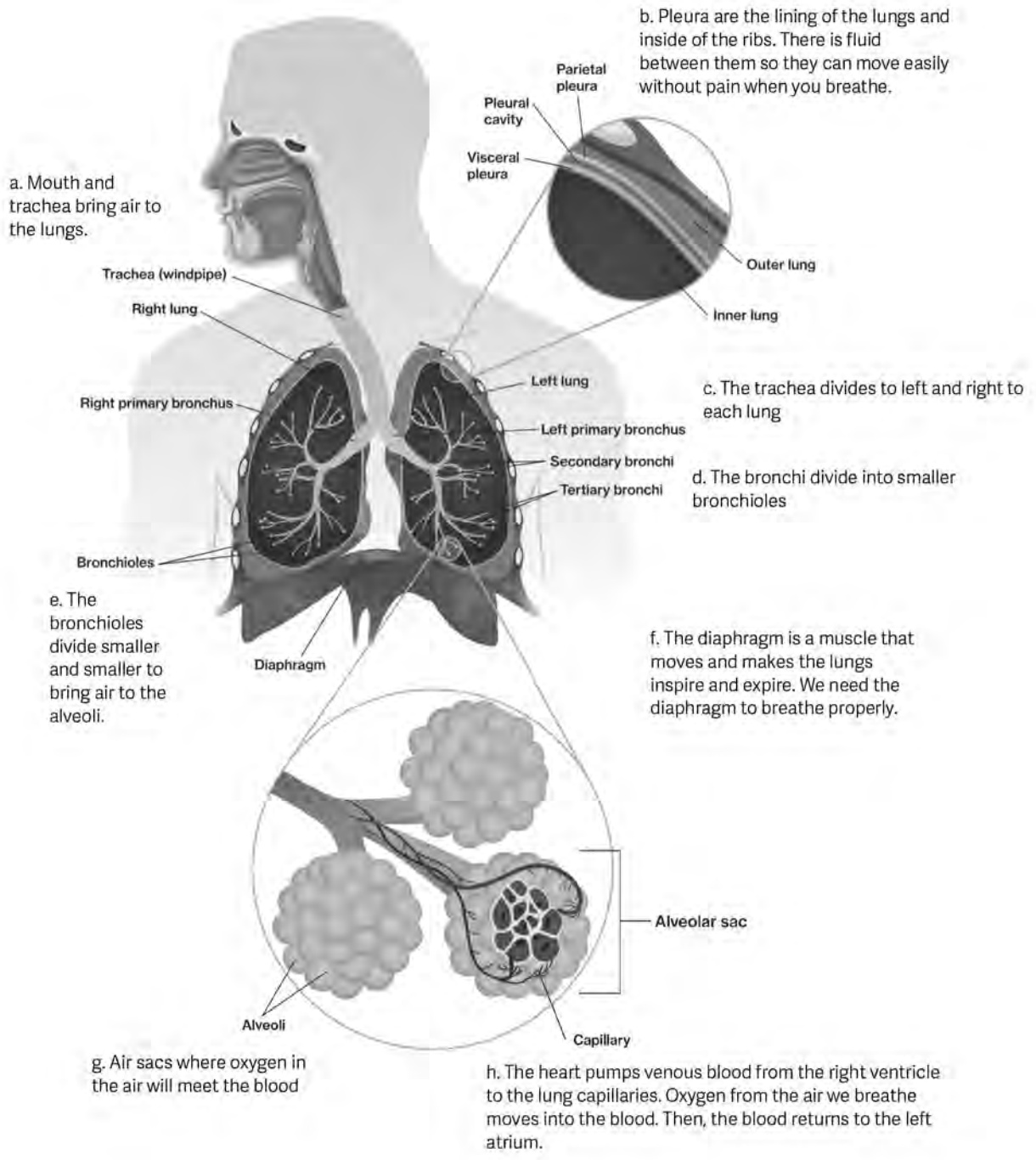
24.1 CHEST EXAMINATION

On listening (auscultation) to the chest, you may hear some examples of abnormal breath sounds. **Breath sounds must be compared between the left and right lung**, and the different lobes of each lung.

Quantity: Breath sounds may be reduced or absent over areas of the lung where less air is entering because of disease.

Quality: Normal breath sounds are 'vesicular' in the lungs and 'bronchial' over the trachea [a] and main bronchi [c]. Bronchial breath sounds heard in the lungs are a sign of pneumonia. *See Figure 24.1*

Figure 24.1 Lung anatomy



The most common abnormal sounds heard are:(*See Figure 24.1*)

1. **Crepitation**: are crackles made when air enters the alveoli [g] and small bronchi [d] and makes them open. **Crepitations** are also the sound of air bubbling through mucus or fluid in the alveoli [g]. If crepitations disappear after coughing, they are probably not significant.

2. **Wheeze**: is a whistling sound caused by air passing through narrowed airways [d and e]. **Wheeze** can be caused by asthma, chronic obstructive pulmonary disease (COPD) and sometimes pulmonary oedema. It can be associated with infection, especially in children <2yrs (bronchiolitis [e]). If wheezing is heard only in one small area of the lung, and it does not disappear after coughing, it may be caused by a tumour or foreign body causing partial obstruction of a bronchus [c]. **Stridor** is a sound that comes from the vocal cord area (glottis and epiglottis).

3. **Pleural Rub**: is a creaking sound usually heard in one area during inspiration and expiration. It is caused the two pleural surfaces [b] moving over each other when the surfaces are rough because of inflammation (e.g. pleurisy caused by pneumonia, TB).

24.2 ACUTE RESPIRATORY INFECTIONS

Acute respiratory infections (ARI) can be divided into:

- Upper Respiratory Tract Infections (URTIs): ear, nose, throat, tonsils, sinuses
- Lower Respiratory Tract Infections (LRTIs): lungs

24.2.1. UPPER RESPIRATORY TRACT INFECTIONS

(*For Ear Diseases see p.57*)

DEFINITION

Upper Respiratory Tract Infections (URTIs): infections of the upper airways which include the ear, nose, throat, tonsils or sinuses. Most of these infections are caused by viruses (antibiotics cannot treat) and last for a short time. The lungs are not affected. If the symptoms are severe and/or last for more than a week, this may be a sign of a more severe bacterial infection or influenza.

COMMON COLD

DEFINITION

Common cold is a mild URTI caused by a virus. It is very common and not dangerous. It can be an early sign of another infection (e.g. measles or influenza) or complicated by a bacterial infection (e.g. otitis media or sinusitis). In any community, a lot of people will have a cold at the same time.

SYMPTOMS

- Nasal discharge or block, sore throat, cough, mild or no fever, lacrimation (tears in the eyes)
- In children <5 years, always check the tympanic membranes for otitis media

TREATMENT

- Paracetamol 3 days and advise when to come back to clinic
- Treat symptoms with medications for cough and cold. Patients can find them in any pharmacy
- Avoid medications for cough and cold if <2 years old because of side effects. **No antibiotics needed**

SINUSITIS

DEFINITION

Acute sinusitis is an infection of the sinuses with pus discharge from nose or around teeth. This may develop into chronic sinusitis. Most acute sinus infections are viral and resolve spontaneously within 10 days. Acute bacterial sinusitis may be a primary infection, a complication of viral sinusitis or of dental origin. Especially in children, bacterial sinusitis can spread to the bone, eye or meninges (causing meningitis) so it is important to treat.

SYMPTOMS

- Unilateral or bilateral discharge, nasal obstruction AND
- Facial unilateral or bilateral pain that increases when bending over, painful pressure either side of nose or behind forehead
- Usually no fever or mild fever

Sinusitis is likely if symptoms:

- Continue for more than 10-14 days AND/OR
- Worsen after 5-7 days AND/OR
- Are severe (severe pain, high fever, deterioration of general condition)

TREATMENT

- **Paracetamol** and NSS drop
- **Amoxicillin** Adult: 500mg TID, can increase up to 1 g TID for severe infection
  Child: 15 mg/kg TID, can increase up to 30 mg/kg TID (if needed) for 7-10 days
- If no response within 48 hours consider changing to **co-amoxiclav** PO for 7 to 10 days
  Use the amoxicillin (not the clavulanate) to calculate the dose:
  Children < 40 kg: 25 mg/kg 2 times daily
  Children ≥ 40 kg and adults:
  Ratio 8:1: 2000 mg daily (2 tablets of 500/62.5 mg 2 times daily)
  Ratio 7:1: 1750 mg daily (1 tablet of 875/125 mg 2 times daily)

PHARYNGITIS

For photo, *see Appendix 1*

DEFINITION

Inflammation of the pharynx (throat), it is very common.

SYMPTOMS

- Sometimes a sore throat is the only symptom. It may also be painful to swallow
- The throat may be red with or without whitish exudate. Fever may or may not be present
- In patients over 14 years, the probability of bacterial pharyngitis is low
- Symptoms typically get worse over 2 to 3 days and then gradually go, usually within a week

If there is a grey membrane on the back of the throat, suspect diphtheria

TREATMENT

- Analgesia (pain treatment) e.g. **paracetamol**
- No antibiotics

Infectious mononucleosis caused by Epstein Barr Virus (EBV) is found in adolescence and young adults. Symptoms are fever, extreme fatigue, pharyngitis, cervical lymphadenopathy, and often splenomegaly. Atypical lymphocytes in the blood are increased on the peripheral smear.

TONSILLITIS

For photo, *see Appendix 1*

DEFINITION

Tonsillitis is an infection of the tonsils at the back of the mouth, which is most commonly due to a bacterial or viral infection.

SYMPTOMS

- Similar to pharyngitis but more severe, in particular, fever and generally feeling unwell tend to be worse than pharyngitis symptoms
- Sore throat is worse on swallowing or turning the head
- Swollen neck glands are common
- Pus may appear as white spots onthe tonsils
- Most cases of viral tonsillitis improve after 3 to 4 days

The following symptoms make bacterial tonsillitis more common:

1. Absence of cough
2. Fever >38°C
3. At least one enlarged and painful anterior cervical lymph node
4. Presence of pus on tonsils

COMPLICATIONS

- **Peritonsillar abscess**
  - SYMPTOMS: fever, intense pain, hoarse voice, trismus (cannot open mouth fully), tonsillar swelling on one side which moves uvula to one side
  - TREATMENT: need surgical drainage as well as antibiotics for tonsillitis
- **Rheumatic fever**
- **Acute glomerulonephritis**

TREATMENT

Treatment with antibiotics if suspect bacterial cause, can help prevent complications. Treat the fever and advise the patient to drink plenty of fluids. **Note**: shorter courses of penicillin V do not prevent Rheumatic Fever, must finish 10 days treatment.

If the patient can take PO tablets and can eat and drink:

	Penicillin V PO	OR	**Benzathine penicillin** IM
Adult:	500mg QID x 10 days		1.2 million IU STAT
Child:	15mg/kg QID x 10 days		25,000-50,000 IU/kg (max 1.2 million IU) STAT

If allergic to penicillin:

	Erythromycin* PO	OR	**Azithromycin** PO
Adult:	500mg PO x 5 days		500mg PO x 3 days
Child:	8 - 18 yrs: 250 - 500mg QID 2 - 8 yrs: 250mg QID 1m - 2 yrs: 125mg QID *Severe infection: double the dose		20mg/kg (max 500mg) OD 20mg/kg (max 500mg) OD 20mg/kg (max 500mg) OD

If the patient cannot take oral treatment, admit to IPD and give IV fluids and treat with antibiotics as follows:

Adult: **Benzathine penicillin** IM 1.2 million IU STAT OR
Benzyl penicillin IV 1.2g QID OR
Ampicillin IV 1g QID

Child: **Benzathine penicillin** IM 50,000 IU/kg STAT (max 1.2 million IU) OR
Benzyl penicillin IV 25mg/kg QID OR
Ampicillin IV (*see MTC Medication Handbook*)

Change to **penicillin V** PO when the patient can take oral treatment. Treat for a total of 10 days.

Note: if rash develops think of Epstein Barr Virus (EBV). The virus reacts with ampicillin to cause a rash.

DIPTHERIA *NEW

DEFINITION

Diphtheria is an infectious disease caused by the bacteria Corynebacterium diphtheriae. It spreads from person to person by respiratory droplets from the throat through coughing and sneezing. The diphtheria bacteria produce toxins throughout the body.

SYMPTOMS

- Tonsillitis with grey sticky membranes in the throat
- High fever >39°C
- Oliguria, cervical oedema, enlarged cervical lymph nodes
- Signs of haemorrhage e.g. purpuric rash, epistaxis, bleeding gums

URGENT REPORT
see Appendix 7

COMPLICATIONS

- Myocarditis
- Neuropathies
- Renal failure
- Pneumonia

For photo, *see Appendix 1*

TREATMENT

1. **Isolate patient. Refer quickly if possible, especially for laryngeal obstruction (needs urgent intubation), cardiac or neurologic complications**
2. Nose and throat samples for culture if available
3. If strong suspicion start antibiotic treatment:

Adult: **Benzathine penicillin** IM 1.2 million IU STAT OR
Benzyl penicillin IV 2.4g QID x 7 days

Child: **Benzathine penicillin** IM 50,000 IU/kg (max 1.2 million IU) STAT OR
Benzyl penicillin IV 50mg/kg QID x 7 days

If allergic to penicillin:
Adult: **Erythromycin** PO 500mg QID
Child: same dose as for tonsillitis x 7days (*see previous section*)

4. Give antitoxin serum (see below)
Antitoxin serum should be given with caution, because of common allergic reactions:
a. Give 0.1ml SC
b. Wait 15 min. If no allergic reaction or erythema around the injection site give 0.25ml SC
c. Observe for further 15 min before injecting the rest IM or IV
d. Same dose for adults and children
e. Give IV if more than 20,000 units in 200ml NSS over 4 hours:

Laryngitis or **pharyngitis**	20,000 - 40,000 units
Rhinopharyngitis (inflammation of nasopharynx)	40,000 - 60,000 units
Serious form or >48hours after onset of symptoms	80,000 - 100,000 units

****After infection you are not immune. Update the vaccination after recovery.****

PREVENTION
- Routine vaccination and mass vaccination in an epidemic
- Treat close contacts (e.g. family members, children in the same class at school, health providers)
  - **Benzathine penicillin** (single dose IM) or **erythromycin** (7 days PO) (*see treatment dosing*)
  - If possible, quarantine, daily monitoring (throat exam and temperature) for 7 days and no school or work until 48 hours after finishing antibiotics
- Check **vaccination** status:
  - If less than 3 vaccines: complete course
  - If received 3 injections and last injection >1 year before: give a booster dose
  - Health providers in direct contact with patients: give a booster dose

*CROUP**UPDATE

DEFINITION
Viral infection causing swelling around the vocal cords in children.

SIGNS AND SYMPTOMS
- Acute onset of barking cough, hoarseness of voice
- Stridor (inspiratory wheeze or noise)
- Croup is considered mild or moderate if the stridor only occurs with agitation
- Croup is considered severe if there is stridor at rest, especially when it is accompanied by respiratory distress (intercostal, subcostal or sternal recession, decreased air entry and altered level of consciousness)
- Wheezing may be present
- Has recent mild upper respiratory tract infection

Figure 24.2 Tripod position
(patient tries to keep the airway open)

DIAGNOSIS AND TREATMENT
This is a clinical diagnosis

*ACUTE EPIGLOTTITIS**UPDATE

DEFINITION
A severe bacterial infection of the epiglottis seen in children.

SIGNS AND SYMPTOMS
- Sudden onset of symptoms
- Sore throat
- High fever
- Stridor
- No vaccination
- 'Tripod' position

****DANGER SIGNS****
Rapidly becoming severe, drooling, 'tripod' position.
This is an emergency! Do not examine the child unless you are able to intubate.
If the child cries, the airway can become obstructed.

DIAGNOSIS AND TREATMENT

The diagnosis is clinical

For treatment *see Figure 24.4*

Figure 24.3 Management and treatment of stridor in children*new

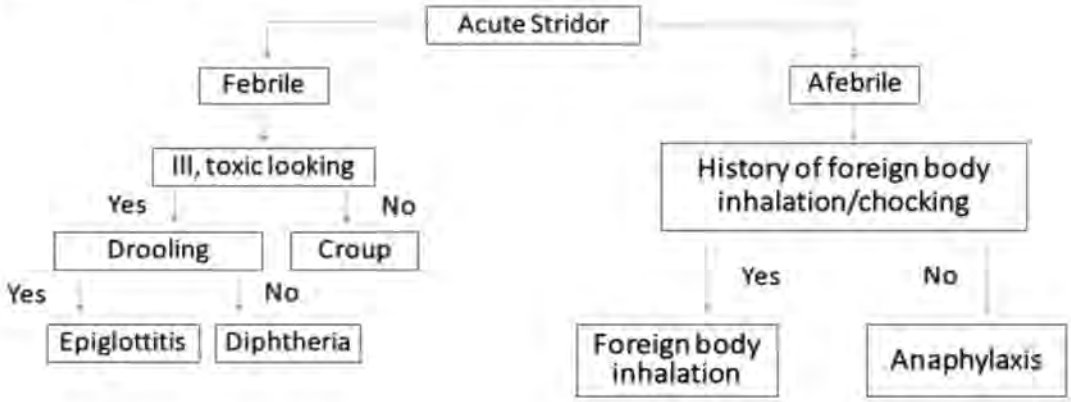


Figure 24.4 Management and treatment of stridor in children*new

Stridor Treatment Protocol

Stridor

Definition: harsh breathing noise produced by obstruction to breathing in the larynx or trachea, mainly on breathing in (inspiration). It is one of the features of upper airway obstruction with hoarseness and barking cough

Leave the child in a comfortable position
DO NOT distress the child

Croup

Symptoms
Coryzal onset
No drooling
Barking cough
Able to drink
Harsh stridor
Hoarse voice

Treatment
Moderate respiratory distress – **Prednisolone** 2mg/kg (max 40mg)
Severe respiratory distress – **Prednisolone** and nebulised **adrenaline**

Epiglottitis

Symptoms
Rapid onset
Toxic appearance
Drooling
Temp >38.5°c

Treatment
Emergency transfer
Prednisolone 2mg/kg (max 40mg)
5ml **adrenaline** nebulised
Ceftriaxone 50mg/kg IM or IV
If cannot transfer
Adrenaline nebulizer PRN
Ceftriaxone 10 days (can change to augmentin when afebrile and well)

Foreign body inhalation

Symptoms
Choking
Sudden onset

Treatment
Choking Child Protocol
Prepare for transfer

Anaphylaxis

Symptoms
Skin rash (urticaria), Itching, Oedema, Wheezing

Treatment
Adrenaline IM
0.05ml <6months
0.12ml 6 months – 5 years
0.25ml 6 years – 11 years
0.5ml 12 years+
Hydrocortisone IV
25mg TID <1year
50mg TID 1yr – 5 years
100mg TID 6 years – 11 years
250mg TID 12 years+
If wheeze 5mg nebulised **salbutamol**
Chlorpheniramine PO
2.5mg QID <1year
5mg QID 1yr – 5 years
10mg QID 6 years – 11 years
20mg QID 12 years+

PERTUSSIS

SURVEILLENCE
see Appendix 7

DEFINITION
Pertussis is also known as whooping cough, is a highly contagious disease that is caused by the bacterium *Bordetella pertussis*. It is transmitted through inhalation of droplets spread by infected individuals e.g. coughing, sneezing. Pneumonia can be a complication.

SYMPTOMS
- Most cases are in non-vaccinated or incompletely vaccinated individuals.
- Initially mild ARI symptoms.
- After 1-2 wks, coughing is followed by an inspiratory 'whooping' sound mostly at night, and vomiting after severe coughing.
- Fever is often absent or not too high, and the exam may be normal between coughing episodes.
- After weeks or months the symptoms gradually resolve.

TREATMENT
- Admit infants <3 months (observe 24 hours because risk of apnoea)
- Admit severe cases
- Try to isolate patients (airborne isolation) until >5 days of antibiotic treatment.
- Hydration and nutrition: Drink and eat (or breastfeed) frequently in small quantities after coughing episode. Monitor the weight and consider food supplements.
- Antibiotics: give in first 3 weeks after onset of cough

First line:	**Azithromycin** PO	Adult: D1 500mg STAT, D2-D5 250mg OD Child: 10mg/kg OD (max 500mg) x 5 days
Second line:	**Erythromycin** PO	Adult: 500mg QID x 7 days Child: dose as for tonsillitis x 7days, *see p.234*

PREVENTION
- Isolate patients in IPD and OPD so they cannot spread the infection to others.
- Pertussis vaccine can prevent severe disease in young children.
- Antibiotic prophylaxis (**azithromycin** same dose as treatment for 5 days) for unvaccinated/ incompletely vaccinated infants <6m who have had contact with suspected case. **Isolation of contacts is NOT necessary.**

INFLUENZA

DEFINITION
Influenza is a viral infection that can be very contagious. Often there is close contact with someone who has similar symptoms. Different strains of influenza occur such as the avian influenza (H5N1). Common influenza is self-resolving, but some dangerous strains can become pandemics (epidemic that spreads across countries) and have high morbidity and mortality.

SIGNS AND SYMPTOMS
- Fever, muscle pain, headache
- Respiratory symptoms (cough, sore throat and runny nose)
- Diarrhoea
- Shortness of breath (dyspnoea)
- Clinical pneumonia

DIAGNOSIS
Clinical diagnosis initially, nasopharyngeal sample can help confirm.

TREATMENT
- **Paracetamol** for fever and pain
- Antibiotics not required
- Encourage sufficient oral hydration

PREVENTION
- **Infection prevention**: the patient should wear a mask and should cover his/her mouth with a cloth while coughing or sneezing and wash their hands afterwards.
- Hand hygiene
- Isolate patients in IPD and OPD so they cannot spread the infection to others.

24.2.2. LOWER RESPIRATRY TRACT INFECTIONS*UPDATE

*BRONCHIOLITIS*UPDATE*

DEFINITION

A viral infection of the tiny airways, called the bronchioles, especially in children less than 2 years of age.

SIGNS AND SYMPTOMS

- Fever (usually low grade)
- Increased RR or difficult breathing
- Cough and coryza
- Prolonged expiration phase, wheeze and/or crepitation throughout the lungs (not focal)

DIAGNOSIS

- Diagnosis is usually clinical
- Chest X-ray: peri bronchial thickening, hyperinflation or flat diaphragms
- WBC and CRP usually is normal (can help differentiate bronchiolitis from bronchopneumonia)

TREATMENT

1. Salbutamol or adrenaline inhalation or nebulizer. Use the treatment that the patient responds better to.
2. No antibiotics unless the clinical condition becomes worse or investigations are abnormal.
3. If the patient is on oxygen and difficult to wean or if there have been many episodes of bronchiolitis, you can try using prednisolone 1 mg/kg/day for 3-5 days.
4. *See Figure 24.5*

PREVENTION

Counsel the family to keep the child away from smoke (e.g. cigarettes, cheroot, cooking fire or when burning the fields for farming.

Figure 24.5 Management of bronchiolitis in children < 1 year*new

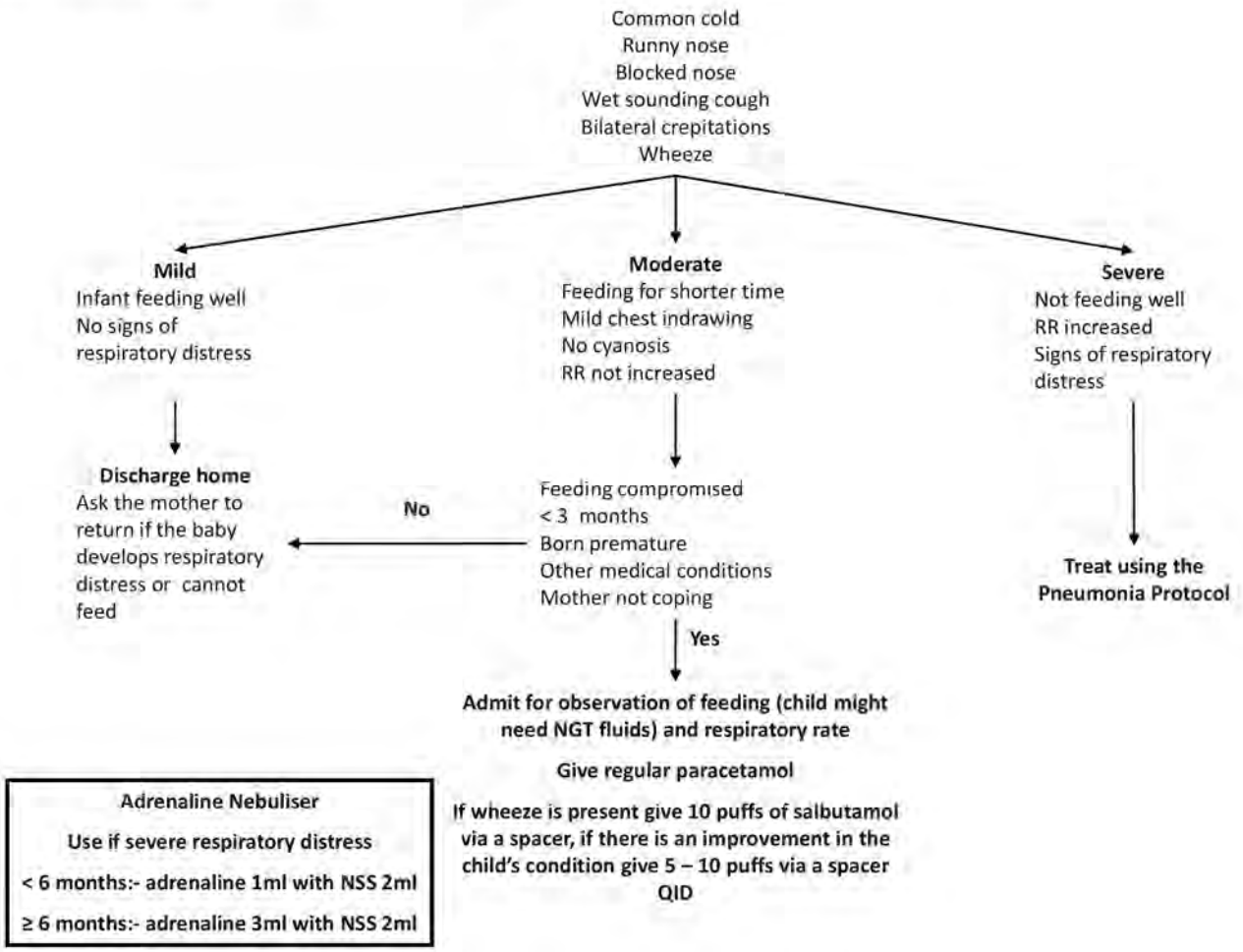
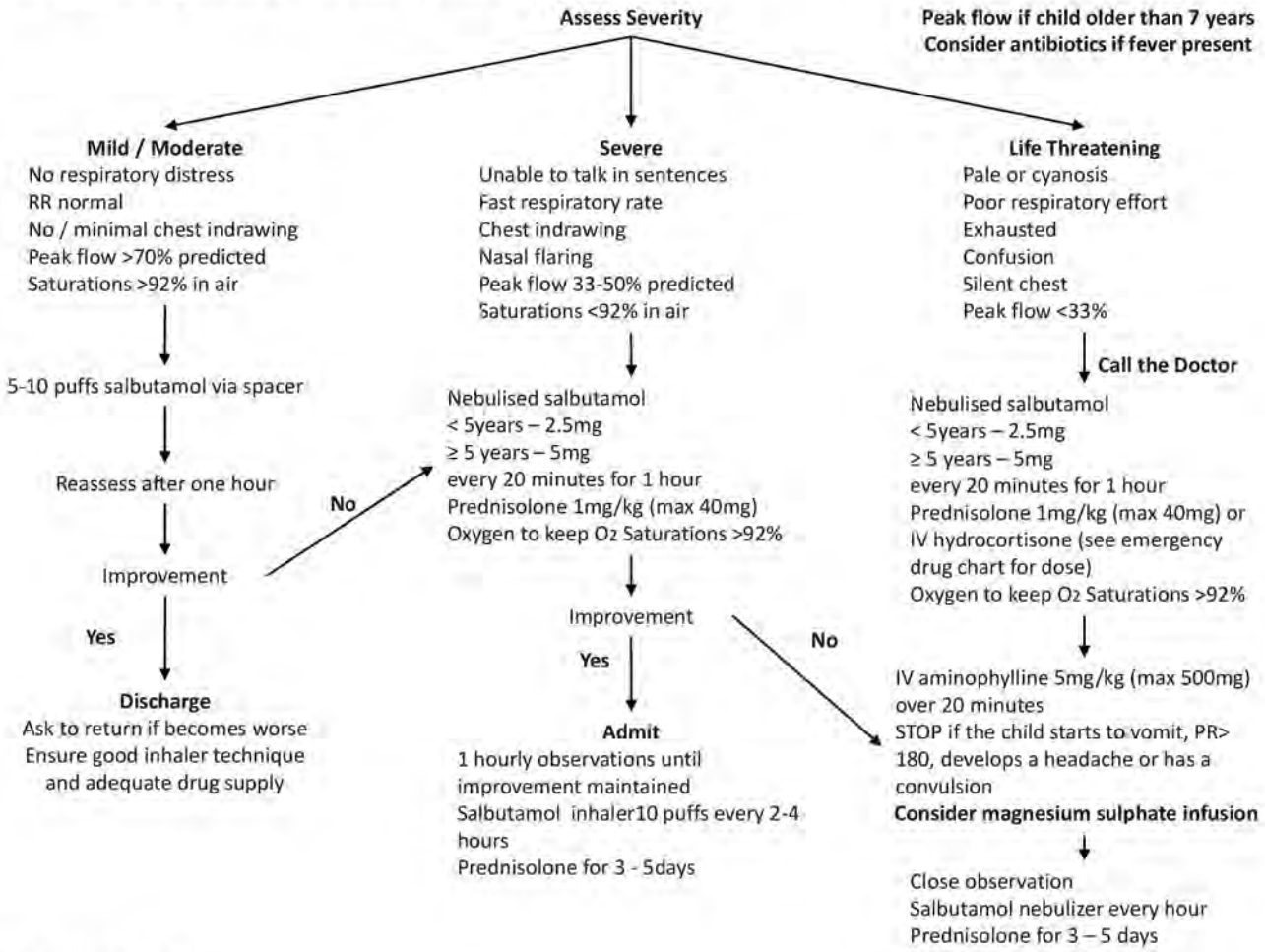


Figure 24.6 Management of wheeze in children ≥1 year*new



*PNEUMONIA*UPDATE*

DEFINITION

Pneumonia is an infection affecting the lungs and smaller airways. These can be viral, bacterial, parasitic or fungal infections. For children, *see Paediatric pneumonia protocol, Figure 24.7.*

SIGNS AND SYMPTOMS

SYMPTOMS:
- Cough, sputum: yellow or green (may have blood)
- Dyspnoea, fast breathing
- Chest pain (with cough and deep breaths)

SIGNS:
- Inspection: cyanosis, nasal flaring, chest indrawing, superficial or asymmetric breathing
- Percussion: dullness
- Auscultation: abnormal breath sounds

In addition, patients with pneumonia may have general signs and symptoms of infection:
- Fever, rigors
- Generally unwell, tired
- Tachycardia
- Dehydration, low blood pressure

Signs of severity in adults	
Rapid breathing	(RR >30/min)
Cyanosis	(blue colour of lips or nails, CRT > 2 seconds)
Reduced consciousness or confusion	Especially in elderly
Low blood pressure	(SBP <90mmHg or DBP <60mmHg)
High pulse rate	(>120 beats/minute)
Low SpO2	(<94%)
Chest indrawing or nasal flaring	

DIAGNOSIS

To diagnose an adult with pneumonia they must have:

- Fever AND
- Cough AND
- Abnormal chest sounds
- Chest X-ray can confirm a pneumonia if diagnosis is not clear e.g. not responded to antibiotics

Think about Beriberi if there is sudden fast breathing and no or low-grade fever.
After birth, beri beri most commonly presents around **4 months old.**

RISK FACTORS

- Aged 65 years or more
- Malnutrition
- Severe anaemia
- Heart failure
- Measles
- Splenectomy
- Sickle cell disease (not seen here)
- Immunocompromised e.g. HIV with CD4 <200

If a young adult patient has **one or more signs OF SEVERITY** treat as **SEVERE pneumonia.**
If from the '**patient at risk group**' treat case by case – likely need to treat as severe pneumonia.

TREATMENT

Treatment is different depending on:

1. The presence of signs of severe illness (*see signs and symptoms*)
2. If the patient is from the 'at risk group'

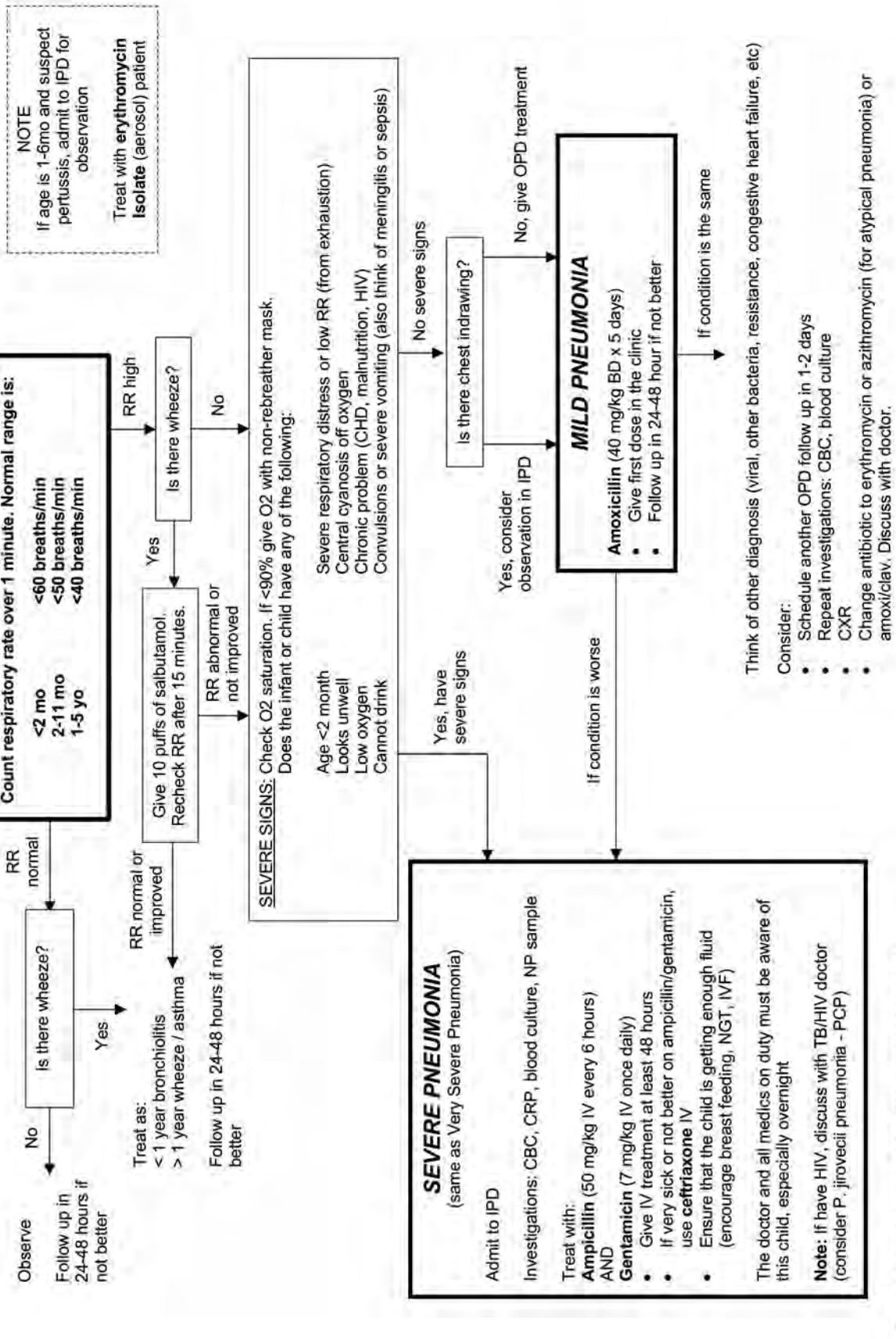
MILD PNEUMONIA = no signs of severe pneumonia

- Adults: **Amoxicillin** PO Adult: 500mg TID x 5-7 days
- Child: **Amoxicillin** 40mg/kg BID x 5 days (*see Paediatric pneumonia protocol, Figure 24.7*)
- Paracetamol for fever, increase oral fluid intake
- Follow-up in 24 to 48 hours or sooner if the child's condition deteriorates:
    - If the condition is improving continue with the same antibiotic to complete treatment.
    - If there is no improvement after 3 days of correct administration: change antibiotic to **erythromycin** or **azithromycin** (for atypical pneumonia) or **co-amoxicillin/clavulanate**
    - If the condition is worse: hospitalise and treat as severe pneumonia

SEVERE PNEUMONIA = signs of severe pneumonia

- Adults: *see the POST EMERGENCY TREATMENT section below* for IV antibiotics
    - If have risk factors, discuss with doctor.
    - You can try oral antibiotics first but observe closely
- Children: **Ampicillin** IV 50mg/kg QID and **Gentamicin** IV 7mg/kg daily until no fever x 48 hours; change to **Amoxicillin** 40mg/kg BID to total 7 days of antibiotics (*see Paediatric pneumonia protocol, Figure 24.7*)

Figure 24.7 Management of pneumonia in infants and children >2mo - <5yr*new



EMERGENCY TREATMENT

Note: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step*

Figure 24.8 DRS ABCDE chart for pneumonia

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **SEVERE PNEUMONIA**
DRS	Danger Response Send for help	Gloves Safe place Dall for help
A	Airway obstruction Speaking, stridor, swelling, secretions	**Oxygen** (maintain SpO2 >94%)
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	**Nebulisers** if have wheeze If dyspnoea **sit up right**
C	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in **IV cannula** – take bloods e.g. Hct, CBC, MS, BC, dextrose etc. If signs of shock give fluid bolus **NSS** 500ml
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	**Ampicillin** IV Adult: 1g; Child 50mg/kg +/- **additional antibiotic** (*see below*) Consider **ceftriaxone** IV if condition is severe. **Paracetamol** 1g Give dextrose if low
E	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

POST-EMERGENCY TREATMENT

- Admit to IPD, treat the fever, keep the patient in a sitting position.
- Give maintenance IV fluids if patient cannot eat or drink
- Give oxygen if needed. Keep SpO2 >94%, wean oxygen when improved, *see Appendix 19*
- Give vitamin A treatment dose to all children < 12 years.

- Antibiotics for adults: (If pregnant refer to Obstetric Guideline)
  - **Ampicillin** IV 1g TID
  - You may need to give **Additional Antibiotic Treatment** (*see below*)
  - If have risk factors, consider using **Ceftriaxone** IV 1g OD
  - Change to PO **amoxicillin** 500mg TID when condition improved (total 7 days of antibiotics)

- Antibiotics for children (*see Paediatric pneumonia protocol Figure 24.7 above*):
  - **Ampicillin** IV 15mg/kg QID AND
  - **Gentamicin** IV 7mg/kg OD
  - Use IV treatment at least 48 hrs. After no fever for 48 hrs change to **amoxicillin** 15mg/kg TID to finish total 7 days of antibiotics.
- Check temperature, PR and RRregularly to see if the patient is getting better or worse.

- Antibiotics for immunocompromised patients: (*If pregnant see PMTCT guidelines, Appendix 20*)

- **Additional Antibiotic/Treatment:**
  - This may be needed if:
    - Patient is very unwell
    - Poor response to ampicillin/ amoxicillin
    - Recurrent episodes of pneumonia

Additional antibiotics/treatments may be needed for these problems:

1. **Atypical Pneumonia**: pneumonia caused by bacteria e.g. Legionella, Mycoplasma, will not respond to routine antibiotics. Patients should be treated with **doxycycline**, **erythromycin**, or **azithromycin**. Consider adding ciprofloxacin also.
2. **Staph Aureus Pneumonia**: particularly if skin infection, patient looks very unwell, CXR shows necrotizing lesions. Treat with IV cloxacillin.
3. **Tuberculosis**: If there has been good compliance of amoxicillin and an antibiotic to cover an atypical pneumonia, suspect TB (symptoms include coughing for more than 2-3 weeks, weight loss, coughing with blood and/or night sweats) ***Do NOT use ciprofloxacin if suspect TB.***
4. **Aspiration pneumonia**: Patients with decreased consciousness, or those that have problems swallowing e.g. after a stroke, have high risk of aspiration pneumonia (inhaling acid or vomit from the stomach). To prevent keep comatose patients in the coma position (see p.19). If suspect an aspiration pneumonia e.g. a comatose patient develops signs of ARI **treat as per pneumonia + metronidazole**.
5. **Fungal pneumonia**: is uncommon, but it may occur in patients with immune system problems due to AIDS, immunosuppressive drugs, or other medical problems. *See HIV chapter.*
6. **Eosinophilic pneumonia**: is invasion of the lung by eosinophils, a particular kind of white blood cell. Eosinophilic pneumonia often occurs in response to infection with a parasite (e.g. paragonimus, intestinal worms, lymphatic filariasis or as inflammatory or allergic reactions (including asthma). Treat the underlying cause.

PREVENTION AND VACCINATION

For patients without a spleen, **amoxicillin** should be given at the first sign of ARI. These patients should also receive pneumococcal vaccination. **Co-trimoxazole** should be given to those with HIV and low CD4 count.

PARAGONIMUS

DEFINITION

Paragonimus is a 'fluke' (short flat worm) that mainly affects the lungs. It is caused by eating infected, under-cooked, fresh water crabs and crayfish.

SYMPTOMS

2 most common symptoms are:
Productive cough >2 weeks
Intermittent **haemoptysis** (rusty-brown colour)

Signs and symptoms are very like pulmonary TB and include:

- Cough with sputum
- Fever
- Blood (rust coloured) in sputum
- Haemoptysis
- Chest pain
- Pleural effusion

DIAGNOSIS

Definitive diagnosis is by finding eggs on microscopy of unstained sputum (you can also find eggs in the stools, if the patient coughs up and swallows the eggs).

TREATMENT

Treat children >2yrs and adults with: praziquantel PO 25mg/kg TID for 3 days. **Praziquantel** can be given in 2nd and 3rd trimester of pregnancy.

24.3 CHRONIC RESPIRATORY DISEASES

Many chronic diseases affect the lungs. Try to find a diagnosis because the treatments are different.

24.3.1. GENERAL MANAGEMENT AND TREATMENT

TREATMENT AIMS OF CHRONIC LUNG DISEASE

- Slow the progress of the disease
- Relieve symptoms
- Improve capacity for exercise
- Improve quality of life
- Prevent exacerbations
- Prevent complications
- Educate the patient about the disease
- Psychosocial support
- Reduce number of clinic attendances

Some treatment is the same for all chronic lung disease:

Educate the patient on the disease:

- These diseases are not reversible (except asthma), so symptoms will likely become worse
  1. **STOP SMOKING**, or ask to smoke away from the patient e.g. outside the house
  2. Treat **bacterial infections** quickly – Counsel on the signs of pneumonia and when to go to clinic. If dyspnoea increases or colour of sputum changes, they must come to OPD.
  3. Consider **prophylactic antibiotics** if patient has repeated infections
  4. **Pulmonary rehabilitation:**
     - Breathing exercises to increase respiratory muscle strength
     - Gentle exercise to stay healthy

Monitor the patient's response to treatment:

- Breathing is better or worse
- Any other signs and symptoms are better or worse
- Can do more things than before the treatment Can do the same things now but faster
- Can do the same things but are not so breathless
- Can sleep better

COMPLICATIONS OF CHRONIC LUNG DISEASE:

- Recurrent chest infection
- Poor nutrition and weight loss
- Heart failure
- Secondary polycythaemia (raised haematocrit)
- Oedema due to heart failure
- Kidney problem from hypoxia of the kidney

MANAGEMENT - INHALER TECHNIQUE

When using inhalers it is very important to do it properly to make sure that the medication gets down to the lungs. Always use a spacer device to help as using an inhaler alone is very difficult.
To make a spacer device: use a 500ml plastic bottle (Fanta, Coca Cola, Sprite etc.) Make a hole in the bottom of the bottle to fit the mouth piece of the inhaler (the seal should be as tight as possible).

How to use an inhaler with a spacer:

1. Remove cap and **shake inhaler**
2. Place mouthpiece of inhaler into hole in the bottom of the spacer. Try to get as tight a seal as possible
3. **Breathe out** completely
4. **Put mouthpiece of spacer/bottle in mouth** and make a tight seal using the lips
5. As you begin to breathe in slowly and deeply, **press canister down and continue to inhale steadily and deeply**
6. Continue **5-10 breaths**
7. **Remove device** from mouth
8. If giving 2 puffs **wait about 30 seconds before repeating** process again
9. **Wash** the spacer with soap and water, leave to dry naturally, do not use a towel

Figure 24.9 Spacer device

It is important to rinse mouth out with water (spit water out, do not swallow) after using inhaled steroids to prevent oral candida

MANAGEMENT - PEAK FLOW METERS

A **peak flow meter** should be available in all clinics. It can be used for asthma and COPD to:

1. Assess how bad the lung damage is – compare to the patient's peak flow result to the normal expected values for height and age
2. Assess if there is any reversibility in the lung diseases e.g. in asthma (check peak flow before and after giving salbutamol treatment – if the peak flow improves diagnosis of asthma is likely)
3. Response to treatment (check peak flow before starting treatment and at follow up. Use this to help you decide on changing treatment)

Record peak flow measurements at each consultation.
Note: do not expect a child of less than 5-7 years to be able to perform a peak flow.

How to use a peak flow meter:

1. Move the marker to the bottom of the numbered scale.
2. Stand up straight.
3. Take a deep breath in.
4. Hold your breath while you place the mouthpiece in your mouth, between your teeth and make a tight seal.
5. Keep the peak flow horizontal.
6. Blow out as hard and fast as you can in a single blow.
7. Repeat three times and write down the highest number the patient reaches.

A **Peak Flow Chart** (*see Appendix 19*) gives normal measurements for patients according to their height and age.

Figure 24.10 Peak flow meter

24.3.2. CHRONIC OBSTRUCTIVE PULMONARY DISEASE

DEFINITION

Chronic Obstructive Pulmonary Disease (COPD) causes the narrowing of the airways so ventilation is poor. Smoking is the primary cause of COPD. This term covers many respiratory conditions:

- Chronic bronchitis: inflammation of the bronchi.
- Emphysema: damage to the smaller airways and alveoli.
- Chronic obstructive airways disease: sometimes caused by allergy and environmental factors.

COPD patients often have lower baseline oxygen saturations than normal people.
If you give them too much oxygen (e.g. when they are unwell)
the brain tells their body to breathe less which makes them worse.
Keep O2 saturations 88-92% and do not give more than 5L.

SIGNS AND SYMPTOMS

The signs and symptoms of COPD are similar to asthma. In **COPD the damage is permanent**, and **symptoms are persistent**.

SYMPTOMS

- Cough with sputum gradually getting worse. (Remember: TB is also a cause for chronic cough)
- Breathlessness and wheezing on exertion, gradually getting worse. These symptoms will eventually occur even when the patient is at rest.
- Sputum, because the damaged airways create a lot of mucus.

SIGNS

- Fast RR
- Accessory muscle working on expiration
- Hyperventilation
- Reduced chest expansion on the heart
- Resonant or hyper resonant percussion note
- Quiet breath sounds
- Wheeze
- Cyanosis
- Signs of heart failure (because of the backwards pressure from the lungs to the heart)
- Low SpO2

The patient may a baseline: fast RR/ wheeze/ cyanosis/ low SpO2.
They shoud comes to the clinic if the symptoms are **worse or different from normal**
(e.g. normally dyspnoea when walking but now dyspnoea at rest).
If the patient is having an **acute attack**, they need **emergency DRS ABCDE/S treatment**.

DIAGNOSIS

- Clinical, a chest X-ray may show hyper-expansion of the lungs +/- bullae.
- Do not forget to **rule out TB**.

EMERGENCY (ACUTE) TREATMENT

Note**: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment should be done (see p.13). You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 24.11 DRS ABCDE chart for acute COPD attack

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **COPD ATTACK**	
DRS	Danger Response Send for help	Gloves Safe place Call for help	
A	Airway obstruction Speaking, stridor, swelling, secretions	**Oxygen** maintain saturations 88-92% **Note: too much oxygen can be dangerous in these patients. Give no more than 5L.**	
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	**Salbutamol Inhaler** 10 puffs OR **If low SpO2/cyanosis/cannot speak: Salbutamol Nebuliser** 5mg STAT **Sit upright, observe HR for tachycardia**	
C	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in **IV cannula** – take bloods e.g. Hct, CBC, MS, BC, dextrose etc. If signs of shock give fluid bolus **NSS** 500ml	
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	**Antibiotic:***	**Ampicillin** IV 1g OR **Amoxicillin** PO 500mg (*see below*) (give IM ampicillin if cannot put in cannula)
		Steroid:	**Prednisolone** PO 40mg for 5 days (may need longer course) OR **Hydrocortisone** IV 100mg if unable to take PO
		Note: IV aminophylline is not recommended for COPD attack Give dextrose if low	
E	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan	
DISCUSS WITH DOCTOR			
ASSESS RESPONSE – continue cycle with CABDE/S assessment			

***Antibiotics for COPD Acute Attack:**

Most acute attacks of COPD should be given **antibiotics**. (Only mild acute exacerbations may improve with inhaled salbutamol and not require antibiotics). **Note**: This is different to asthma when antibiotics should only be given if there is evidence of infection e.g. temperature, productive cough etc.

POST EMERGENCY (CHRONIC) TREATMENT

In COPD the changes to the lung are permanent (lung tissue will not get better), and treatment for COPD may not be available. Decide on the goal SpO2 and wean oxygen as soon as possible, *see Appendix 19*.

1. **Assess for discharge**
   - Before discharge from the hospital, check the patient on the following criteria:
     - Inhaled Salbutamol < 4 hourly
     - Can walk across the room without difficulty breathing
     - Can eat and sleep without frequent stopping from to breathing difficulty
     - Clinically stable for 12-24 hr
     - Patient and caregiver can understand correct medication use
2. **Post discharge**
   - Complete 7 days of antibiotics
   - Complete 5 days of 40mg prednisolone

3. **Lifestyle and general advice**
   - Stop smoking and advise family members to not smoke around the patient
   - Exercise as much as possible, as much as their breathing allows
   - Breathing exercises
   - Advise the patient if their breathing or cough changes to seek medical attention quickly

4. **Medication**
   - Inhaled **salbutamol** 2 puffs PRN (max QID) when having dyspnoea
   - **Note:** unlike asthma, oral or inhaled steroids are not recommended for chronic treatment of COPD
   - Only slow-release low dose **theophylline** is recommended (dose depends on the brand of tablet look at specific manufacturer instructions)
   - Mucolytic (e.g. bromhexine) can be considered but may not be available. These help break down the mucous to make it easier to cough it up

COMPLICATIONS
- Recurrent chest infection
- Reduced exercise tolerance
- Poor nutrition and weight loss
- Heart failure
- Raised haematocrit (polycythaemia)
- Respiratory failure
- Pneumothorax
- Lung cancer (secondary to smoking)

24.3.3. BRONCHIECTASIS

DEFINITION
Bronchiectasis is a chronic disease of the bronchial tubes. The bronchial tubes become widened so mucous stays in the bronchial tubes, resulting in recurrent infections. These infections lead to blockage of the tubes. The blockage causes the alveoli to collapse.

SIGNS AND SYMPTOMS
- Cough with a lot of sputum every day
- Haemoptysis
- Wheezing
- Chronic sinusitis
- Loud crepitation on inspiration and expiration

DIAGNOSIS
Clinical diagnosis.
CXR may be helpful, but a CT scan is needed to confirm diagnosis which is not available in the clinics.

TREATMENT
There is no specific treatment for bronchiectasis. The patient may get recurrent infections so you need to counsel on the symptoms and follow up to get antibiotics if unwell. Larger doses and longer treatment are needed. They may need prophylactic antibiotics to stop recurrent infections.

Physiotherapy: Deep breathing followed by forced expiration helps to make secretions move from bronchi to the trachea, then can cough secretions out.

24.3.4. INTERSTITIAL LUNG DISEASE

DEFINITION
Interstitial lung disease is a disease of the soft tissue of the lung that causes damage to the walls of the alveoli. The alveolar walls become thick, so gas exchange is poor. Small blood vessels in the lung can also be affected, so blood supply to the lungs is poor. In most cases the lungs will gradually get worse, and breathing will become more difficult for the patient.

CAUSES
- No cause (idiopathic fibrosis)
- Exposure to substances like silicon
- Some medications e.g. nitrofurantoin, methotrexate
- Chronic diseases e.g. rheumatoid arthritis

SIGNS AND SYMPTOMS
- In the early stages, no signs and symptoms
- Dry cough
- Difficulty breathing start slowly then later
- becomes more and more severe
- Cyanosis
- Fast respiratory rate at rest
- Raised jugular venous pressure
- Clubbing (enlarged fingertips and a loss of the normal angle at the nail bed)
- Reduced expansion of the lung
- Fine inspiratory crepitation on both lungs

DIAGNOSIS
This is a clinical diagnosis.
CXR can be very helpful if available, it may show reticulo-nodular shadowing in the affected lung.

TREATMENT
Some interstitial lung disease may respond to steroids. Deworm before giving steroids. Counsel the patient on the side effects of steroids. Try to manage the patient's symptoms with the lowest dose of steroids. Oxygen may help breathlessness.

24.3.5. ASTHMA*UPDATE

DEFINITION
Asthma is a chronic inflammation problem of the airways with acute reversible airflow obstruction. This means airflow on expiration is blocked but can open again if control triggers and give medications. Acute asthma attacks can be triggered by different things in different people (ie. allergies, viral infection, smoke). Asthma is most common in children and young adults.

Triggers (asthma attacks can be triggered by):
- **Allergens** e.g. pollen, animal fur – often have a history of other allergies and eczema
- **Infections**
- **Air particles** (e.g. cigarette smoke, cooking fires, burning fields).
- **Drugs** e.g. aspirin, NSAIDs, beta blockers, diazepam, codeine
- Other: acid reflux, cold air, exercise, emotion, stress (e.g. maybe worse in holidays vs work/school)

Asthma can **kill** people and cause **failure to grow** in children.

SIGNS AND SYMPTOMS
- Coughing (either during day or at night, but often worse at night and with exercise and activity)
- Shortness of breath
- Wheezing when breathing out/expiration (**persistent or frequent episodes and no other causes**)
- Chest feels tight
- Symptoms occur or get worse if there are **triggers** (*see above*).
- Worsening of chronic asthma = **PEF <80% of personal best peak flow result**

DIAGNOSIS
1. **History** – What symptoms? Worse at any time of year/time of day e.g. cough at night? Any history of eczema/ allergies? Previous wheezing episodes – hospital admissions, emergency visits, ICU admissions? Current medication? Any family members have eczema/allergies/asthma?
2. **Examination** - in patients with chronic asthma, the lungs may be normal between exacerbations
3. **Peak flow** – peak flow variability (See Figure 24.12 below) for diagnosis and OD/BID checks to monitor chronic asthma. The OD/BID result is compared to the patient's personal best value (highest result they ever had). Normal: 80-100%, moderate attack: 50-80%, and severe attack <50% of the personal best value.
4. **Improvement of symptoms/peak flow after treatment** e.g. salbutamol inhaler

Note: Children <5 years might have recurrent wheezing, but not asthma. In children ≥5 years old, asthma should be suspected if cough is >3weeks, occurs at night, comes during specific season, or triggered by specific exposure (cold air, exercise, laughing, crying, or allergies).

Note: If the patient has fever, haemoptysis (coughing up blood) or green sputum then asthma cannot be the ONLY diagnosis, consider infection/TB. Asthma is commonly mistaken for a cold or chest infection which is taking time to resolve (e.g. longer than 10 days).

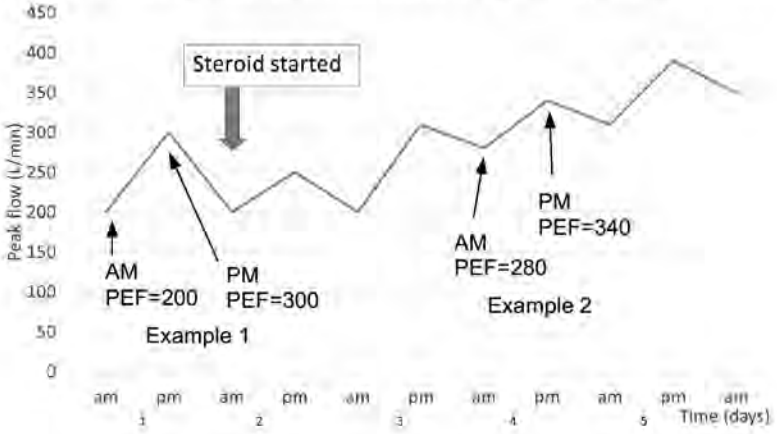
Often it is difficult to diagnose if a patient has asthma. Use the following as a guide to help you make the correct diagnosis:

Diagnosis of asthma is **MORE** likely if:	Diagnosis of asthma is **LESS** likely if:
• Above symptoms occur worse at night or in early morning, or after exercise or triggers (see above) • Symptoms worse after taking aspirin, NSAIDs or beta blockers • Personal history of other allergy or eczema • Family history of other allergy or eczema • Widespread wheeze on auscultation • Improvement in symptoms or peak flow with adequate treatment. • Eosinophilia with no other cause	• Symptoms with colds only • Isolated cough with no wheeze or shortness of breath • History of wet/productive cough • Dizziness, light headedness, peripheral tingling (suggests hyperventilating from anxiety) • Repeatedly normal examination of chest when patient feels has symptoms • Normal PEF when has symptoms • No response to treatment • Clinical features of other diagnosis e.g. significant smoking, heart disease

A **peak flow meter** can be used to help diagnosis and treatment response. In patients with asthma the PEF can change a lot because of airway inflammation.

- Record personal best PEF (the best PEF result from the patient)
- Check PEF after waking up in the morning and before bed (both at the same time every day).
  - If the PEF from morning and night are **>20% different**, you can diagnose asthma OR the chronic asthma is getting worse

Figure 24.12 Peak expiratory flow (PEF) record in a patient with asthma*new



- Normally the morning PEF is lower than the evening before bed.
- When calculating the difference between 2 PEF results, use the better (or personal best) result as the baseline .
- Example 1: Morning PEF = 200 and Evening PEF = ***300***

  % change = $\frac{300-200}{\boldsymbol{300}}$ = 33% — **33% different** is more than 20% so diagnosis is **worsening asthma**

- After starting steroids on day 2, the PEF improves
- Example 2: Morning PEF = 280 and Evening PEF = ***340***

  % change = $\frac{340-280}{\boldsymbol{340}}$ = 18% — **18% different** is less than 20% and is acceptable

- What is the % difference on day 5?

ACUTE ASTHMA ATTACK

DEFINITION

An acute asthma attack is a sudden deterioration in the asthma symptoms. **Acute asthma attacks can cause death**, so it is important to check these patients carefully and give quick treatment.

EMERGENCY ACUTE TREATMENT FOR ASTHMA ATTACK

Note**: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 24.13 DRS ABCDE chart for acute asthma attack

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **ASTHMA ATTACK**	
DRS	Danger Response Send for help	Gloves Safe place Call for help	
A	Airway obstruction Speaking, stridor, swelling, secretions	**Give 10-15L oxygen** if saturations low – **aim SpO_2 >94%.** **Note:** if not able to measure saturations then just give oxygen	
B	Assess severity of breathing problems **Are they breathless at rest?** **What is the RR?** **What are the oxygen saturations?** **Able to speak – words? Full sentences?** **Listen to the chest – any wheeze?** **Silent chest?** **Any chest indrawing?**	**Salbutamol nebuliser** Adult/>5yr: 5mg STAT; Child <5yr: 2.5mg STAT OR **Salbutamol inhaler** 10 puffs STAT (depends on severity – *see below*) **Sit upright, observe HR for tachycardia**	
C	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in **IV cannula** – take bloods e.g. Hct, CBC, dextrose etc. If signs of shock give fluid bolus **NSS** 500ml	
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	**Steroid:**	**Prednisolone** PO (continue for 7 days) Adult: 40mg; Child: 1mg/kg (max 30mg) OR **Hydrocortisone** (if cannot to take PO) Adult: IV 100mg; Child: 4mg/kg
		Antibiotic:	**Ampicillin** IV OR **Amoxicillin** PO ONLY IF SIGNS OF INFECTION e.g. fever, productive cough
		If severe and not improving, discuss with doctor and consider, IV **magnesium** or IM **adrenaline** (*see dosing chart 24.15*) Give dextrose if low	
E	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan	
DISCUSS WITH DOCTOR			
ASSESS RESPONSE – continue cycle with CABDE/S assessment			

TREATMENT

1. Use **DRS-ABCDE/S** to manage emergency cases.
2. Check vital signs and do a history and physical examination.
3. Decide the severity of the attack. (*see Figure 24.14, next page*)
   - If you find at least one high severity sign or symptom (e.g. alert but silent chest on auscultation) then treat as a life-threatening attack
   - Review the patient's conditions every 15-20 minutes to adjust the treatment

Remember that people with asthma can also have other illnesses (pneumonia, bronchitis, TB, heart failure, worms). In a patient with asthma **BE CAREFUL!** look for and treat other illnesses at the same time as the acute attack.

4. Treatment of ACUTE asthma has three parts (all are important):
   - Supportive: Oxygen
   - Short term: Salbutamol
   - Treatment of inflammation: Steroids (prednisolone or hydrocortisone)
5. Antibiotics: **Only give antibiotics if there is evidence of infection**. This is different to COPD where most exacerbations should receive antibiotics.

Figure 24.14 Assessment for the severity of the asthma attack

	MODERATE ATTACK	SEVERE ATTACK	LIFE THREATENING ATTACK
Difficulty breathing	When walking	On lying down	Always
Speaking	Normal or saying a few words	Single words (child cannot feed)	Cannot speak (child cannot feed)
Consciousness	Alert but may be anxious	Agitated or very silent and not moving	Sleepy or confused
Wheezing	At the end of breathing out	Loud	Not heard, silent chest
Accessory muscles (in drawing)	No or minimal	Usually	Unusual movement
Respiratory rate / minute (*see p.16*)	Increased	Increased	Increased or decreased
Pulse rate / Minute (*see p.16*)	Increased	Increased	Increased or decreased
Peak flow (PEF) after treatment	Value is **50% - 80%** of personal best	Value is <**50%** of personal best	Patient is very sick and PEF is not useful. Use clinical assessment until stable enough to do PEF
Oxygen Saturations (if available)	>94%	>94%	<94%
Central cyanosis	No	No	Yes

MODERATE ATTACK:	SEVERE ATTACK:	LIFE THREATENING ATTACK:
Depending on improvement likely no IPD admission needed	**Admit to IPD**	**Admit to IPD**
No oxygen needed	**Oxygen:** 5L, decrease according to saturations aim SpO_2 >94%	**Oxygen:** 10-15L decrease according to saturations, aim SpO_2 >94%
Salbutamol inhaler with spacer: 5-10 puffs each inhaled separately. Repeat every 10–20 minutes in the first hour (if necessary) then every 4-6 hours as needed until full response*	**Salbutamol inhaler with spacer**: 10-15 puffs each inhaled separately. Repeat every 10–20 minute in the first hour then every 4 hours OR **Salbutamol nebuliser** Adult/>5yr: 5mg; Child <5yr 2.5mg 3 times per hour then every 4 hours as needed until full response*	**Salbutamol nebuliser** Adult/>5yr: 5mg; Child <5yr: 2.5mg 3 times per hour then every 4 hours as needed until full response* **Note:** Give salbutamol inhaler with spacer 10-15 puffs only if do not have nebuliser, observe HR
Consider **Prednisolone PO** Adult: 40mg OD x 3 days Child: 1mg/kg (max 30mg) x 3 days Use if have other signs of moderate attack: moderate wheeze, difficulty breathing, etc	**Prednisolone PO** Adult: 40mg OD x 3-5 days Child: 1mg/kg (max 30mg) x 3-5 days If vomiting/cannot take PO consider IV **hydrocortisone**	**Hydrocortisone IV** Adult: 200-250mg QID Child: 4mg/kg (max 100mg) QID Switch to PO prednisolone when can take PO If no improvement, consider: **Adrenaline** IM OR **Magnesium** IV *(see below for doses)*

*__FULL RESPONSE__ = PEF >80% of personal best, RR and HR; speak and breathe normally; no agitation or confusion; chest auscultation with minimal wheeze or is clear; no more chest indrawing.

Considerations:

- If >2yrs old an inhaler with a spacer works as good as nebuliser (but not for life threatening asthma)
- Always deworm patients if you give steroids
- Give hydrocortisone IV if the patient cannot take oral prednisolone

Figure 24.15 Doses of drugs used to treat asthma*update

1. SALBUTAMOL		**4. ADRENALINE** IM (1:1000 = 1mg/ml):		
Inhaler:	One puff is 100 microgram salbutamol (you can use up to to 10 puffs every 10 - 30 minutes)	Adult: Child:	 >12yrs 6 –12yrs 6mths – 6 yrs < 6mths	0.5 – 1ml 0.5ml 0.25ml 0.12ml 0.05ml
Nebuliser:	Adult/>5yr: 5mg; Child <5yr: 2.5mg Repeat every 20-30 min for 3 times then every 4 hours			
Oral:	(only use if inhaled/nebuliser is not available)	**Use the 0.5ml insulin syringe to give adrenaline in children**		
Adult: Child<12yrs	2-4mg TID or QID 1-2mg TID			
Note: Stop beta blockers, risk of miscarriage in first 6m of pregnancy, observe HR for tachycardia				
2. PREDNISOLONE PO		**5. MAGNESIUM** IV (**Note**: evidence is limited)		
Oral:		Adult: Child:	1.2 - 2g IV over 20 minutes 40mg/kg (max 2g) over 20 minutes	
Adult: Child:	40mg OD in the morning x 3-5 days 1mg/kg OD in the morning (max 30mg) x 3-5 days			
3. HYDROCORTISONE IV		6. OXYGEN *See Appendix 19 for weaning guidelines*		
Adult: Child:	100mg QID (up to 250mg if severe) 4mg/kg (max 100mg) QID			
Change to PO prednisolone as soon as possible (can also use IV dexamethasone)				

DRUGS SIDE-EFFECTS

- Only use salbutamol tablets when inhalers and nebulisers are not available because they have greater side effects and are slower to act.
- Salbutamol often causes tachycardia. Observe HR especially if the patient has risk for heart disease
- Salbutamol and steroids can decrease potassium levels. This may lead to life threatening electrolyte imbalance (*see p.64*). If possible check potassium levels or give high potassium foods (banana, potato, beans).
- For pregnant women and persons with cardiovascular disease (coronary artery disease, congenital heart disease, high BP, high cholesterol) avoid aminophylline.
- Long term steroids can make many infections worse. Remember worms (including strongyloides), amoeba, TB, and other bacterial infections can get worse when using steroids. Take a good history for TB, amoeba, other infections. Give albendazole to prevent spread of worms.

TREATMENT AFTER DISCHARGE

Moderate Attack:
- **Prednisolone** PO for total 3 days
- **Salbutamol inhaler** and spacer (2-10 puffs every 4-6 hrs) for 3 days, then PRN
- Follow up 4 weeks

Severe Attack:
- **Prednisolone** PO (total 3-5 days)
- **Salbutamol inhaler** and spacer (2-10 puffs every 4-6 hours) for 3-7 days, then PRN
- Follow up 2-4 weeks

Life-threatening attack:
- **Prednisolone** PO for total 5-10 days
- **Salbutamol inhaler** with spacer (2-10 puffs every 4-6 hours) for 3-7 days, then PRN
- Follow up 1 week

For all patients:
- Give salbutamol inhaler to take home if possible
- Preventative medication e.g. budesonide, oral aminophylline
- Return to clinic if not better/worse or no more inhaler
- Follow up earlier if inhaler finished

CHRONIC ASTHMA

PREVENTION / LONG TERM TREATMENT

When discharging a patient make sure you give them: general advice, long term medical treatment, what to do if has asthma attack at home, and follow up instructions:

General Advice:

1. Health education – if possible, avoid triggers e.g. stay away from animals, smoke from wood or farm fires
2. Do not smoke/ stop smoking, advise people should smoke away from patient e.g. smoke outside house.
3. Always carry a salbutamol inhaler in case of attack.
4. Come to clinic early if symptoms not being relieved by inhaler >10 puff every 4 hours or PEF <80% of personal best or PEF variability >20%, even if the patient has no difficulty breathing.

Long Term Medical Treatment: (You may consult a doctor about which preventative medication to use)

INHALERS

- Types of inhalers:
- **Note**: Salbutamol ALONE does not prevent asthma symptoms or attacks
    - **Preventer inhalers** STEROID e.g. budesonide these inhalers are taken regularly to prevent symptoms. Rinse mouth out with water (spit water out) after use to prevent oral candida.
    - **Reliever inhalers** SALBUTAMOL these inhalers should only be used when the patient has symptoms (sometimes taken regularly after an acute attack)
- If you do not have steroid inhalers, you can use a low dose of oral steroids for patients who have symptoms very often (discuss with a doctor or your team).
- It is important to **counsel the patient**
    - How to use inhalers +/- spacer
    - How many puffs to take how many times a day
    - When to take each inhalers e.g. budesonide every day vs salbutamol PRN
- The dose of preventer inhaler depends on the response. Use the lowest dose to control symptoms.
    - OPD patient (**mild** attack) with persistent symptoms: Budesonide 1 puff BID (**low dose**).
    - IPD patient discharged after **moderate** attack: Budesonide 2 puffs BID (**moderate dose**).
    - IPD after **severe/life threatening** attack: Budesonide 4 puffs BID (**high dose**).
- CONTROLLED SYMPTOMS = PEF is ≥80% of personal best, use salbutamol ≤2 times/wk, or wake up with symptoms ≤2 nights/mo. If more symptoms than this, increase the preventer inhaler dose.

THEOPHYLLINE/AMINOPHYLLINE

- **Note**: oral theophylline is safer than aminophylline.
- Dose depends on the brand of tablet (look at specific manufacturer instructions).

Advice for asthma attack at home:

- Do not lie down
- If acute dyspnoea:
    - Take salbutamol inhaler 10 puffs
    - If no improvement in 10 minutes: take salbutamol inhaler 10 puffs again
    - If again no improvement to come to clinic.
- If patient needs the salbutamol inhaler more than 10 puffs every 4 hrs they must come to the clinic.

FOLLOW UP

1. Follow up in OPD (**check peak flow value and compare to patient's personal best value**). *See p.249.* Decrease the inhaler/tablet step by step to the minimum dose that fully controls symptoms. If symptoms come back or PEF <80% personal best (or PEF variability >20%), increase the dose of steroid inhaler again. If the PEF is normal, continue or decrease the treatment.
2. Review the patient every month or when the steroid inhaler is nearly empty.
3. Review inhaler with spacer technique at each follow up appointment.
4. Keep the patient at this dose all the time to help control the symptoms.
5. If asthma attacks reduce to < 1 per month try to stop steroid inhaler/theophylline/aminophylline and give inhaled salbutamol when symptomatic.

Remember: drugs such as beta blockers or NSAIDs e.g. ibuprofen can cause an asthma attack or make asthma worse so do not prescribe these drugs.

24.3.6. TUBERCULOSIS

SURVEILLENCE
see Appendix 7

DEFINITION
Tuberculosisis is a contagious disease caused by *Mycobacterium tuberculosis* (and occasionally by *Mycobacterium bovis* and *Mycobacterium africanum*), which are also known as TB bacilli.

TB commonly attacks the lungs (**pulmonary TB**) but can cause disease in any part of the body such as the lymph nodes, pleural cavity, bones and spine, brain, abdomen, eyes, genito-urinary tract and the skin (**extra-pulmonary TB**).

TB Transmission:
TB infection is transmitted by air. A major source of infection is a patient with pulmonary TB who is coughing and whose sputum smear is positive (i.e. TB bacilli can be seen in sputum microscopy). If an infectious person coughs or sneezes, tiny infectious particles of respiratory secretion, which contain TB bacilli, are produced. These infectious particles can remain in the air for a long period. Therefore, people in close contact with an infectious person breathe in air containing infectious particles of TB bacilli.

TB Disease:
A person infected with TB does not necessarily feel unwell and such cases are known as **silent or 'latent' infections**. When the lung disease becomes 'active' and symptoms develop, such cases are diagnosed with 'TB Disease'.

- In HIV uninfected populations, only 1 person out of 10 TB-infected people develop TB disease.
- In HIV infected populations, the proportion of developing TB disease is much higher. A HIV infected person has a 21-34 times higher risk of developing TB disease than a HIV uninfected individual.

CLASSIFICATION

1. Pulmonary TB (lungs) - most common site
2. Extrapulmonary TB (outside lungs)

Common locations
- Pleural
- Lymph nodes (commonly in neck)
- Brain
- Abdomen
- Pericardium (heart)
- Spine, other bones and joints

Less common locations
- Genital tract
- Kidney
- Adrenal gland
- Skin

SIGNS AND SYMPTOMS

1. **Pulmonary TB**
   - The most common symptoms of Pulmonary TB are:
     - Cough of any duration (with or without sputum production)
     - Fever of unknown cause > 2 weeks
     - Weight loss in the past three months
     - Drenching night sweat
   - Other symptoms:
     - Respiratory: coughing up blood, chest pain, breathlessness
     - General: tiredness, decreased appetite and secondary amenorrhoea (*see Figure 24.16*)

If the patient has one or more of the above signs and symptoms, suspect TB and start investigation for TB diagnosis.

   - Physical Signs
     - Non-specific and similar to other lung diseases
     - General signs: fever, tachycardia, finger clubbing
     - Respiratory signs: often no abnormal signs in the chest, may be crepitations, wheeze or bronchial breath sounds.

2. **Extrapulmonary TB**
    - TB outside the lungs may present with the following:
        - **Pleural effusion**: chest pain, dullness on percussion, low or no air entry on affected side.
        - **Lymphadenopathy**: enlargement of lymph nodes, usually in the neck and bilaterally.
        - **TB spine or bone**: deformity, chronic bone infection.
        - **TB brain**: signs and symptoms of meningitis (headache, neurological deficit, loss of consciousness).
        - **TB abdomen**: ascites, abdominal mass.

DIAGNOSIS

If you suspect a patient has TB you should:

- Assess for danger signs
    - RR > 30/min
    - PR > 120/min
    - Temp > 39°C
    - Unable to walk
- **Follow the algorithms below** depending on if the patient has danger signs or not:

TESTS USED IN THE DIAGNOSIS OF TB

For Pulmonary TB

1. Sputum for microscopic examination of Acid Fast Bacilli (AFB):
    - Called AFB as the bacilli are resistance to losing their colour by acid
    - Need to collect sputum 2 days in a row
    - It is a simple, rapid and reliable test for sputum smear positive cases
2. Molecular technique (MTB/Rif Assay called GeneXpert test):
    - Rapid result within a few hours if machine is where sample is collected
    - Can be used to see if the Mycobacteria is resistant to rifampicin – if it is resistant it is a sign that it could be a multi-drug resistant TB (MDR TB)
3. Culture (growing bacilli in special media) (if available):
    - More specific test but results take longer (4-6wks), needs good technology, skills and is expensive
    - Used if:
        - Clinically suspect cases of smear positive and GeneXpert negative
        - Confirmation of treatment failure
        - Diagnosis of drug resistant TB (including MDR TB) together with drug susceptibility testing
4. Chest X-Ray: useful for smear negative pulmonary TB like pleural effusion, miliary TB, and TB in children
5. Tuberculin skin test: if positive is a sign of exposure to TB, it does not mean the patient has TB disease

For Extra-pulmonary TB

1. FNAC (fine needle aspiration cytology) for lymphadenopathy
2. Chest X-Ray: TB Pleural effusion, TB Pericarditis
3. Spine and Bone X-Ray: bone and spine TB
4. Thoracocentesis (pleural tap) and examination of pleural fluid: TB pleural effusion
5. Lumbar puncture and examination of CSF: TB meningitis
6. Abdominal paracentesis and examination of peritoneal fluid: TB abdomen

Multi-drug resistant TB (MDR TB) is a problem in the border area.
Diagnosis and treatment of MDR TB should be integrated within a TB program.

Figure 24.16 Managing a TB suspect WITHOUT Danger signs*

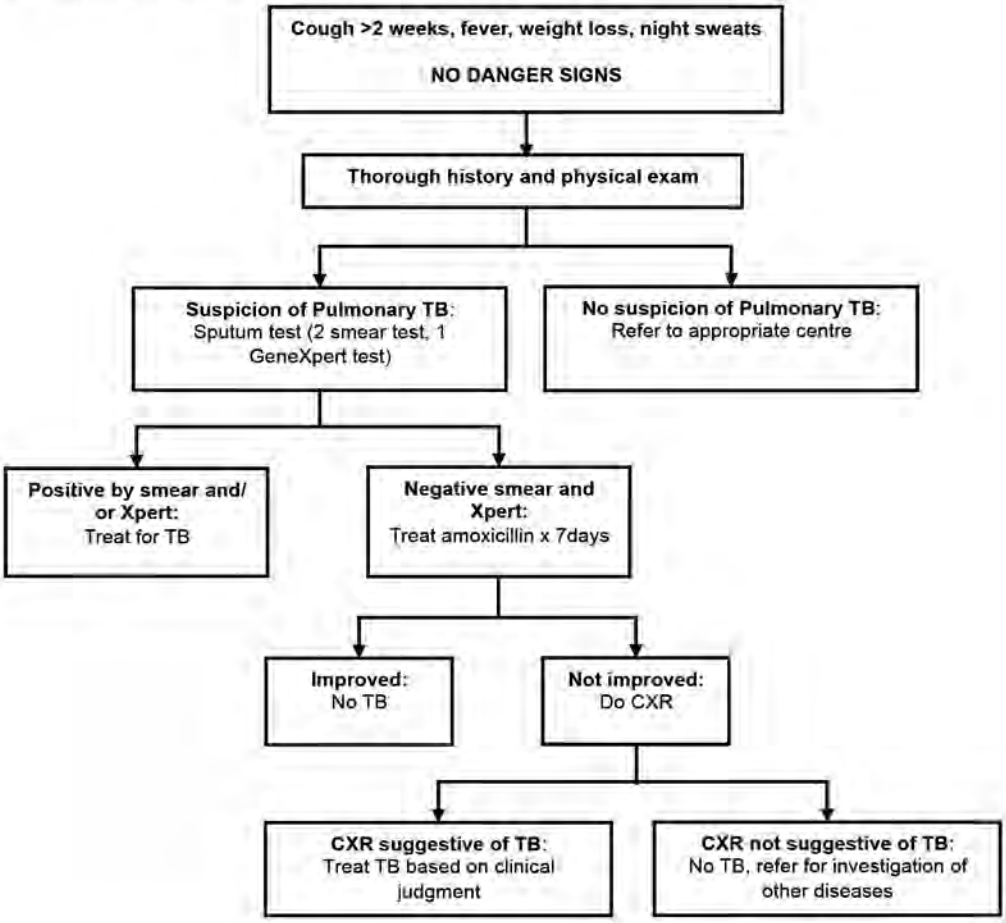
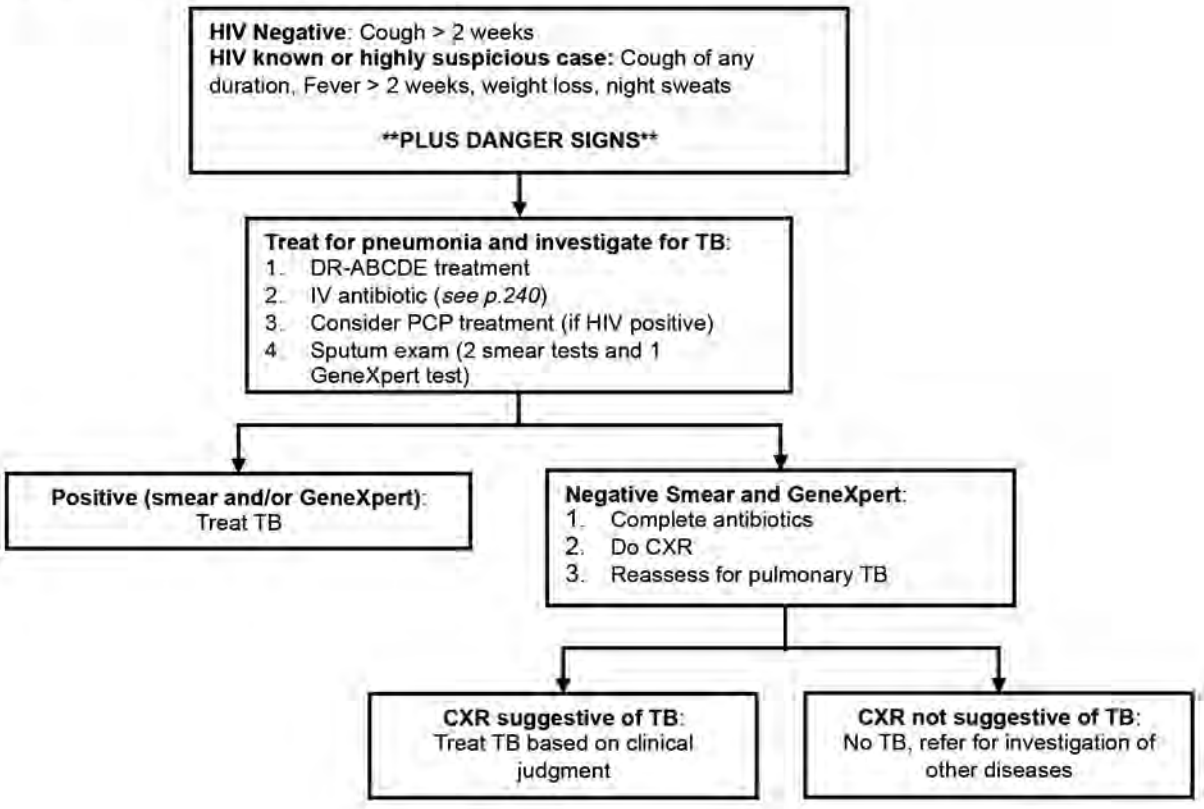


Figure 24.17 Managing a TB suspect WITH **DANGER SIGNS**



*Danger signs are RR>30, PR>120, T>39°C, cannot walk.

TREATMENT

TB can be cured by using effective treatment regimens:
1. Daily ingestion of anti-TB drugs without interruption.
2. Multi drug therapy (4-5 drugs).
3. At least 6-8 months duration of drug therapy.
4. Use of quality drugs.

FIRST LINE ANTI-TB DRUGS AND RECOMMENDED DOSAGES:
(see tables below for weight-based dosage as an example)

Anti TB drugs	**Daily treatment (mg/kg)**	
	Children (<30 kg)	**Adult**
Isoniazid (**H**)	10 (10-15)	5 (4-10)
Rifampicin (**R**)	15 (10-20)	10 (8-20)
Pyrazinamide (**Z**)	35 (30-40)	25 (20-30)
Streptomycin (**S**)	15	15
Ethambutol (**E**)	20 (15-25)	15

Note: Consider age, body weight, existing liver or renal diseases, pregnancy and previous history of TB treatment before choosing a treatment regimen and the dosage

Early screening and taking effective treatment can break the chain of transmission.
It is strongly advised that those patients who are coughing for more than 2 weeks or have other signs and symptoms suspected of TB should undertake TB screening as early as possible.

TREATMENT REGIMENS WITH TB DRUGS:
The preferred standard short course regimen according to WHO guidelines:

New Treatment Case – Category I	**Initial Phase (2 months)**	**Continuation Phase (4+ months)**
Sputum positive **Sputum negative** **Extra pulmonary**	HRZE x 2 months	HR x 4 months
TB Bone/joint	HRZE x 2 months	HR x 7 months
TB Meningitis	HRZE x 2 months	HR x 10 months

Note: May need to extend Initial phase 1 extra month with HRZE if sputum smear examination after 2 months of treatment is still positive.

Re-treatment Case – Category II

Sputum positive, Sputum negative, or Extra pulmonary		
	Initial Phase (3 months)	**Continuation Phase (5 months)**
If **less than 5 months of E** in the previous treatment	SHRZE x 2 months Then HRZE x 1 month	HRE x 5 months
If **more than 5 months of E** in the previous treatment	SHRZE x 2 months Then HRZE x 1 month	HRZE x 5 months

Note: May need to extend Initial phase 1 extra month with HRZE if sputum smear examination after 3 months of treatment is still positive.

IMPORTANT

Drug adherence and completion of treatment is essential in order to prevent treatment failure and developing Drug Resistant TB (DRTB).

Special considerations in treatment:

Pregnancy

- Patients should avoid getting pregnant during treatment (*See family planning p.87*).
- Rifampicin makes oral contraceptive pills less effective. Use other form of contraceptives e.g. injection Depo-Provera.
- If pregnant: streptomycin is contra-indicated as it can cause deafness to the baby. Use ethambutol instead.

EXAMPLES OF NUMBER OF TABLETS OF ANTI-TB DRUGS ACCORDING TO WEIGHT

Sample regimens (Category I) with separate anti-tuberculosis drugs in Adults

Phase	Weight in Kg			
	30-39	40-54	55-70	>70
Initial Phase – Daily				
H 100mg	1.5	2.5	3	3.5
R 150mg	2	3	4	5
Z 400mg	2	3	4	5
E 400mg	1.5	2	3	3.5
S 1g (in TB meningitis)	0.5	0.75	1	1
Continuation Phase – Daily				
H 100mg	1.5	2.5	3	3.5
R 150mg	2	3	4	5

Sample regimens with fixed-dose combination of anti-TB drugs in Adults 2HRZE+4HR or 2HRZE+10 HR

Intensive phase									
Regimen	Drugs	Weight							
		21 – 29	30 – 34	35 – 39	40 – 49	50 – 54	55 – 64	65 – 70	> 70
2RHZE	RHZE 150 - 75 - 400 - 275	2	2	2 ½	3	3	4	4	5
Continuation phase									
4RH (10 HR for TB meningitis)	RH 300 – 150 RH 150-100	1	1	1 1	1 1	1 1	2	2	2 1

Dosage of anti-TB drugs (number of tablets) in children according to weight bands

Body weight bands (kg)	Isoniazid (100mg tablet)	Rifampicin (300mg tablet)	Pyrazinamide (500mg tablet)	Ethambutol (400mg tablet)
<5	0.5	0.33	0.33	0.33
5 to 10	1	0.33	0.5	0.33
11 to 15	1.5	0.66	1	0.5
16 to 20	2	1	1.33	1
21 to 25	2.5	1.33	1.5	1
26 to 30	3	1.5	2	1.5

PREVENTION & VACCINE

BCG Vaccination for children

- Routine vaccination to all infants in an area with high TB prevalence is recommended:
- It protects against severe forms of TB such as meningitis, miliary TB in infants.
- Vaccination lasts for 15 years in well-nourished children.
- It is safe to give in HIV infected children but is contraindicated in active AIDS

Maintaining Good Hygienic Practices

- Always cover mouth and nose with a tissue or cloth (e.g. hankerchief) when coughing or sneezing.
- Keep doors and windows open during the day to provide ventilation and sunlight exposure.
- Spit only into a container.
- Proper disposal of excreta (sputum, saliva) from TB patients (burning, dumping in a pit).
- Keep good personal hygiene – regularly wash hands, take showers, wash hair, wear clean clothing, cut nails.

Improve Fitness

- Enough sleep, healthy diet, physical exercise. Do not smoke.

DRUG SIDE EFFECTS

Approach to drug side effects:

- Identify responsible drugs.
- Rule out other possible cause e.g. scabies for itchiness, viral hepatitis for jaundice.
- Evaluate risk of side effects versus the consequences of treatment interruption.
- Minor: encourage the patient to continue anti-TB and symptomatic treatment, e.g. chlorpheniramine for itchiness, paracetamol for joint pain, advise the patient to take their medication at bed-time.
- Most minor side effects are resolved within 2-3 weeks.

Figure 24.18 Side effects of TB drugs

SIDE EFFECTS	RESPONSIBLE AGENT	INTERVENTION
Orange-red urine	Rifampicin	Explanation and encouragement, no harm, normal staining from drug
Peripheral neuropathy (early symptoms: paraesthesia, then prickling and burning in feet, later in hands)	Isoniazid	Prevention by taking **vitamin B6 (pyridoxine)** 10mg OD prophylaxis. Treatment – 100-200mg of vitamin B6 daily (high dose may reduce the effectiveness of isoniazid)
Hepatitis (Jaundice)	In descending order: 1. Pyrazinamide 2. Rifampicin 3. Isoniazid	Stop treatment. Start re-introductory schedule when signs and symptoms of hepatitis are resolved. In case of recurrent hepatitis or severe hepatitis – use alternative treatment regimen SHE x 2 months + HE x 10 months
Impaired vision (Eye) (Early signs: blurred vision, decreased visual acuity, red-green blindness)	Ethambutol	These symptoms are reversible a few weeks after stopping. A dosage of 15mg/kg is generally safe to use. However, if optic neuropathy is established, it is not reversible.
Vestibulo-ototoxicity (Ear) (At early stage: dizziness, vertigo, ear ringing) and **renal toxicity**	Streptomycin	Reduce dose according to weight of the patient. If it does not work, may use alternate day injection of 3 times per week. If persistent or side effects getting worse– may stop streptomycin. In elderly patients and patients less than 35kg – 500mg dosage is safe and effective. If deafness is established, it is not reversible.
Skin manifestation or generalised hypersensitivity	All agents in descending order: 1. Streptomycin 2. Ethambutol 3. Pyrazinamide 4. Rifampicin 5. Isoniazid	Minor (itchiness and rash): symptomatic treatment with **chlorpheniramine** and Calamine lotion Severe Steven Johnson Syndrome (fever rash, muco-cutaneous eruptions): stop treatment. Start re-introductory schedule when the symptoms are resolved.
Joint pain	Pyrazinamide	Symptomatic treatment with **paracetamol** (or **ibuprofen** if not better with paracetamol alone), usually resolves after 2 weeks
Gastrointestinal upset (nausea, vomiting and abdominal pain)	Rifampicin	Give after small meal Symptomatic treatment: **omeprazole** or **metoclopramide**. Administer 2 hours before or 3 hours after TB medication
Shock, purpura, acute renal failure	Rifampicin	Stop rifampicin. Never reintroduce rifampicin again.

Skin diseases are very common. Many skin diseases are related to poor hygiene.

Take a good history:

- When did the lesions start?
- Where did they start?
- Did they spread?
- Are they itchy?
- Are there risk factors for skin disease?
- Take note of patient's job and allergy history
- Are there any other symptoms: fever? Joint pain? Headache? Fatigue?

Examine the entire body and describe the lesions:

- Where?
- How many?
- What colour
- What shape (flat or raised)?
- Hot or cold?

Before starting any treatment, clean the lesions with water and soap.

25.1 BACTERIAL SKIN INFECTIONS

Remember: any skin lesion can become infected
If skin lesions are wet with pus, red, warm/hot, or if the patient has fever suspect a bacterial infection and treat with the following antibiotics: (*see below for specific diseases*)

Cloxacillin:

		Mild Infections	Moderate Infections	Severe Infections
Adult:		500mg QID PO	1g QID PO	1g QID IV
Child:	10-18yrs	250mg QID PO	500mg QID PO	50mg/kg QID IV (max 1g)
	2-9yrs	125mg QID PO	250mg QID PO	50mg/kg QID IV (max 1g)
	1m-2yrs	62.5mg QID PO	125mg QID PO	50mg/kg QID IV (max 1g)

Erythromycin (if allergic to penicillin):

		Mild Infections	Moderate Infections	Severe Infections
Adult:		500mg QID PO	1g QID PO	12.5mg/kg QID IV
Child:	10 - 18yrs	250-500mg QID PO	500mg-1g QID PO	12.5mg/kg QID IV (max 1g)
	2 - 9yrs	250mg QID PO	500mg QID PO	12.5mg/kg QID IV (max 1g)
	1m - 2yrs	125mg QID PO	250mg QID PO	12.5mg/kg QID IV (max 1g)

25.1.1. IMPETIGO

For photo, *see Appendix 1*

DEFINITION
This is a bacterial infection of the skin caused by *Staphylococcus aureus*. It spreads easily amongst children. Transmission is by direct contact. Often starts after a bite or a scratch. Rash can increase over days to weeks. The lesions are red, round, flattish, with golden coloured crusts that are usually 0.5 to 3cm in size. They are sometimes wet. Treat also any other associated skin disease (scabies, ringworm, eczema etc.).

For all patients:

- Keep away from school until crusts are dry.
- Treat any other skin disease e.g. scabies, eczema,
- Ask siblings and other close contacts to come to the clinic if they have lesions
- Wash clothing and towels daily until infection is resolved.

LOCALISED IMPETIGO

Note: If the patient is a neonate go directly to extensive impetigo.

SIGNS AND SYMPTOMS

Less than 3 spots with pus and red skin on only **one part of the body**, often around the mouth, behind the ears, on the hands or feet. No fever.

TREATMENT

- Clean with water and soap or antiseptic (e.g. **povidone**, **chlorhexidine**, or **savlon**) 2 times per day and dry.
- Keep dry (if on the buttocks of children, leave them uncovered).
- Cut the fingernails, cut hair short around lesion (shave head if a lot of lesions on scalp).

EXTENSIVE IMPETIGO

SIGNS AND SYMPTOMS

Neonates, or **more than 3 lesions** or impetigo on **more than one part of the body**.

TREATMENT

- Give the same local treatment as for mild infections.
- Give PO **cloxacillin** (if allergic to penicillin: **erythromycin**)
- Incise abscesses.

25.1.2. ABSCESS

DEFINITION

This is a collection of pus in the soft tissues, most commonly due to *Staphylococcus aureus*. There is a red, painful, hot, localised swelling. There may be fever and lymphadenopaty. Antibiotics cannot go in the abscess cavity, so the treatment is to cut open and remove the pus. (incision and drainage).

Some abscesses are not hot and not painful (**'COLD' abscess**). If you find this, **think of TB**.

TREATMENT

FIRST STAGE: the skin is hard.

- Apply warm compresses four times per day.
- Treat the pain with paracetamol or ibuprofen
- **No antibiotic is needed for this stage**
- Give **cloxacillin** for 7 days (or **erythromycin** if allergic to penicillin) if the patient also has:

Cellulitis

  - General symptoms (fever, chills)
  - Children < 1 year
  - Abscess on the head/neck or hand, multiple abscesses
  - Abscess on the breast and mastitis, give 10 days **cloxacillin** (500mg QID)
- If the wound is very unclean or contaminated e.g. consider adding **metronidazole** and/or **ciprofloxacin** to cover bacteria from soil or water.

SECOND STAGE: very painful. One point on the skin (above the pus collection) is soft and should be opened.

- Wash hands, use gloves and sterile materials.
- Use local lidocaine injection for pain relief.
- Cut with a sterile blade.
- Remove the pus. Clean inside the cavity. Break down all lobes of the abscess.
- Wash with normal saline.
- Insert a gauze dressing soaked with normal saline into the hole as a 'wick'.
- Change dressing daily until the hole begins to close. Do not clean with gauze and iodine: you will destroy all the new tissue. Flush gently with normal saline until clean water comes out.
- Be careful when using gauze packing. If small pieces are left inside the abscess (foreign body), the abscess cannot heal and will become chronic.
- Abscesses in the buttocks are at risk to develop fistula with the anus. Follow these cases carefully with daily normal saline flush.

Always think about what can be injured when doing an incision and drainage.
Is there a nerve nearby? A blood vessel? Be careful in the face, neck and other sensitive areas.

If an abscess or other bacterial skin infection does not improve on usual antibiotics think about drug resistant *S. aureus*, especially if already on antibiotics (*see p.163. MRSA*) or melioidosis especially in patients with risk factors (*see p.162*)

25.1.3. CELLULITIS AND ERYSIPELAS

For photo, *see Appendix 1*

DEFINITION

This is an acute bacterial infection spreading under the skin. Streptococcus pyogenes or group A streptococci and Staphylococcus aureus are the most common causes of cellulitis. Streptococci (beta haemolytic) are the most common cause of erysipelas. They enter the body through a previous wound, a scratch or when the skin is cut open for surgery. Look for the port of entry.

SIGNS AND SYMPTOMS

- Redness
- Swelling (not localized like and abscess)
- Borders not well defined, but for erysipelas there may be clear borders
- Fever, chills or rigors (especially for erysipelas)
- Pain
- Local lymph node enlargement

Note: If the cellulitis causes deep ulcers very quickly (within a week), this could be "**necrotising fasciitis**", caused by many organisms including *group A Streptococcus* (group A strep), *Klebsiella, Clostridium, E. coli, Staphylococcus aureus*. Necrotising fasciitis can be life threatening and must be treated immediately.

There is a risk for sepsis during cellulitis because bacteria spread to the blood.
To prevent septicaemia, it is important to diagnose early and start correct antibiotic treatment.

TREATMENT

- Immobilisation and elevation of the limb (higher than the heart)
- Cool and wet dressing
- **Do not cut open**
- Give **paracetamol** or **ibuprofen** for pain and inflammation
- Give antibiotics:

1. **Mild cases**
   - **Cloxacillin** PO x 7 days and follow up regularly
   - If penicillin allergic use **erythromycin** PO
   - If no improvement after 3 days, or getting worse: admit to IPD and change to severe case.
2. **Severe cases**: high fever, patient unwell.
   - Admit to IPD, do blood culture
   - Start 2 intravenous antibiotics (use both cloxacillin and benzyl penicillin)

Cloxacillin IV	Adult: 1g QID;	Child >1mo: 50mg/kg QID (max 1g QID)
Benzyl penicillin IV	Adult: 1.2g QID;	Child >1mo: 25mg/kg QID

   - If no improvement after 48 hours or the condition is getting worse, add **gentamicin** OD (4mg/kg neonates; 5-7mg/kg in children and adults) for 3-5 days.
3. **Suspect necrotising fasciitis**
   - Consider referral – patient may need surgery for wound cleaning
   - Remove all necrotic tissue and clean with normal saline 1-2 times daily.
   - Cover with wet gauze (use NSS) and then wrap around with dry gauze
   - Treat with IV **cloxacillin** as per severe cellulitis.
   - If available use **clindamycin.** Clindamycin provides bacterial anti-toxin effect and will help the infection improve. Use antibiotics until the ulcers are improving and no more cleaning is needed.
     - Adult: 600mg - 2.7g IV daily in 2-4 divided doses OR 450mg PO QID
     - Child: 10mg/kg (max 1.2g) IV QID OR 6mg/kg (max 450mg) PO QID

25.2 FUNGAL SKIN INFECTIONS

25.2.1. CANDIDA

For photo, *see Appendix 1*

DEFINITION
Fungal infection of the skin or mucous membranes, sometimes also called 'thrush'. It is mostly seen in patients with previous use of antibiotics, diabetes mellitus, decreased immunity or pregnancy. Common types of infection are oral candidiasis and vaginal candidiasis. (Oral candidiasis is common in neonates or elderly but uncommon for other ages. If find oral candidiasis in other age groups then consider additional diagnosis of immunosuppression e.g. HIV, cancer.

SIGNS AND SYMPTOMS
- Oral Candidiasis: white spots in the mouth (cannot remove), painful and difficult swallowing.
- Vaginal Candidiasis: white discharge with itching

TREATMENT
ORAL THRUSH
- **Nystatin 400,000 IU/day** – give 1 lozenge in the mouth QID for 7 days or 1ml of oral suspension (100,000 IU) QID for 7 days. Oral suspension should be swished around the mouth and swallowed. For treatment in HIV/AIDS patients, *see p.151*.

VAGINAL CANDIDIASIS
- *See p.225*

25.2.2. RINGWORM

For photo, *see Appendix 1*

DEFINITION
Fungal infection of the skin.

SIGNS AND SYMPTOMS
- Round dry lesions that grow slowly (taking weeks to months)
- Dry white scales on the edges with a clearing in the centre, they are very itchy, not painful
- No fever
- Sometimes there are pustules
- On the scalp it may be associated with localised loss of hair

TREATMENT

Local treatment on skin (tinea corporis):
- Clean with soap and water BID, **ketoconazole** 2% cream BID for 2 wks or longer if necessary.
- Alternative topical antifungals: **clotrimazole**, **miconazole**, or **Whitfield ointment**.

Treatment for scalp (tinea capitis):
- If on head cut hair short around lesions (shave head if many lesions on the scalp, counsel family to use a new razor and not to share razors between persons).
- Treat any bacterial super-infection first
- If scalp ringworm: need to also give oral antifungals
  - **Griseofulvin** PO for 6 weeks (can give up to 12 weeks)
    - Child <12yrs: 10-20mg/kg per day (max 500mg per day)
    - Children >12yrs/Adults: 500mg OD (750mg OD if severe infection)
      Contraindicated in pregnant women
- Can also use **Whitfield cream** on the scalp (if available)

Note: men should not make their wives pregnant within 6 months of the griseofulvin treatment, women should wait until 1 month after treatment before getting pregnant.

Note: For adults over 35 years, consider checking baseline liver function tests before treatment, and again at 4 weeks.

If there is no improvement, make sure it is not leprosy.

25.3 VIRAL SKIN INFECTIONS

25.3.1. HERPES SIMPLEX

For photo, see Appendix 1

DEFINITION
Recurrent infection of skin and mucous membranes due to infection with *Herpes Simplex Virus* (HSV). After the first infection, the virus stays in the body and can return if the person has another illness, is stressed or exposed to cold or sunlight. Common places: lips, mouth, eyes and genital area. Herpes is spread by direct contact with lesions. Herpes lesions heal by themselves in approximately 10 days.

SIGNS AND SYMPTOMS
- Group of small vesicles filled with clear fluid on the skin or the mucosa (mouth or genital area).
- Often the vesicles have broken and become crusted when the patient comes to the clinic.
- Very painful, may have tingling and itching before the lesions appear.
- Mouth: Pain and difficulty eating. Ulcers in the mouth and on the lips. Often the gums are swollen.

COMPLICATIONS
Infections in the eyes can be severe and cause keratitis and blindness (*see eye infections, p.80*).

If a pregnant woman has a genital lesion, it can be very dangerous for the newborn baby because the baby can become infected during delivery.

TREATMENT

Mild or moderate infections:
- Supportive care. No antiviral medication needed.

Severe cases with necrotic lesions or extensive lesions or in the face spreading to the eye:
- Oral **acyclovir**, if available, 200mg 5 times/day for ≥5 days, **start in the first 48 hrs** of symptom onset.

1. On the skin
   - Clean lesions with antiseptic solution (e.g. **povidone**, **chlorhexidine**, or **savlon**) and let dry.
2. In the mouth:
   - Swish and spit with warm salty water.
   - If secondary infection, treat with **amoxicillin**.
3. In the eyes:
   - Wash the eyes with cool boiled water.
   - Apply ointment to the eye e.g. **TEO** to keep moist.
   - Refer to eye doctor for consultation.
4. On the genitals:
   - Wash with soap and water. Give **paracetamol** for pain. Condoms help prevent the spread of herpes.
   - Check for other STIs.
   - Men or women who have difficulty passing urine need oral **acyclovir**.
   - Acyclovir is not known to be harmful in pregnancy. Active genital herpes at delivery should have caesarean section.

For eczema herpeticum, see p.269.

25.3.2. VARICELLA ZOSTER

For photo, see Appendix 1

CHICKENPOX

DEFINITION
This is a very common disease caused by the *Varicella zoster* virus, and spreads easily. Other persons in the family or in the neighbourhood might have the same symptoms.

SIGNS AND SYMPTOMS
- Slight fever, headache, feeling unwell
- Itchy, round spots of different sizes with clear liquid inside, some may be crusty. Some lesions are old and some are new.
- Whole body: more on the trunk and less on the arms and legs

TREATMENT

- Clean with water and soap. Use **calamine lotion** to help itching.
- Cut the fingernails, to reduce damage from scratching.
- Secondary infections: give antibiotic treatment (*see p.263*).
- Treat the fever with **paracetamol**
- Only in cases of severe itching, give PO **chlorpheniramine** 1-3 days.
- If lesions in the eye treat with an ointment such as **TEO**.

HERPES ZOSTER (SHINGLES)

DEFINITION

A rash caused by the reactivation of the chickenpox virus. It occurs to people that already had chickenpox. After you recover from chickenpox, some of the virus (*Varicella zoster*) stays in the body in the spinal cord. Sometimes the virus becomes active again and causes shingles. It may happen at any age, but frequently in patients with low immunity (*see HIV p.145*). More common in adults than children.

SIGNS AND SYMPTOMS

- Often fever and chills a few days before the rash develops. Feels unwell.
- Moderate to severe pain (like needles, sharp pain, numbness) on skin before rash develops.
- 4 or 5 days later the vesicles appear on a red base (similar to *Herpes simplex* but over a larger area).
- The vesicles become pustules, then crusts.
- The rash appears in the **area of the affected nerve (dermatome)**. **It is usually on one side**, very often on the chest but it can be anywhere on the skin or mucosa (depending on the affected nerve).

TREATMENT

- Same as for *Herpes simplex.*
- Apply cold compresses.
- Follow pain protocol (*see p.32*).
- Consider **amitriptyline** if pain is not improved by painkillers as it is very effective against nerve pain.
- If eye is affected or severe disease discuss with the doctor and consider referral. **Acyclovir** can help if available, but only if start in the first 48 hrs after symptoms (lesions) onset.

Mild or moderate infections:

- No antiviral treatment is needed and supportive care is enough

Severe cases with necrotic lesions or extensive lesions or in the face spreading to the eye:

- Oral **acyclovir**, if available, 200mg 5 times/day for ≥5 days, **start in first 48 hrs** after symptom onset.

The patient with shingles is infectious to people who have not had chicken pox.
This is especially important for contact with pregnant women – **counsel them to stay away from pregnant women who never had chickenpox**.

25.4 PARASITIC SKIN INFECTIONS

25.4.1. SCABIES

For photo, *see Appendix 1*

DEFINITION

Scabies is a parasitic infection of the skin. It is common in this region and spreads easily. Transmission is by close direct contact. The mite invades into the skin causing an inflammatory reaction.

SIGNS AND SYMPTOMS

- Itching (especially at night).
- Small sores, scratch marks and burrows (tunnels under the skin); especially between the fingers and toes, around the wrists, axilla or groin and other places.
- The back and face are not affected.
- Other members in the family may have it too. If suspect in child examine the mother, especially her hands. Scabies lasts for weeks to months. The sores can become infected: If there are any sign of infection treat with antibiotics first and then the scabies.

Note: There is a severe form of scabies called Norwegian scabies, which is thick, scaly, red plaques which can look like psoriasis, 50% occur without itching.

TREATMENT

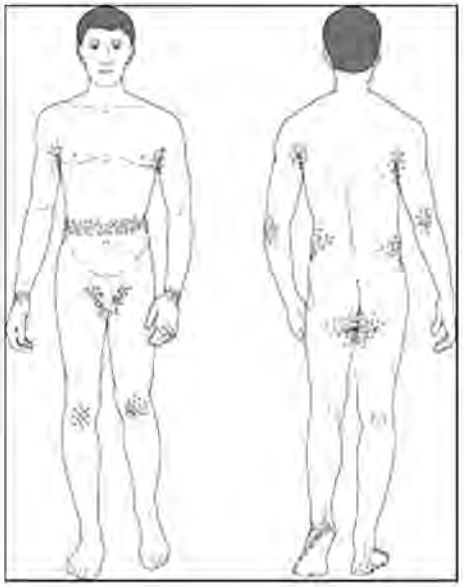
- Treat secondary infection first.
- Wash the whole body with water and soap.
- Treat all people in the family and close contacts **at the same time**.
- Medication: Ideally use **permethrin** as have to apply for less time, only need to apply once, and does not need diluted in children.

5% Permethrin lotion for child >2mo and adults (does not need dilution). One application, apply to whole body except face/mucous membranes, Allow to dry and then put on clean clothes. Do not wash for at least 8 hours. (It may be easier to apply permethrin in the evening to avoid washing.)

25% Benzyl benzoate Use for child <2mo or permethrin not available (needs dilution)

- *Child < 2 yrs* – 1 part 25% lotion + 3 parts water apply for 12 hrs (or if <6 mths for 6 hrs) then rinse
- *Child 2-12 yrs* – 1 part 25% lotion + 1 part water, apply for 24 hrs then rinse off
- *Child >12 yrs/adults* – undiluted 25% lotion, apply for 24 hrs then rinse off
- REPEAT application after 24hrs

Figure 25.1 Distribution of scabies rash on the body



- Cut fingernails and apply lotion under the nails.
- Wash the clothes and bedding for the whole family with boiled water and soap and then dry in the sun. If cannot wash, expose to the sun for 3 days, ideally in a completely closed clear plastic bag.
- Counsel patients that the itching may continue for several weeks. This is a reaction to the dead parasite. **Calamine lotion** may be needed.
- For severe cases (Norwegian scabies) refer to hospital as the patient needs isolation

If no response after treatment make sure that the treatment has been applied properly, all members of the family have been treated, and clothes and bedding have been cleaned properly.

25.4.2. CUTANEOUS LARVA MIGRANS (HOOKWORM)

For photo, *see Appendix 1*

DEFINITION

The disease is caused by the larvae of animal hookworms. Eggs are found in dog or cat faeces on the ground. Humans walking bare foot or lying on the sand can become infected by larval invasion through intact skin. The larvae travel under the skin leaving a red irregular tract, most often on the feet.

SIGNS AND SYMPTOMS

- Very itchy red tracks on the skin. The larvae travel a few millimetres each day.
- Foot and ankle are the most common sites.
- The larvae can survive for weeks before they die.

DIAGNOSIS

Hookworm eggs may be found in stool examination.

TREATMENT

- Albendazole **Adult/Child >6m**: 400mg STAT
  if >6mo but <10kg give 200mg STAT
- *See Worm treatment table, p.122*

PREVENTION

- Wearing shoes or sandals.

25.4.3. LARVA CURRENS (STRONGYLOIDES)

For photo, *see Appendix 1*

DEFINITION

The disease is caused by migrating *Strongyloides stercoralis* larvae. The worm enters the body by making a hole in the skin and then moves around the body causing a rash.

SIGNS AND SYMPTOMS

Acute strongyloides

- The area around where the worm entered the body may have redness and itching and last for up to a few weeks.
- May also get pulmonary symptoms (dry cough, dyspnoea, wheeze) if the worm travels to the lungs.
- Once larvae get to the intestine they can cause GI symptoms e.g. bloating, abdominal/epigastric pain, vomiting, diarrhoea.

Chronic strongyloides

- Intestinal larvae may re-infect their host (auto-infection) by penetrating through the intestinal wall or from the skin around the anus.
- Chronic infections lead to recurrent pulmonary and GI symptoms.
- When the worm moves around the body it causes itchy red tracks on the skin between the neck and knees that last for several hours to days. The worm/rash moves 5-10cm per hour and the rash comes and goes. This rash is called **larva currens**.

DIAGNOSIS

- Larvae may be detected in a stool examination.

TREATMENT

First line:	Ivermectin	if available
Second line:	Albendazole	Adult/Child >6m: 400mg OD for 3 days. if >6m but <10kg give 200mg OD)

- *See Worm treatment table, p.122*

PREVENTION

Wearing shoes or sandals.

25.5 NON-INFECTIVE SKIN RASH

25.5.1. URTICARIA (ALLERGIC RASH)

For photo, *see Appendix 1*

DEFINITION

Allergic skin reaction. Often it is impossible to find the cause of the allergy, but common causes are:
Medication: If the patient is under a new treatment (e.g. quinine, amoxicillin, co-trimoxazole).
Insect bites, cat hair, worms, colouring in drinks, contact with plants/metals, food, pesticides.

SIGNS AND SYMPTOMS

- A raised, oedematous, red rash that changes quickly in size and shape (within minutes) on the whole body. Swellings are transient (they persist only for minutes - maximum 24 hours). Very itchy.

TREATMENT

- Cool down with water.
- Remove the cause: stop new medication, stop contact with plants, metals, foods etc.
- Cut fingernails to prevent scratching which can lead to infection.
- If severe itching: give **chlorpheniramine** until itching stops.

In case of oedema of the face or difficulty breathing or wheeze follow DRS ABCDE anaphylactic shock protocol, *see p.16*.

25.5.2. ECZEMA

For photo, *see Appendix 1*

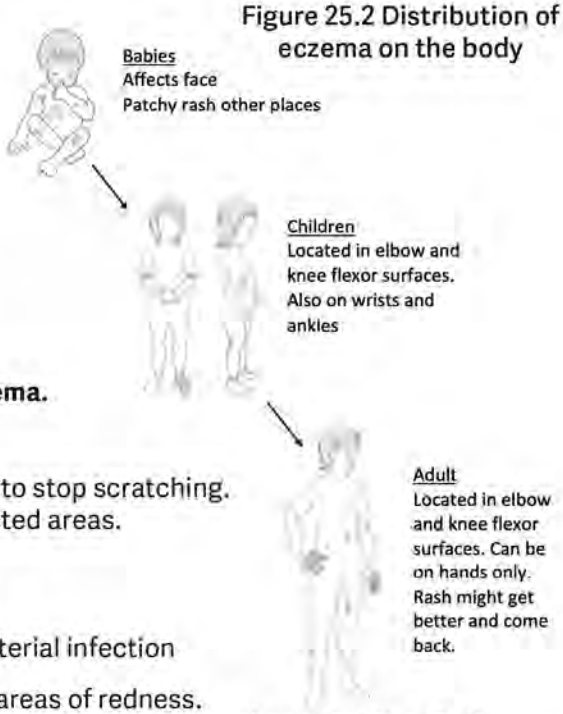
DEFINITION
Non-specific inflammatory skin reaction to special factors (depends on the patient).

SIGNS AND SYMPTOMS

- Red, scaly/dry, itchy lesion
- Usually on both sides of the body (especially front of elbows and behind knees (flexure areas).
- Localised or widespread, dry or wet, chronic.
- Dry lesions are very itchy and there is serous (like water) exudation, there may be vesicles.
- Appear and disappear at the same place.
- Chronic thickening of the skin (lichenification)
- Secondary infections are common.
- Can look similar to ringworm, especially the face.

If infected, treat with antibiotics first and then the eczema.

Figure 25.2 Distribution of eczema on the body



TREATMENT

- **Do not scratch**; use socks on the hands when sleep to stop scratching.
- Wash skin only with water: do not use soap on affected areas.
- **Do not scrub**.
- Wear cotton clothing or clothes that can 'breathe'.
- **Rinse clothes very well, so that no soap stays on.**
- Treat other skin disease e.g. scabies, secondary bacterial infection

1. **Mild**: areas of dry skin sometimes itchy, may have small areas of redness.
   - **Vaseline**/white soft paraffin apply QID (advise to protect skin from sun when using Vaseline) +/- **chlorpheniramine** oral if very itchy.
2. **Moderate**: dry skin, red patches with scratch marks, may have small areas of skin thickening.
   - **Vaseline**/white soft paraffin apply QID (protect skin from sun when using vaseline) or use before bedtime and cover the skin (e.g. long pants, shirt, socks on feet and hands) to keep in the moisture +/- **chlorpheniramine** oral if very itchy
   - **Hydrocortisone 1% cream (mild steroid)**
     - **Note**: if there is bacterial infection, treat bacterial infection first.
     - Apply small amount at night for 1 week, increase to BID if not improved.
     - Always use for shortest time possible, once improved stop or decrease.
     - Avoid any areas of broken skin.
     - If need to use for long time then try to apply on alternate days or weekly.
3. **Severe**: large areas of dry skin, constant itching, red, may be bleeding/weeping/infected, large areas of thickened skin.
   - **Triamcinolone (moderate steroid)**. When improve, decrease to Moderate treatment.
     - Apply small amount BID
     - Always use for the shortest time possible, once improved decrease to hydrocortisone BD
     - Consider betamethasone (high strength steroid) if not improved with triamcinolone.
     - Avoid face, eyes, axillae and genital areas because the skin is very thin
   - If very severe and above treatment doesn't work can consider PO **prednisolone** 0.5mg/kg/day.

Steroid creams have different strengths: **hydrocortisone** (mild), **triamcinolone** (moderate), **betamethasone** (high). Moderate or high strength steroid creams can damage the skin if used for long time. Use the weakest cream that you can for the shortest time possible.

COMPLICATION

Eczema herpeticum

Is a serious skin infection with herpes virus mostly seen as a complication of eczema

- Localised eruption of blisters with crusting. Systemically unwell with fever.
- Treat with **acyclovir** PO 200mg (100mg if <2yrs old) 5 times per day for 10 days.
- If immunocompromised e.g. HIV give double dose of acyclovir.

25.5.3. PSORIASIS

For photo, see Appendix 1

DEFINITION
A chronic inflammatory skin condition that produces thick scaly skin.

SIGNS AND SYMPTOMS
- Skin: chronic scaly pink lesions on extensor surfaces e.g. front of knees, behind elbows, scalp, trunk, sometimes itchy.
- Nails: pits in nails, yellow colour.
- Joints: can get swollen joints, especially hands and feet (psoriatic arthritis).

There are many different types of psoriasis. Two most common types are:
- ***Plaque psoriasis***: lesions on extensor surfaces.
- **Guttate psoriasis**: multiple 1-10mm lesions small scaly lesions (like tear drops) mainly on trunk, upper arms and thighs.

TREATMENT
1. Stop smoking, avoid alcohol and decrease weight if overweight
2. Expose skin to sunlight
3. Apply **Vaseline** QID
4. If not improving or acute episode, use **hydrocortisone** cream. (see eczema treatment for caution about topical steroids).
5. Give **NSAIDs** +/- omeprazole for stomach protection in cases of arthritis.
6. For very thickened skin lesions try Whitfield ointment twice a week – but stop if getting worse.

25.6 LEPROSY

For photo, see Appendix 1

Leprosy can look like many other skin conditions, some nerve and bone and eye conditions

DEFINITION
Leprosy is caused by a bacteria, *Mycobacterium leprae*. If treatment is not given, smear positive patients can spread the bacteria from their noses into the air. Risk of infection from air is not very high. Touching the skin of a person with leprosy does NOT cause infection. Almost all properly treated patients are NOT infectious. Most people do NOT get leprosy illness even if they are in contact with the bacteria.

Think of leprosy when you have a patient with:
- One or more skin patches that is:
  - Pale or discoloured (reddish or copper-brown colour)
  - Do not itch
  - Lasts for 6 weeks or more
  - Does not look like one of the common skin conditions
  - Does not improve with other treatment.
- **Skin changes AND nerve signs**. Pale or discoloured skin lesion, decreased sensation and an enlarged nerve is likely to be leprosy.

Leprosy should be considered in all patients with painless injuries, burn wounds or ulceration of the hands or feet.

SIGNS AND SYMPTOMS

Skin Maculae (flat), often pale centre with raised red edges. Papules (raised, solid, rounded), often red. Plaques (raised, spread), often red.

Nerves Enlargement of peripheral nerves in legs, arms, neck or head outside brain. Peripheral nerve pain, nerve tenderness, reduced skin feeling, weakness or loss of muscle strength (claw hand, wrist drop, foot drop, facial palsy), muscle wasting.

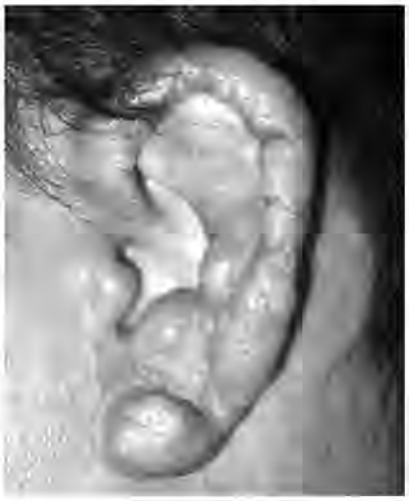
Eyes Loss of feeling on conjunctiva (front surface of eye). The patient cannot close the eye (lagophthalmos), the lower eyelid turns out (ectropion). Eyebrow loss, eyelashes thin and turn in (entropion). Dry eyes, conjunctivitis, corneal damage, iritis (inflammation of the iris), blindness.

If your area has a leprosy control programme,
refer any suspected patient for diagnosis and management.

History

Short duration (≤3 wks) and itching make the diagnosis less likely.

Figure 25.3 Leprosy nodules on aurical and pinna



Physical examination

1. Check the **whole body,** in a good light, for abnormal patches of skin.
   - colour change, dryness, thicker than normal, loss of hair
2. Check nerves for enlargement (can see or palpate nerve):
   - Ulnar - inside and slightly above the elbow in the ulnar groove (keep arm bent).
   - Median - in front of the elbow and in front of wrist.
   - Radial - at the distal radius, on the thumb side above the wrist.
   - Peroneal (lateral popliteal) - behind the fibula at the outside of the knee (knee bent)
   - Tibial - behind the medial malleolus at the inside of the ankle.
   - Posterior auricular - below and behind the ear, turn the neck.
   - Cutaneous nerves near to a skin patch.
3. Check for **sensation** by testing the centre of skin lesions for loss of 'light touch' feeling using a piece of cotton wool or paper. Also for pain with a common pin (pinprick) and temperature sensation loss. Loss of sensation suggests leprosy. 'Light touch' feeling is lost before pain sensation.
4. Check **cornea** (trigeminal nerve) for loss of touch sensation, using cotton wool.
5. Check muscles of the feet, hands and face for **weakness** and for loss of muscle

**If suspect a patient has leprosy – discuss with a doctor (e.g. TB),
the patient may need referral to a leprosy programme for diagnosis and treatment**

DIAGNOSIS

Diagnosis is confirmed by finding the bacteria in:

- Split skin smear test- skin scraping from 2-4 affected and 2 normal areas of skin (e.g. ear). Sent on a slide for Ziehl Neelsen (ZN) and AFB testing. This is usually done in specialist clinics/hospitals.
- Nasal swab

If test results are negative, a patient can still have leprosy. In these cases use complete clinical examination to make the diagnosis.

TREATMENT (if not available, refer for treatment)

1. Medical treatment with drugs is the best way to help patients with leprosy.
2. It is easy to treat the infection, but nerve damage will never go away. It is important to diagnose and start treatment early, to prevent nerve damage.
3. **Early recognition and effective treatment can prevent deformity and disability.**
4. Multiple drug treatment (MDT) is used for leprosy in order to prevent development of drug resistance.
5. Counsel the patient to:
   - Take the drugs regularly as prescribed
   - Take correct doses
   - Finish all treatment until finished
   - Finishing treatment. This prevents drug resistance and relapse (disease comes back).
6. Treatment regimen varies depending on the clinical staging of the disease (by WHO).
   See Figure 25.4 next page.

Figure 25.4 WHO staging for leprosy

Stage	Characteristics	Treatment regimen (dosage for adult)
Multibacillary leprosy	> 5 skin lesions	**Rifampicin** 600mg once/month x 12 months AND **Clofazamine** 50mg OD daily + 300mg once/month x 12 months
Paucibacillary leprosy	2-5 skin lesions	**Rifampicin** 600mg once/month x 6 months AND **Dapsone** 100mg OD daily x 6 months
Single skin lesion paucibacillary leprosy	Single skin lesion	**Rifampicin** 600mg STAT AND **Ofloxacin** 400mg STAT AND **Minocycline** 100mg STAT (single dose of each)

Drug side-effects:

Dapsone	Haemolytic anaemia; Check G6PD before giving; Avoid in G6PD deficiency. Skin rash or skin reaction, sometimes severe.
Clofazimine	Dry skin or becomes reddish /brown. Improves after treatment is finished. Use Vaseline (or vegetable oil) for skin dryness.
Rifampicin	Urine becomes red color. This does not cause any harm.
Ethionamide	Alternative to clofazimine. May cause liver problems.
Prothionamide	Same as for ethionamide

Acute medical emergencies in leprosy:

1. **Severe reaction with sudden onset**, usually when on treatment, from stronger immunity reaction causing new nerve or skin damage and presenting with:
   - rapid nerve swelling with pain and tenderness.
   - sudden loss of motor function (wrist drop, foot drop, facial palsy).
   - old skin lesions becoming painful, tender, may ulcerate.

   TREATMENT: **prednisolone** in high dose (adult 1mg/kg/day) for 3-5 days then decrease the dose every week (decrease by 5mg/day each week) over 3 to 4 months. Continue anti-leprosy treatment.

2. **Severe reaction in an inadequately treated patient**, from weakener immunity, with increased new skin lesions and old lesions to look more like leprosy (uniform, thick, extensive, nodular).
   TREATMENT: Restart **anti-leprosy drugs** in proper dosage and use **prednisolone**

PREVENTION

Protect feet, hands and eyes because they have lost sensation and cannot feel trauma.

- Use shoes with strong bottom (like car tyre rubber) to protect against trauma from walking.
- Gloves can protect hands when working and cooking.
- Plain glasses or goggles can help to protect eyes.
- Joint stiffness can be prevented by gentle rotation of affected joints every day.

EDUCATION

Counsel how to prevent injury to numb areas. Rest is the best, but is often not possible. Every day, check the numb areas for trauma. Some to the clinic if there is any wound. Be careful to avoid burns.

REHABILITATION

Surgery and physiotherapy are important to manage ulcers, bone and muscle deformities of the hands, feet and face. Surgery (for deformed muscles and limbs) and drugs (for infection) cannot improve lost sensation. NGOs such as Handicap International may be able to help, consider referral.

IMPORTANT POINTS FOR LEPROSY

- Early detection, and treatment of the disease.
- Early recognition and adequate treatment of complications.
- Patient education in self-care.

Note: Many people with leprosy become depressed by how they are treated by other people. Be aware of the patient's feelings. It is also important to educate the community about the disease because it is easy to treat and not so infectious. This can help the community to accept leprosy patients.

25.7 WOUNDS

DEFINITION
A wound is a break in the skin that can be caused by many different things e.g. cut, bite, surgical wound etc.

TREATMENT
For every wound follow these steps to treat the wound. For more detail of each step see below.

- Always take **general precautions** for you and the patient e.g. gloves,
- **Remove** any old dressing
- **Examine** the wound
- **Clean** the wound with polyvidone iodine solution and sterile water or normal saline and rinse.
- **Explore** the wound. Use local anaesthetic 1% lidocaine, wait for 2 min, then look for foreign bodies.
- **Tetanus prevention**
- **Assess** for sensation, function and blood supply to the limb
- **Excise** old tissue from the wound – remove non-viable tissue
- **Suture** – consider immediate or delayed suturing
- **Dressing**
- Consider **complications**

1. General precautions
   - Explain the procedure to the patient
   - Wear protective equipment, *see p.6*
   - Have someone to help you
   - Sterilise equipment between patients
   - Go from clean to dirty e.g. if multiple wounds start with the cleaner wounds
   - Use painkillers before exam, give it time to work
   - Discard of all sharps in the sharps containers
   - Delay suturing if wound >6h old or contaminated
   - Give **Tetanus prevention care** (*see below*)
   - Consider **referring deep severe wounds or wounds that cover large areas.**

2. **Remove old dressing**
   - Wash hands or disinfect with alcohol rub.
   - Use non-sterile gloves, remove the tape/bandage.
   - If the last bandage/gauze is stuck to the wound loosen with NSS or sterile water before removing.
   - Look at the gauze, if there is lots of discharge/green colour/smells bad then suspect a wound infection and consider starting antibiotics (*see p.262 and 263*).
   - Discard the dressing and non-sterile gloves in the correct place.

3. **Examine the wound**
   Look at the wound colour
   - Necrosis, wet or dry infected eschar (dark red old blood may look like necrosis).
   - Yellow/green area = infected tissue/pus.
   - Red area = granulation – usually a sign of healing (but red edges = inflammation or infection). If granulation tissue is higher than the normal skin, use moderate pressure dressing to push down the granulation tissue, so normal skin can to grow over the wound.
   - Pink area = epithelisation, final stages of wound healing.

   Look for infection
   - Red, indurated and painful edges.
   - Drainage of pus between the sutures by itself or when pressure applied.
   - Lymphangitis or subcutaneous crepitations around the wound.
   - If the wound is sutured and there is infection, remove some (or all) sutures to help healing.
   - If you think the wound is infected (or it is a high risk wound (*see below*) treat with **cloxacillin** (*see cellulitis p.263*). **Note:** in immunosuppression e.g. diabetes, kidney failure, HIV etc. healing can be delayed. Treat with antibiotics for a longer time if there is a slowly healing infection.

4. **Clean the wound**
   - Wash hands again/disinfect with alcohol rub. Use non-sterile gloves.
   - Clean according to what the wound looks like:
   - A clean sutured or open wound: use NSS to remove any dirt, work from the cleanest to the dirtiest area, use new swabs for each stroke, dab dry with sterile gauze.
   - A necrotic or infected open wound: clean with polyvidone iodine (7.5% scrub 1 part solution + 4 parts of NSS). Rinse thoroughly with normal saline then dab dry with sterile gauze.

5. **Explore the wound**
   - If the wound is not clean and you are worried that there may be a foreign body inside use local anaesthetic 1% **lidocaine** and wait for 2 minutes, explore the wound to look for foreign bodies.

6. **Consider Tetanus Prevention**
   - If high risk wound: deep wounds, war wounds, wounds with bone fractures, wounds with devitalized (dead, necrotic) tissue, extensive burns, foreign body; wounds older than 6 hours inject tetanus immunoglobulin around the wound (*see below*).

7. **Assess for sensation, function and blood supply to the limb**
   - Can the patient still move and feel the affected area? Is the skin pink, not cold, cap refill <2 sec?
   - I If the wound is severe the limb may need amputation so consider referral.

8. **Excise the wound**
   - Remove any non-viable tissue carefully using sterile equipment.

9. **Suture the wound** (if necessary)
   - Immediately suture: if the wound is clean, skin is normal, wound >6 hours old (or less than 24 hours old if on face, scalp, upper limbs, or hands).
   - Delay suture: if bite, bullet/shell/mine/shrapnel wound, if the skin has bruising or necrosis, if does not fit criteria for immediate suturing, do daily dressing change with cleaning and removal of necrotic tissue and consider suturing after 72 hours.

10. **Dressing the wound**
    - A clean sutured or open wound: re-cover a wound with sterile gauze and bandage.
    - A necrotic or infected open wounds: Apply sterile Vaseline and remove all necrotic tissue at each dressing change until the wound is clean.

11. **Consider complications**
    - Foreign body (from trauma or dressing) can delay healing and make the wound worse. If not healing, check for foreign bodies. May need to do incision to inspect deep wounds.
    - If granulation tissue grows too thick, the normal skin cannot close over the wound. Use skin grafting over the granulated tissue. If not available, you can use a pressure dressing (moderate pressure). This pushes down the granulation tissue and allows normal skin edges to grow over the wound. It may be many weeks of daily dressing changes until the wound is completely healed.

Figure 25.5 Tetanus prevention for wounds

RISK	**PATIENT VACCINATION COMPLETE** Last booster was:			**PATIENT VACCINATION NOT COMPLETE** (< 3 doses)
	< 5 years	**> 5 years**	**> 10 years**	
LOW *	None	None	Booster	Start or complete vaccination (full course of 5 doses)
HIGH **	Antibiotics	Antibiotics Booster	Antibiotics Serotherapy Booster	Antibiotics Serotherapy Start or complete vaccination

* Low risk wound: minor wounds, scratch.
** High risk wound: deep wounds, war wounds, wounds with bone fractures, wounds with devitalised tissue, extensive burns, foreign bodies, wounds older than 6 hours.

Antibiotics:
- **Cloxacillin**: Adult: 500mg QID; Child: 15mg/kg QID for 5 days
- If the wound was exposed to soil (e.g. wound on foot, bamboo/wood trauma) or not better on cloxacillin, ADD **ciprofloxacin**: Adult: 500mg BID; Child 7.5mg/kg BID x 5-7 days

Tetanus:
- **Tetanus toxoid vaccine** 0.5 ml IM into upper arm or buttock (booster or start full course)

Serotherapy:
- Adults and children: **Tetanus Immune Globulin (TIG) 250 units** IM STAT with part of the dose injected around the wound.
- If the injury occurred >24 hours ago, there is serious infection or after burns give **Tetanus Immune Globulin (TIG) 500 units** IM STAT.

Note: Inject the vaccine and the immunoglobulin in 2 different sites. Use separate syringes.

25.8 BURNS

DEFINITION
Burns are injuries to tissues caused by heat, friction, electricity, radiation or chemicals.

HISTORY
- When did the burn take place?
- What caused the burn? Electrical burns can cause more extensive damage than is first seen.
- What is the age of the patient? Burns are more severe in the very old and very young.
- Has there been any inhalation of hot smoke? Look for dyspnoea with chest wall indrawing, burned nose hairs or soot around the nose and mouth.

EXAMINATION
Severity of burns are evaluated on the basis of the **depth**, **location**, and **size** of the burn.

1. **Depth** of the burn:
   - Superficial burn: Red, dry and painful, it does not blister
   - Superficial partial thickness burn: Pink and moist blisters may be present
   - Deep partial thickness burn: White or mottled pink, with some painless areas
   - Full thickness burn: White, mottled or charred and are dry
   - **Note**: Patients with electrical burns need an ECG
2. **Location** of the burn:
   - Document in the IPD chart or lemma the location of the burn)
   - Burns are more severe when on the face, hands, joints and perineum.
3. **Size** of the burn:

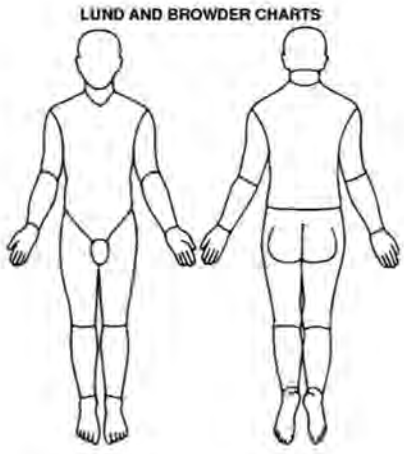
To calculate the amount of burned skin (% body surface area) use the following table:

Figure 25.6 Body surface area (BSA) percentage by age

Lund Browder table Percentage of body surface area according to age

Location	< 1 year	1-4 years	5-9 years	10-15 years	Adults
Head	19	17	13	10	7
Neck	2	2	2	2	2
Anterior trunk	13	13	13	13	13
Posterior trunk	13	13	13	13	13
Right buttock	2.5	2.5	2.5	2.5	2.5
Left buttock	2.5	2.5	2.5	2.5	2.5
Perineum/genitalia	1	1	1	1	1
Right upper arm	4	4	4	4	4
Left upper arm	4	4	4	4	4
Right lower arm	3	3	3	3	3
Left lower arm	3	3	3	3	3
Right hand	2.5	2.5	2.5	2.5	2.5
Left hand	2.5	2.5	2.5	2.5	2.5
Right thigh	5.5	6.5	8.5	8.5	9.5
Left thigh	5.5	6.5	8.5	8.5	9.5
Right leg	5	5	5.5	6	7
Left leg	5	5	5.5	6	7
Right foot	3.5	3.5	3.5	3.5	3.5
Left foot	3.5	3.5	3.5	3.5	3.5

Figure 25.7 Body surface area chart



For example:

2 year old with burn to right upper arm (=4%), right lower arm (=3%), and hand (=2.5%).

Total body surface = 4 + 3 + 2.5 = **9.5%**

CLASSIFICATION

Mild burn:

- Patient is in good condition
- No burns on face, neck hands, joints or perineum. Skin is intact (maybe with vesicles)
- Area: partial thickness less than 10% in children, 15% in adults; full thickness less than 2%

Severe burn (always admit to IPD):

- Burns on face, hands, neck joints or perineum
- Inhalation of hot smoke: burns on face, burnt nasal hairs, noisy breathing
- Electrical and chemical burns or burns from explosions
- Area: partial thickness more than 10% children or 15% adults; or full thickness burn
- Age <3yrs or >60yrs or significant co-morbidities e.g. epilepsy, malnutrition

TREATMENT OF SEVERE BURN

1. On admission

Note**: *For all unwell patients a full DRS AB-CABDE/S assessment and treatment (see p.13) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step

Figure 25.8 DRS ABCDE chart for burns

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR **SHOCK DUE TO BURNS**
DRS	Danger Response Send for help	Gloves Safe place Dall for help
A	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) **Oxygen** (high flow) **if any signs of smoke inhalation**
B	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	Position patient: If dyspnoea sit up right (but if very low BP raise legs to level above head)
C	HR, BP, Cap refill Urine output, Temp Listen to HS	**Put in 2 biggest (16G or 18G) IV cannula – take bloods e.g. Hct, CBC, MS, BC, dextrose etc.** **If signs of shock give fluid bolus RL (Ringer's Lactate)**
D	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	Give **analgesia** e.g. paracetamol, tramadol Give dextrose if low
E	AVPU/GCS Expose and examine all over body	Assess whole body for burns If chemical burn flush with lots of water for 15-30minutes Review notes and charts History, further investigations, treatment plan
DISCUSS WITH DOCTOR		
ASSESS RESPONSE – continue cycle with CABDE/S assessment		

Consider referral if burn is:

- >10% in size
- Involves the face, genitalia or joints
- Is all the way around a limb e.g. circle around the arm
- Electrical burn
- Signs of smoke inhalation
- Is associated with other trauma

2. Once patient is stabilised:

- Remove clothes that are not stuck to the burn.
- Take a history of the burn.
- Assess the burn using sterile gloves– extent, depth, location, associated injuries e.g. fractures.
- Use the table above to calculate the % of BSA affected.
- Keep patient warm with sterile/clean sheet.
- If burns >15% BSA or electrical burns or burns of perineum/genitalia insert a catheter.

3. Management in first 48 hours

Figure 25.9 Fluid resuscitation for burns

	Less than 12yrs	12 years or more
0-8 hrs	2ml/kg x % BSA of RL + maintenance fluid per hour for 8 hrs	2ml/kg x % BSA of RL
8-24 hrs	2ml/kg x % BSA of RL + maintenance fluid per hour for 16 hrs	2ml/kg x % BSA of RL
24-48 hrs	Daily maintenance IV minus oral fluids e.g. milk, clear soup (do not count drinking water)	40ml/kg RL minus oral fluids e.g. milk, clear soup (do not count drinking water)

RL = Ringer Lactate
Maintenance Fluid = alternate RL and D5W

Nutrition
- Start feeding at or before 8 hours.
- If BSA is >20% need high energy foods.

Antibiotics
- Only give antibiotics if there are signs of infection.
- Use precautions against infection e.g. good hygiene, careful wound management.

Tetanus immunization/prophylaxis

Physiotherapy
- Advise the patient/family that need to move the affected limb as much as pain allows to prevent contractions (thick scarring of skin near joints) and disability in the future. This is most important when burns cover joints (e.g. fingers, wrist, shoulder, knees, toes). If possible, refer to organisations e.g. Handicap International.

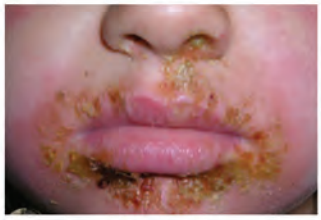
4. Local treatment
- Ensure sterile technique at all times when possible.
- Ensure adequate analgesia or sedation e.g. ketamine, diazepam
- Clean the burn with polyvidone iodine scrub solution (1 volume 7.5% solution mixed with 4 volumes of NSS).
- Remove any blisters with forceps and scissors.
- Rinse with NSS and dry the skin with sterile gauze.
- Apply silver sulfadiazine (or cetrimide cream) (avoid antibiotic creams) if available.
- Apply a greasy dressing or gauze with sterile Vaseline over the wound, cut the gauze to the exact size of the wound.
- Cover with sterile gauze and a loose bandage - be careful: if the bandage is too tight it can stop the blood supply to the limb.
- Try to keep the limb raised.
- Dress every 48hours or every day if infected or in certain areas e.g. perineum – assess for signs of ischaemia e.g. cyanosis, pale extremity, slow cap refill, no sensation.
- Monitor every day for pain, bleeding, healing and infection.

APPENDICES

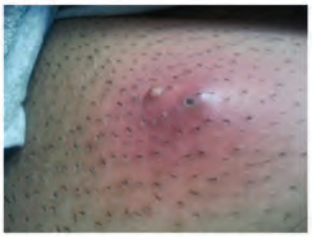
Appendix No.	Title
Appendix 1	Diseases in coloured pictures*update
Appendix 2	Thailand and Myanmar vaccine schedules 2019*new
Appendix 3	Trachoma grading card
Appendix 4	Family planning guide*update – flowsheet, version 2, 04 Dec 2019
Appendix 5	GBV pocket guide (Burmese language)*new
Appendix 6	GBV SMRU guide*new – flowsheet, version 6_5, 03 Jan 2020
Appendix 7	Surveillance outbreak management
Appendix 8	How to make ORS
Appendix 9	IV fluid table, version 1, 19 Feb 2014
Appendix 10	UTI management in children < 3 years old*update, updated 5 Nov 2019
Appendix 11	BP medication aid*new (use if more expensive BP drugs are available)
Appendix 12a	Paediatric blood pressure tables for boys*new (Sep 2017) (Flynn JT, Kaelber DC, Baker-Smith CM, et al. Clinical practice guideline for screening and management of high blood pressure in children and adolescents. Pediatrics. 2017 Sep 1;140(3):e20171904)
Appendix 12b	Paediatric blood pressure tables for girls*new (Sep 2017)
Appendix 13	Management of haemolysis SOP*update, version 18 Nov 2019
Appendix 14	IV iron treatment protocol*new
Appendix 15	Management of the febrile infant, version Nov 2010
Appendix 16	Management of meningitis in children*update, version 5 Nov 2019
Appendix 17	Antibiotic classes*new
Appendix 18	WHO growth charts for boys and girls (2007)
Appendix 19	Oxygen weaning guidelines*update, version 1, 17 Mar 2020
Appendix 20	SMRU PMTCT Guidelines*update, 7th Edition

Appendix 1. Diseases in pictures

SKIN DISEASE



IMPETIGO



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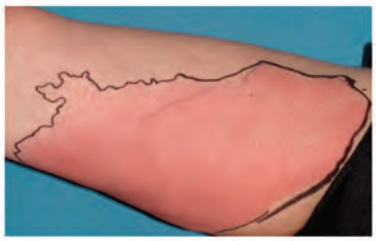
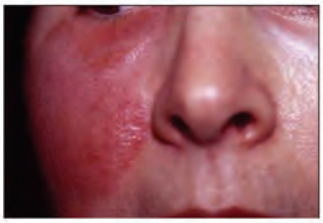


CELLULITIS



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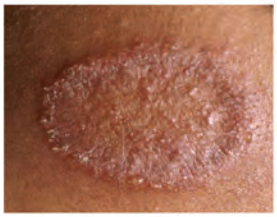
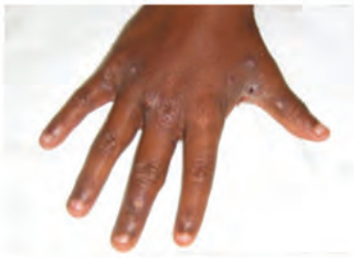


RINGWORM



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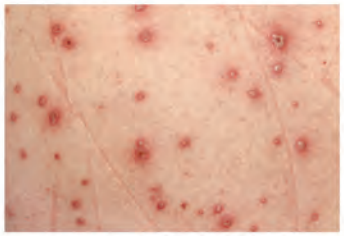
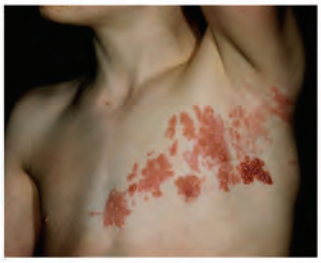


CHICKENPOX



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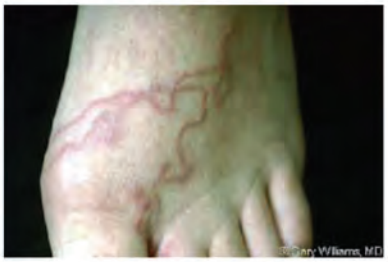
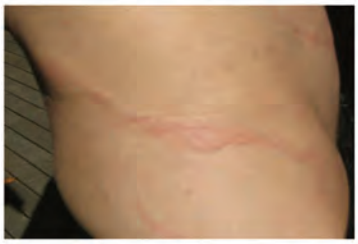
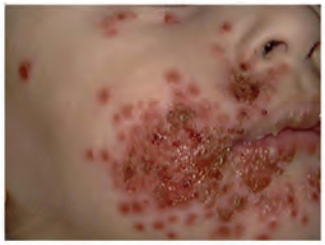


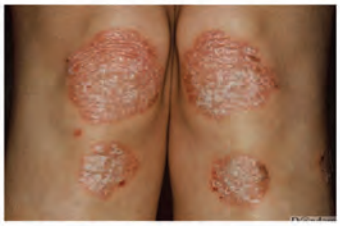
CUTANEOUS LARVA MIGRANS (ANIMAL HOOKWORK)



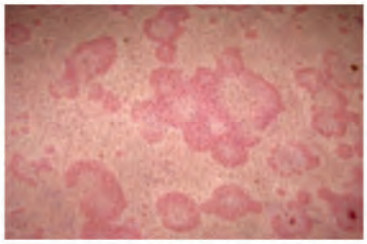
LARVA CURRENS



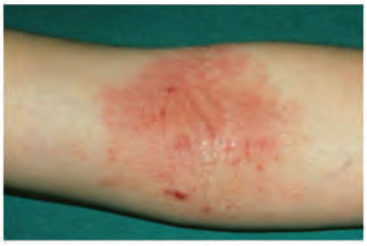
ECZEMA HERPETICUM



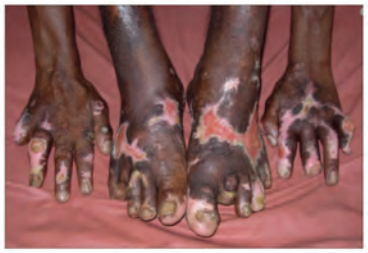
PSORIASIS



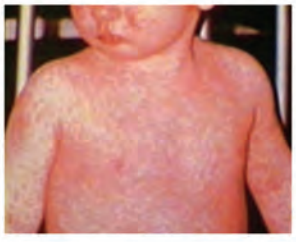
URTICARIAL RASH

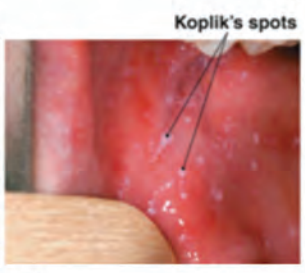


ECZEMA

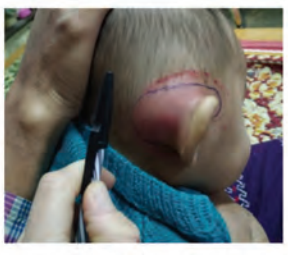


LEPROSY





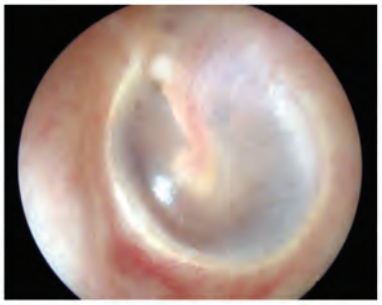
MEASLES



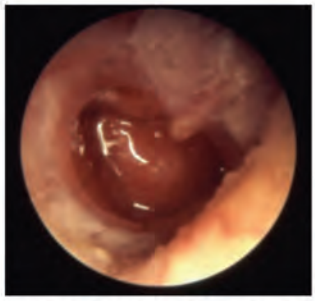
MASTOIDITIS

Appendix 1. Diseases in pictures

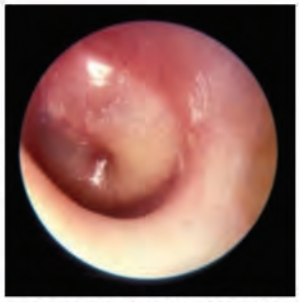
EAR DISEASE



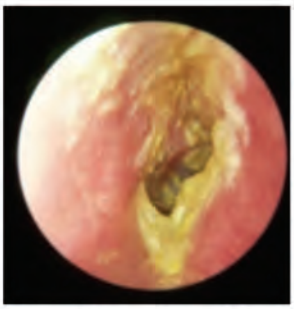
NORMAL EAR DRUM



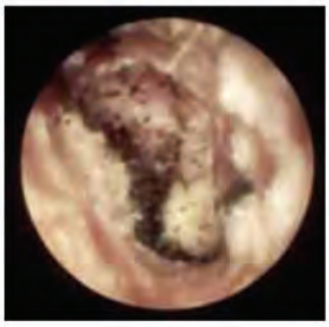
CHRONIC (SUPPURATIVE) OTITIS MEDIA



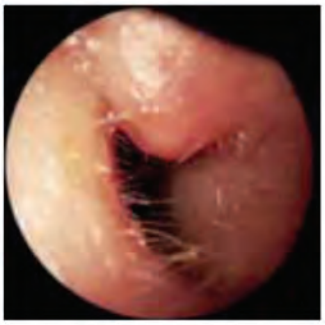
ACUTE OTITIS MEDIA



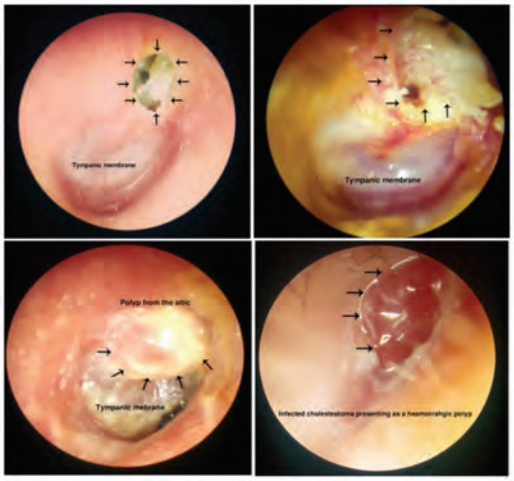
OTITIS EXTERNA



FUNGAL OTITS EXTERNA

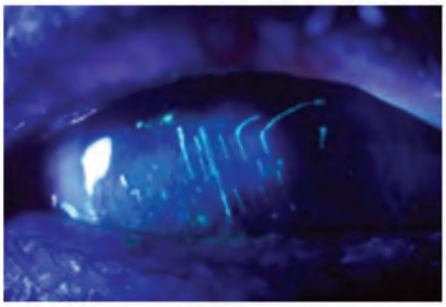


LOCALISED OTITIS EXTERNA

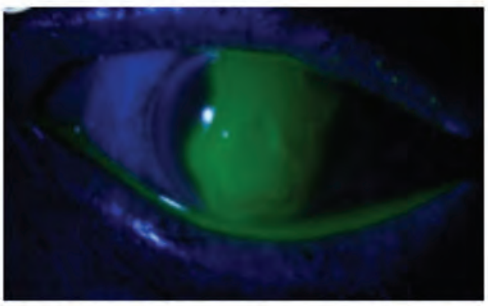


CHOLESTEATOMA

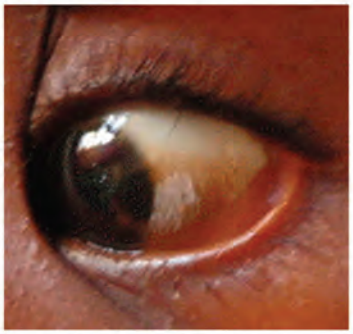
EYE DISEASE



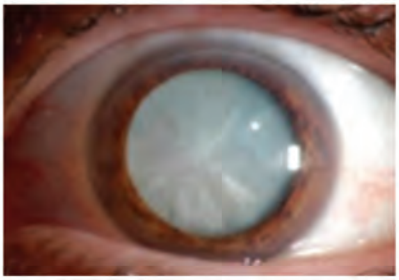
CORNEAL ABRASION - seen with fluorescein dye



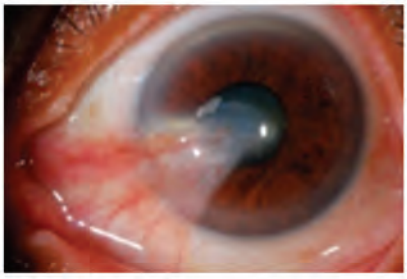
CORNEAL ULCER - seen with fluorescein dye



BITOT'S SPOT



CATARACT – can be removed with surgery. In newborns, surgery should be done within 2 weeks after birth or will cause blindness.

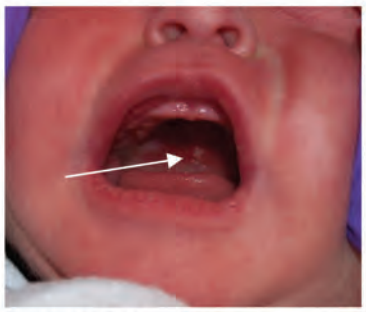


PTERYGIUM – extra tissue growth from sun damage. Only causes problem if extends onto the pupil. Prevent with sunglasses.

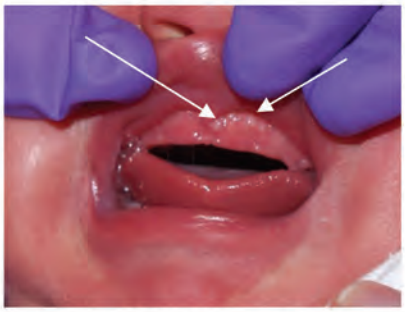
CONJUNCTIVITIS

Appendix 1. Diseases in pictures

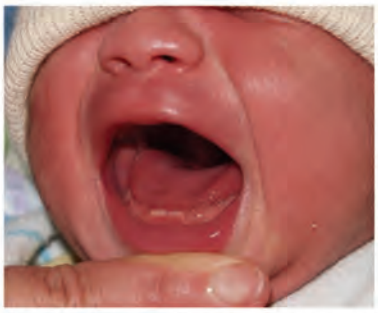
NORMAL VARIATIONS IN THE ORAL CAVITY



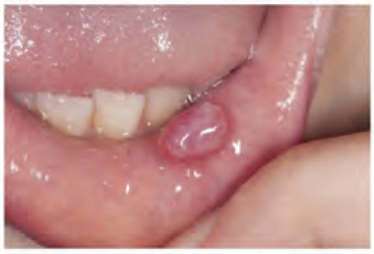
EPSTEIN PEARL – single or grouped white lesions on midline palate.



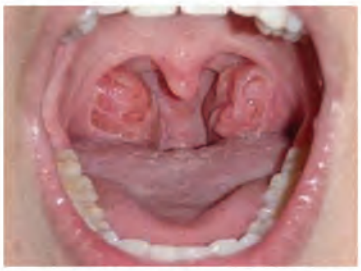
BOHN'S NODULES – white nodule on the upper gum.



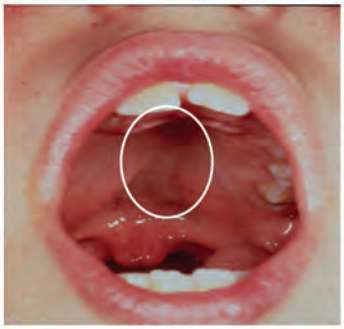
NATAL TEETH – usually normal. Do not remove.
(https://med.stanford.edu/newborns/professional-education/photo-gallery/mouth.html)



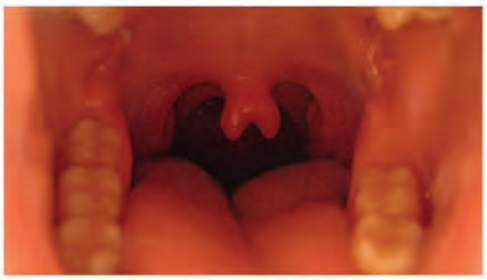
MUCOCELE – benign mucosal lesion. May resolve by itself. Can refer to dentist if needed.
(https://www.merckmanuals.com/professional/multimedia/image/v37570714)



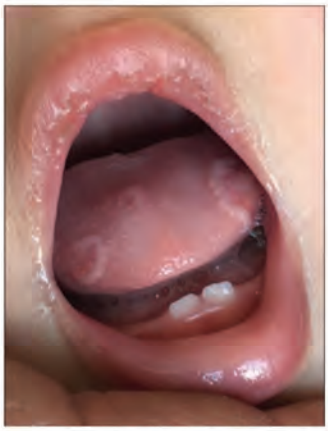
CRYPTIC TONSILS – holes in the tonsils. This is normal. Sometimes food or other material can get stuck inside.
(https://healthool.com/holes-crypts-in-tonsils/)

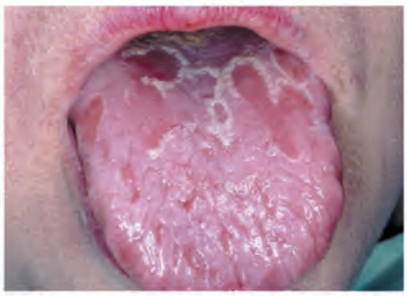


SUBMUCOSAL CLEFT PALATE - located in the soft palate.
(https://www.nationwidechildrens.org/family-resources-education/700childrens/2018/05/submucous-cleft-palate)



BIFID UVULA – Can be sign of submucosal cleft palate, so should palpate the soft palate. Surgical treatment only needed if eating or speech are affected. (https://www.healthline.com/health/bifid-uvula)

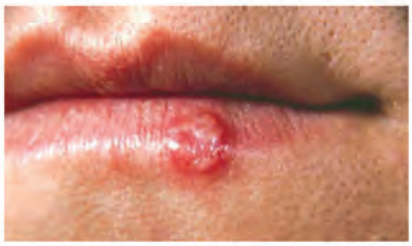




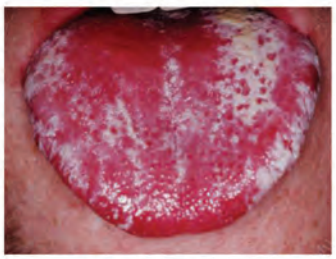
GEOGRAPHIC TONGUE – most commonly is hereditary.
(Thakur S, Gupta M, Tegta GR, Verma K. Indian Journal of Paediatric Dermatology. 2018 Apr 1;19(2):130.)

Appendix 1. Diseases in pictures

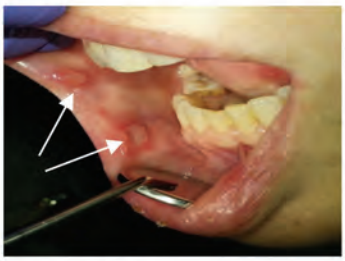
ABNORMALITIES OF THE MOUTH AND NECK



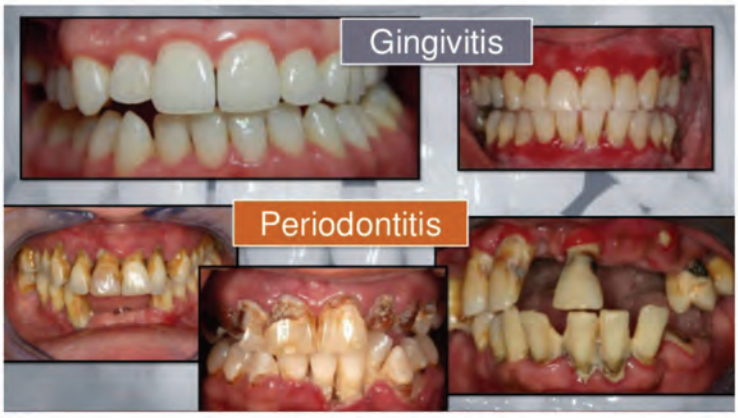
HERPES SIMPLEX



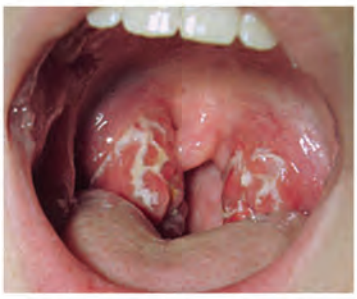
ORAL CANDIDA



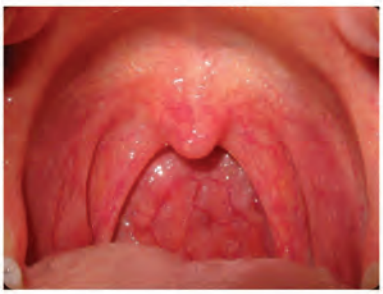
APTHOUS ULCERS
(https://emedicine.medscape.com/article/867080-overview)



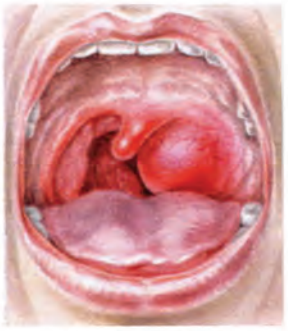
GINGIVITIS AND PERIODONTITIS



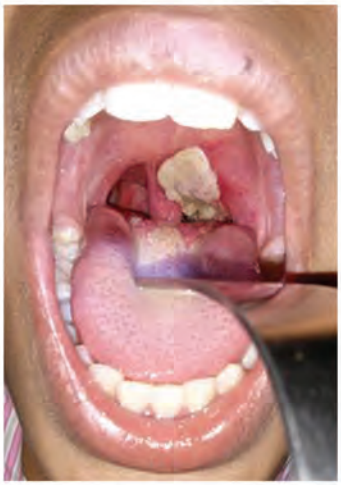
BACTERIAL TONSILLITIS



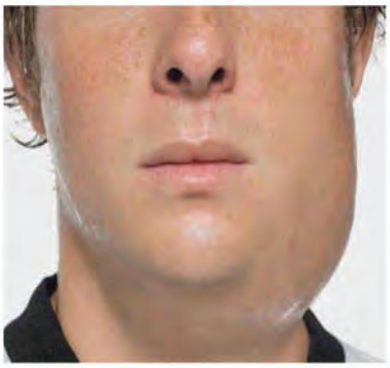
VIRAL PHARYNGITIS

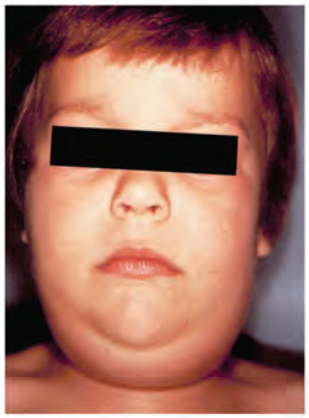


PERI TONSILLAR ABSCESS
with displaced uvula



DIPTHERIA – with typical grey membrane typical





MUMPS – https://www.advanceer.com/resources/blog/2017/april/dallas-sees-outbreak-of-mumps/ and https://doctorlib.info/infectiology/infections-central-nervous-system/17.html (original photo from CDC)

Appendix 2. Local vaccination schedules for infants and children

THAILAND Paediatric vaccine schedule 2018 or latest available (adapted from WHO)*

Vaccine	Schedule	Notes
BCG	birth	
HepB (paediatric)	Birth, 1 mo	Dose at 1 mo given only if mother is an HB carrier
DTwP / Hep B	2, 4, 6 mo	
DTwP	18 mo, 4yo	
Td	Every 10 years after 4yo	
OPV	2, 4, 6, 18 mo, 4yo	
MMR	9mo, 2.5yo	
JEV (live attenuated)	1yr, 2.5yo	
Rotavirus	2, 4, 6mo	Start in Feb 2020 as part of routine vaccines
HPV	11 yo, repeat in 6 months	Pilot phase
Influenza (paediatric)	6mo-2yo, repeat annually	Additionally, for children with chronic disease

*Accessed on 4 Nov 2019, at
http://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=THA

MYANMAR Paediatric vaccine schedule 2018 or latest available (adapted from WHO)*

Vaccine	Schedule	Notes
BCG	Birth-2mo	
HepB (paediatric)	Birth	
DTwP / HIB / Hep B	2, 4, 6 mo	
OPV	2, 4, 6 mo	
MR	9mo, 18mo	
JEV (live attenuated)	9mo	
Pneumococcal (conjugated)	2, 4, 6 mo	

* Accessed on 4 Nov 2019, at
http://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=MMR

If you have questions, please ask the **vaccine team on site. They can answer some questions** (e.g. what if the child lives with someone who is immunosuppressed? How to give BCG in the older child?) and **give updates** (new vaccinations or new vaccine schedule).

Do not give prophylactic **paracetamol** to the infant or family. You may give paracetamol if the parent asks or if the patient lives very far away. You should also give counseling to bring the infant to clinic if there is prolonged or very high fever. It may not be from the vaccination. Do not give paracetamol for low grade fever after vaccination.

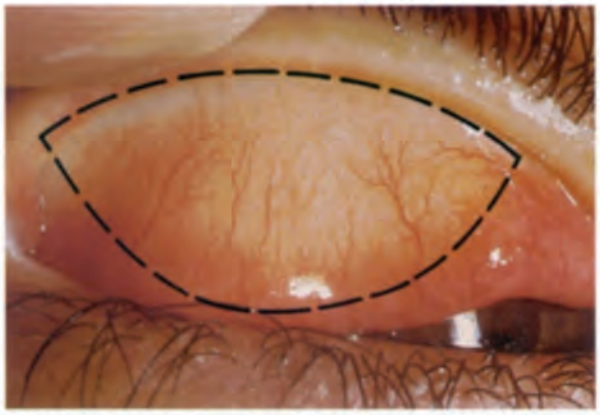
Appendix 3. Trachoma grading card

TRACHOMA GRADING CARD

– Each eye must be examined and assessed separately.
– Use binocular loupes (x 2.5) and adequate lighting (either daylight or a torch).
– Signs must be clearly seen in order to be considered present.

The eyelids and cornea are observed first for inturned eyelashes and any corneal opacity. The upper eyelid is then turned over (everted) to examine the conjunctiva over the stiffer part of the upper lid (tarsal conjunctiva).

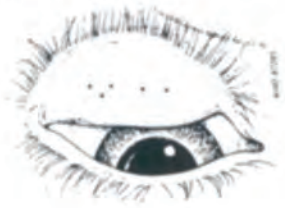
The normal conjunctiva is pink, smooth, thin and transparent. Over the whole area of the tarsal conjunctiva there are normally large deep-lying blood vessels that run vertically.

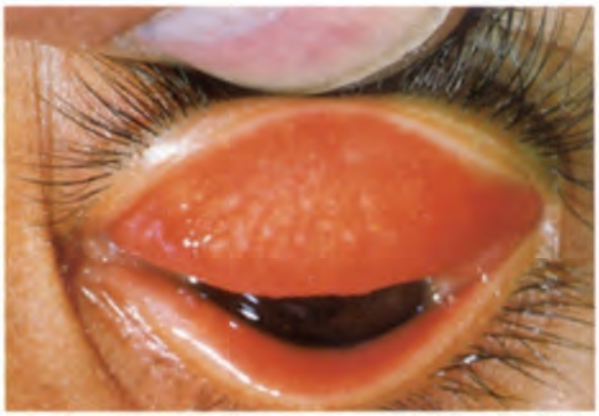


Normal tarsal conjunctiva (x 2 magnification). The dotted line shows the area to be examined.

TRACHOMATOUS INFLAMMATION – FOLLICULAR (TF): *the presence of five or more follicles in the upper tarsal conjunctiva.*

Follicles are round swellings that are paler than the surrounding conjunctiva, appearing white, grey or yellow. Follicles must be at least 0.5mm in diameter, i.e., at least as large as the dots shown below, to be considered.





Trachomatous inflammation – follicular (TF).

TRACHOMATOUS INFLAMMATION – INTENSE (TI): *pronounced inflammatory thickening of the tarsal conjunctiva that obscures more than half of the normal deep tarsal vessels.*

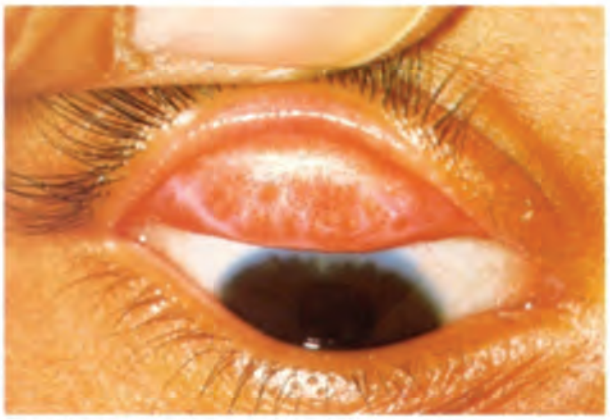
The tarsal conjunctiva appears red, rough and thickened. There are usually numerous follicles, which may be partially or totally covered by the thickened conjunctiva.

Trachomatous inflammation – follicular and intense (TF + TI).

Appendix 3. Trachoma grading card

***TRACHOMATOUS SCARRING (TS)**: the presence of scarring in the tarsal conjunctiva.*

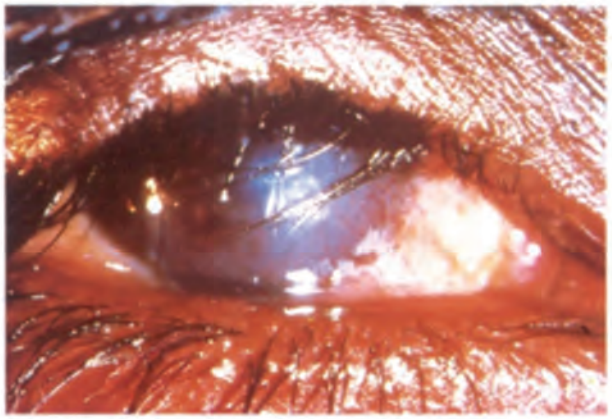
Scars are easily visible as white lines, bands, or sheets in the tarsal conjunctiva. They are glistening and fibrous in appearance. Scarring, especially diffuse fibrosis, may obscure the tarsal blood vessels.



Trachomatous scarring (TS)

***TRACHOMATOUS TRICHIASIS (TT)**: at least one eyelash rubs on the eyeball.*

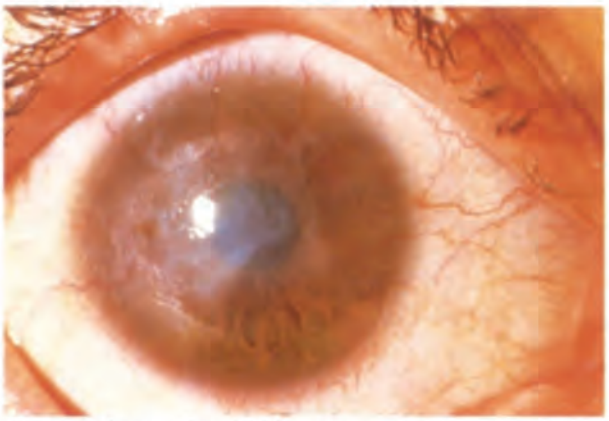
Evidence of recent removal of inturned eyelashes should also be graded as trichiasis.



Trachomatous trichiasis (TT)

***CORNEAL OPACITY (CO)**: easily visible corneal opacity over the pupil.*

The pupil margin is blurred viewed through the opacity. Such corneal opacities cause significant visual impairment (less than 6/18 or 0.3 vision), and therefore visual acuity should be measured if possible.



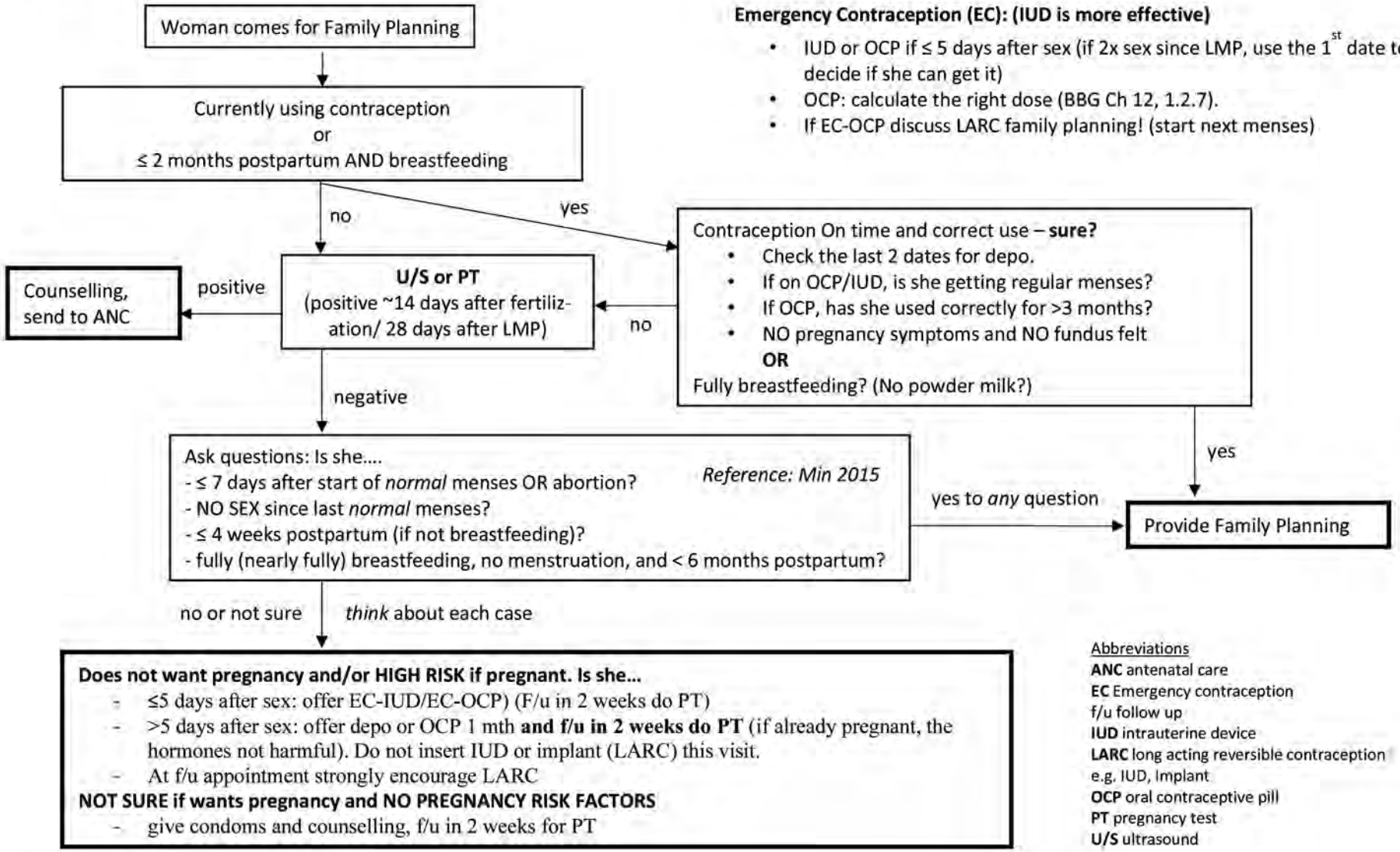
Corneal opacity (CO)

TF:– give topical treatment (e.g. tetracycline 1%).
TI:– give topical and consider systemic treatment.
TT:– refer for eyelid surgery.

WORLD HEALTH ORGANIZATION
PREVENTION OF BLINDNESS AND DEAFNESS

Support from the partners of the WHO Alliance for the Global Elimination of Trachoma is acknowledged.

Appendix 4. Family Planning flowsheet



Family planning flow SOP, version 2, 4 Dec 2019

Appendix 5. GBV pocket guide.
This resource is taken from: www.gbvguidelines.org

သင့်ဧရိယာတွင်

ကျားမရေးရာအခြေပြု အကြမ်းဖက်မှုအတွက်

လုပ်ဆောင်ပေးနေသူများ မရှိပါက

ရှင်သန်ကျန်ရစ်သူအား
ထောက်ပံ့ပေးရန်အတွက်
အိတ်ဆောင်လမ်းညွှန်

This resource is a companion guide to the 2015 IASC GBV Guidelines.
www.gbvguidelines.org

www.gbvguidelines.org/pocketguide

GET IT ON Google Play Available on the App Store

GBV Pocket Guide

အိတ်ဆောင်လမ်းညွှန်ဆိုသည်မှာ အဘယ်နည်း ?

အသုံးပြုသူအတွက် အကြံပြုချက်များ / အသုံးပြုပုံလမ်းညွှန်တို့ပါရှိသော အိတ်ဆောင်လမ်းညွှန်သည် လူသားရေးစာနာထောက်ထားမှုလုပ်ငန်း လုပ်ဆောင်ဖန်သူများ အားလုံးအတွက် အောက်ပါ သတင်းအချက်အလက်များကို ပံ့ပိုးပေးထားပါသည်။

- ကျားမအခြေပြုအကြမ်းဖက်မှု (GBV) ရှင်သန်ကျန်ရစ်သူကို မည်သို့ ပံ့ပိုးကူညီမည်နည်း၊
- မည်သူက ၎င်းတို့၏ GBV တွေ့ကြုံခံစားရမှုကို သင့်ထံ ဖွင့်ဟပြောပြမည်နည်း၊
- GBV လုပ်ဆောင်သူ (GBV လွှဲပြောင်းညွှန်းပို့မှု လမ်းကြောင်း သို့မဟုတ် GBV ကာဝန်ခံအပါအဝင်) ရရှိနိုင်သော အခြေအနေ၊

အိတ်ဆောင်လမ်းညွှန်တွင် ရှင်သန်ကျန်ရစ်သူများအတွက် နောက်ထပ်ဆိုးကျိုးများ၊ သက်ရောက်စေခြင်း ရှိစေဘဲ အခြေခံ ကူညီပံ့ပိုးမှုများနှင့် သတင်းအချက်အလက်များပေးခြင်းအတွက် နိုင်ငံတကာစံနှုန်းများကို အသုံးပြုထားပါသည်။ ရှင်သန်ကျန်ရစ်သူဝတ်ပြုချဉ်းကပ်ဆောင်ရွက်မှုနည်းလမ်းအား ဆက်လက်ထိန်းသိမ်း၍ ဝိဒိတို့၏ ဒေသအခြေအနေနှင့် လိုက်လျောညီထွေစေရန်အတွက် ဤလမ်းညွှန်ကို GBV ကျွမ်းကျင်ပညာရှင်တစ်ဦး၏ အကူအညီဖြင့် ပြုပြင်ပြောင်းလဲ အသုံးပြုရန် တိုက်တွန်းလိုသည်။

အိတ်ဆောင်လမ်းညွှန်တွင်ပါရှိသော (ပြင်ဆင်၊ ကြည်ရွှာ၊ နားထောင်နှင့် ချိတ်ဆက်ပေး) ဟူသည့် စိတ်ပိုင်းဆိုင်ရာ ရှေးဦးပြုစုနည်း (Psychological First Aid – PFA) မူဘောင်ကို အသုံးပြုရန်အတွက် PFA အကြောင်း သိရှိထားရန် သို့မဟုတ် သင်တန်းရထားရန် လိုအပ်သော်လည်း တက်စုံလေ့ကျင့်သင်ကြားပေးသည့် PFA သင်တန်းမျိုးကိုမူ အားပေးတိုက်တွန်းလိုပါသည်။

အကိုင်း	စာမျက်နှာ	အသုံးပြုရန်
အဓိကအကြောင်းအထားသောအချက်များ	၂-၃	လက်ဝင်းအသုံးပြုနိုင်ရန် လမ်းညွှန်
ဆုံဖြတ်ချက်သစ်တင်	၄	
ရရှိနိုင်သော လမ်းကြောင်းမှများအကြောင်း သတင်းအချက်အလက်စာရွက်	၅-၆	
တောလန့် ဖရောင်းရန် များနှင့် ဒဏ်ရာရသည့် အရေးများ- ကြည့်ရှု နားဆောင် ချိတ်ဆက်ပေး		
လုပ်ငန်းအဆင့်ဆင့်အတွက် လမ်းညွှန်ချက် ကူညီပံ့ပိုးမှု ရယူခြင်းနှင့် PSEA ပြင်ဆင်၊ ကြည့်ရှု၊ နားဆောင် နှင့် ချိတ်ဆက်ပေး	၇-၁၀	ကြိုတင်ပြင်ဆင်ခြင်း၊ တွေ့ပြန်ခန့်ဆောင်ရွက်ရန် လိုအပ်သည့် အသေးစိတ်၊ ကျွမ်းကျင်မှုများ ပြုပြုပြင်ပြင်ဆင်ခြင်း
လေ့လေ့များနှင့် ဆက်သွယ်ကူညီရန်များ	၁၁-၁၅	အသေးစိတ် အချက်အလက်များနှင့် ဆင်ခြေတုံ့ပြန်ချက်များအတွက် လက်ဝင်းအသုံးပြုရန် လမ်းညွှန်

အိတ်ဆောင်လမ်းညွှန်အား အသုံးပြုခြင်းဆည် ဒေတာထောက်နောက်ခံ မတ်စုတစ်ခု ဖြစ်နိုင်အတဲ့အို့ အသုံးပြုသူအတွက် လမ်းညွှန်တောင်းတစ်ခုလည်း ဖြစ်နိုင်ပါဆည်

KEY MESSAGES

• ဝိဒိ၏ဒေသတွင် မည်သည့် GBV ဝန်ဆောင်မှုများ ရရှိနိုင်ကြောင်းကို သိရှိရန် GBV ကျွမ်းကျင်ပညာရှင်တစ်ဦးနှင့် ဦးစွာ ဆက်သွယ်၍ အစဉ်အမြဲ ဆွေးနွေးပါ။ အချို့ဝန်ဆောင်မှုများသည် အရေးပေါ်ဖုန်းလိုင်းများ၊ ဝိုဘိုင်းအဝလီကေးရှင်း၊ သို့မဟုတ် အခြား အဝေးထိန်းပုံပိုးကူညီမှုများ ပုံစံဖြင့် ရရှိနိုင်ပါသည်။

• ဝိဒိ၏ ဒေသတွင် ရရှိနိုင်သည့် အခြား မည်သည့် ဝန်ဆောင်မှုမဆိုကို သိရှိအောပ်လုပ်ပါ၊ ကျန်းမာရေး၊ စိတ်လှုပ်ရှားရေးဆိုင်ရာ ပံ့ပိုးမှု၊ ဝိုနာရာဝန ရာနှင့် အစားအစာ ဟုတ်သော ပစ္စည်းများကဲ့သို့ လူသားချင်း စာနာထောက်ထားမှု ပိတ်ဖက်များမှ ပံ့ပိုးပေးနေသော ဝန်ဆောင်မှုများကို ရှာဖွေတော် ထုတ်ပါ၊ ပလီများ/ ခရစ်ယာန် ဘုရားကျောင်းများ၊ အမျိုးသမီးများနှင့် မသန်စွမ်းဝန်ဆောင်မှု အစွဲအစည်းများကဲ့သို့ ရပ်ရွာလူထု အခြေခြေ ဝန်ဆောင်မှုများကိုလည်း ထည့်သွင်းစဉ်းစားပါ၊

• ဝိဒိ၏ အခန်းကဏ္ဍကို ဖေဖျပါနှင့်၊ နားထောင်ပေးပါ၊ ဝေဖန်ဆုံးဖြတ်သတ်မှတ်မှု မပြုပါနှင့်၊ ရရှိနိုင်သည့် ဝန်ဆောင်မှုများအကြောင်း တိကျသည့် နောက်ဆုံးရ သတင်းအချက်အလက်များကို ပေးပါ၊ ရှင်သန်ကျန်ရစ်သူကိုယ်တိုင် ဖွေးချယ်ခွင့်များ ပေးပါ၊ ဝိဒိ မည်သည့်အရာကို စီမံဆောင်ရွက်ပေးနိုင်သည်၊ မည်သည့်အရာကို မဆောင်ရွက်ပေးနိုင်ဆိုသည်ကို သိရှိပါစေ၊ ဝိဒိ၏ဒေသတွင် GBV လုပ်ငန်းအစီစဉ်များ ပေးဝန်ထမ အဖွဲ့အစည်းရှိမှု ဆိုလျှင်ပင် ရှင်သန်ကျန်ရစ်သူများ လိုအပ်သည့် ဝန်ထမ်းရုံနှင့် ထပ်ဆောင်းလိုအပ်သည့် ပံ့ပိုးကူညီမှုတို့ပေးနိုင်သော ကလေးသူငယ် ကာကွယ်စောင့်ရှောက်ရေး သို့မဟုတ် စိတ်ကျန်းမာရေးပညာရှင်တို့ကဲ့သို့ အခြားမိတ်ဖက်များ ရှိဝန်နိုင်ပါသည်၊ ရှင်သန်ကျန်ရစ်သူများကို အခြားမည်သူနှင့် ဆက်သွယ်ပေးသည်ဖြစ်စေ ၎င်းတို့ထံမှ ခွင့်ပြုချက်ကို ဦးစွာတောင်းခံပါ၊ ရှင်သန်ကျန်ရစ်သူက ငြင်းဆိုလျှင် သူ/သူမကို လက်ခံရန် အတင်းဖိအားမပေးပါနှင့်၊

• ဝိဒိက ဦးစွာ GBV အကြမ်းဖက်ခံရသူများကို မရှာဖွေ၊ မဖော်ထုတ်ပါနှင့်၊ တစ်စုံတစ်ယောက်က အကူအညီတောင်းခံလာလျှင်သာ ကူညီရန်အသင့် ရှိနေပါ၊

• ဝိဒိကို ပေးအပ်ထားသော တာဝန်ကို အမှတ်ရပါ။ အကူအညီလိုအပ်နေသူများ အမျိုးသား/အမျိုးသမီး ဖြစ်မှု၊ လိင်စိတ် ကိုင်းညွှတ်မှု၊ လိင်ဝိသေသ ခံယူမှု၊ အိမ်ထောင်ရှိမှု/မရှိမှု၊ မသန်စွမ်းဖြစ်မှု၊ အသက်အရွယ်၊ တိုင်းရင်းသား/ လူမျိုးစု/ လူမျိုး/ ကိုးကွယ်မှုတို့ မည်သို့ပင်ဖြစ်စေ၊ အကြမ်းဖက်မှုကို ကျူးလွန်သည့်သူ မည်သူပင်ဖြစ်စေ၊ အကြမ်းဖက်မှု ကျူးလွန်ခဲ့သည့်အခြေအနေ မည်သို့ပင်ဖြစ်စေကာမူ ယင်းတို့ကို ဝေဖန်ဆုံးဖြတ်ခြင်း၊ ကင်းမွာ၊ ခွဲခြားဆက်ဆံခြင်းကင်းစွာ ကူညီပံ့ပို့၊ ပေးရန်အတွက်လူသားချင်းစာနာထောက်ထားမှု လုပ်ငန်း ဆောင်ရွက်နေသူများတွင် တာဝန်ရှိသည်၊

အောက်ပါတို့ကို ကျင့်သုံးခြင်းဖြင့် အကြမ်းဖက်သူ ဝတ်ပြု ချဉ်းကပ်ဆောင်ရွက်မှု နည်းလမ်းကို အသုံးပြုခြင်း

• လေးစားမှု – သင်၏ လုပ်ဆောင်မှုများ၊ အားလုံးသည် အကြမ်းဖက်ခံရသူ၏ ဂျွေးချယ်မှု၊ ဆန္ဒများ၊ ရုပိုင်ခွင့်များ၊နှင့် ဂုဏ်သိက္ခာကို လေးစား မှုဖြင့် လုပ်ဆောင်ရမည်၊

• တေးကင်းလုံခြုံမှု – ရှင်သန်ကျန်ရစ်သူ၏ တေးကင်းလုံခြုံရေးသည် နံပါတ်တစ် ဦးစားပေး ကိစ္စ ဖြစ်သည်၊

• လျှို့ဝှက်ထိန်းသိမ်းမှု –လူများတွင် ၎င်းတို့၏ အကြောင်းကို မည်သူကိုမြောပြမည် သို့မဟုတ် မည်သူကို မပြောပြ ဆိုသည်ကို ဖွေးချယ်ပိုင်ခွင့် ရှိသည်၊ လျှို့ဝှက်ထိန်းသိမ်းခြင်း ဆိုသည်မှာ မည်သူ့ထံကိုမျှ မည်သည့်သတင်းအချက်အလက်ကိုမျှ အသိပေးမှု မပြုခြင်း ဖြစ်ပါသည်၊

• ခွဲခြားဆက်ဆံမှုကင်းခြင်း – အကူအညီလို အပ်သူ မည်သူမဆိုအား တန်းတူ ညီမျှမှု တရား မျှတစွာ ဆက်ဆံခြင်း ဖြစ်သည်၊

• ကျန်းမာရေးဝန်ဆောင်မှုများရှိလျှင် မည်သည့် ဝန်ဆောင်မှုများကို ရရှိနိုင်ကြောင်း အခြေတမ်း အသိပေးပါ၊ ဝိဒိသိသည်များကို မျှဝေပေးပါ၊ အရေးအကြီးဆုံးမှာ ဝိဒိ ဘာကို ဝသိပါ ဆိုသည် ကိုလည်း ရှင်းပြပါ၊ ထိုဝန်ဆောင်မှုများကို ရယူလိုခြင်း ရှိ/မရှိကို သူ/သူမအား ဆုံးဖြတ်ခွင့်ပေးပါ၊ အရည်အသွေးမီသော ဆေးကုသ စောင့်ရှောက်မှုကို အကြမ်းဖက်ခံရပြီး ၇၂ နာရီအတွင်း ရရှိလျှင် လိင်မှတစ်ဆင့် ကူးစက်သော ရောဂါပိုးများ ဝင်ရောက်မှုကို ကာကွယ်နိုင်ပြီး နာရီ ၁၂၀ အတွင်း ရရှိလျှင် လိုရချင်သည့် ကိုယ်ဝန်ကို တားဆီးနိုင်ပါသည်၊

---➔ မသန်စွမ်းသူများအနေဖြင့် ၎င်းတို့ ဆန္ဒရှိလျှင် ၎င်းတို့ကို ပြုစုစောင့်ရှောက်ပေးသူ မပါဘဲ သင့်ကို ဆက်သွယ် ပြောဆိုနိုင်မည့် အခွင့်အရေးကို ဖန်တီးပေးပါ။ မသန်စွမ်းသူနှင့် ၎င်း၏ ပြုစုစောင့်ရှောက်သူကြား ဆက်ဆံရေးကို မထိခိုက်စေအောင် (သို့မဟုတ်) တင်းမာမှုများ မဖြစ်စေအောင် ဆောင်ရွက်ပေးပါ။

---➔ အမျိုးသားတစ်ဦး သို့မဟုတ် ယောကျ်ားလေးတစ်ဦး အဓမ္မပြုကျင့်ခံရသဖြင့် ၎င်းကို လိင်တူချစ်သူ အမျိုးသား (သို့မဟုတ်) လိင်တူလိင်ကွဲချစ်သူတစ်ဦးဟု ယူဆ၍မရပါ။ ကျားမအခြေပြု အကြမ်းဖက်မှုသည် လူတစ်ဦး၏ ဗိုမ လက္ခဏာ (sexuality) ပေါ် အခြေမခံဘဲ ဩဇာအာဏာ (power) ပေါ်တွင် အခြေခံပါသည်။

---➔ လိင်မှုဆိုင်ရာနှင့် ကျားမရေးရာ လူနည်းစု အုပ်စုများသည် ၎င်းတို့၏ လိင်စိတ်ကိုင်းညွတ်မှု သို့မဟုတ် လိင်ဝိသေသခံယူမှု သို့မဟုတ် နှစ်မျိုးစလုံးကြောင့် မကြာခဏဆိုသလို ထိခိုက်ခံရမှုနှင့် အကြမ်းဖက်မှုကို ခံရနိုင်သည့် အန္တရာယ်ပိုများပါသည်။ ရှင်သန်ကျန်ရစ်သူများအားလုံးကိုစူးစိုက်စွာ နားထောင်ပေးပါ။ ကူညီ ပံ့ပိုးပေးနိုင်ရန် ကြိုးစားပါ။

---➔ အိမ်ထောင်ဖက်၊ ရင်းနှီးကျွမ်းဝင်သော လက်တွဲဖော်၊ မိသားစုဝင်၊ ပြုစုစောင့်ရှောက်ပေးနေသူ၊ စဝ်ပွန်း/ဇနီး ဘက်မှ ဆွေမျိုးများ၊ လူစိမ်း၊ မိဘ သို့မဟုတ် လိင်မှုကိစ္စ ဆောင်ရွက်မှုတစ်ခုကို ငွေ သို့မဟုတ် ပစ္စည်းဖြင့် လဲလှယ်ရယူသူ အပါအဝင် မည်သူမဆိုသည် ကျားမအခြေပြုအကြမ်းဖက်မှု တစ်ခုကို ကျူးလွန်နိုင်သည်။

---➔ မည်သူမဆိုသည် အကြမ်းဖက်မှုကျူးလွန်ခံရသူများ ဖြစ်နိုင်သည်။ အိမ်ထောင်ရှိသူများ၊ သက်ကြီးရွယ်အိုများ၊ လိင်လုပ်သားဖြင့် လုပ်ကိုင်နေသူများသည် အကျူးလွန်ခံရသူ မဖြစ်နိုင်ပါဟု ကန့်သတ်၍မရပါ။

---➔ ရှင်သန်ကျန်ရစ်သူ တစ်ဦး၏ ဘေးကင်းလုံခြုံမှုအတွက် ဆောင်ရွက်ပေးပါ။ မည်သူမည်ဝါဖြစ်ကြောင်း လူမသိအောင် ထိန်းသိမ်းကာကွယ်ပေးပါ။ အကြမ်းဖက်ခံရသူ၏ ပုဂ္ဂိုလ်ရေး အချက်အလက်များ သို့မဟုတ် မည်သူမည်ဝါဖြစ်ကြောင်း ဖော်ပြနိုင်သည့် သတင်းအချက်အလက်များ သို့မဟုတ် ၎င်း၏ အတွေ့အကြုံများကို ချရေးခြင်း၊ ဓာတ်ပုံရိုက်ခြင်း သို့မဟုတ် မိမိ၏ ကြီးကြပ်သူအရာရှိထံသို့ အပါအဝင် နှုတ်ဖြင့် ပြောပြခြင်းတို့ကို ရှောင်ရှားပါ။ ရှင်သန်ကျန်ရစ်သူ၏ အသံဖမ်းယူခံရမည်ကို စိုးရိမ်ပူပန်စရာမလိုရလေအောင် ဖုန်းများနှင့် တွန်ပျူတာများကို သိမ်းဆည်းထားပါ။

---➔ မည်သူမည်ဝါဖြစ်ကြောင်း ညွှန်ပြနိုင်သည့် သတင်းအချက်အလက်များ/ ပုဂ္ဂိုလ်ရေးသတင်းအချက်များထဲတွင် ရှင်သန်ကျန်ရစ်သူ၏ အမည်၊ ကျူးလွန်သူ(များ)၏ အမည်၊ မွေးသက္ကရာဇ်၊ မှတ်ပုံတင်နံပါတ်၊ အိမ်လိပ်စာ၊ အလုပ်လိပ်စာ၊ ၎င်း၏ သားသမီးများ ကျောင်းတက်နေသည့်ဒေသ၊ အကြမ်းဖက်မှု ဖြစ်ခဲ့သည့်အချိန်နှင့် နေရာအတိအကျ၊ စသည်တို့ ပါဝင်ပါသည်။

---➔ မည်သူမည်ဝါဖြစ်ကြောင်း ညွှန်ပြနိုင်ခြင်း မရှိသည့် ယေဘုယျသတင်းအချက်အလက်များကို အောက်ပါတို့ထဲ မျှဝေပေးပါ -

- မိမိ၏ အစီအစဉ် ပိုမိုဘေးကင်းလုံခြုံမှုရှိစေရန် ကြိုးပမ်းသည့် အခါ မိမိ၏အဖွဲ့ သို့မဟုတ် လုပ်ငန်းကဏ္ဍမှ မိတ်ဖက်များထံ အသိပေးပါ။

- မိမိကိုယ်တိုင် စောင့်ရှောက်မှုနှင့် အားပေးမှုတို့ ရယူရန် ဆောင်ရွက်ပေးသောအခါ မိမိ၏ ကူညီပံ့ပိုးမှု တွန်ရက်သို့ အသိပေးပါ။

- လူများသည် ရေခပ်သည့် နေရာများတွင် စော်ကားနှောင့်ယှက် တိုက်ခိုက်ခံရတတ်သည်ကို ကျွန်တော်/ကျွန်မ သတိပြုမိသည်။ ထိုနေရာများသည် ဝေးလံပြီး တသီးတခြား ရှိနေတတ်သောကြောင့် ဖြစ်သည်။ ပိုနီးသော နေရာတွင် ရေခပ်ရန် သို့မဟုတ် အဖွဲ့လိုက်သွားရန် အကြံပေးခြင်း သို့မဟုတ် ......ခြင်းဖြင့် ထိုအန္တရာယ်ကို လျှော့ချရန် ကြိုးစားပေးနိုင်သည်။

- တစ်စုံတစ်ယောက် သူ ဆိုးဆိုးရွားရွား ကြုံတွေ့ခဲ့ရသည့် အတွေ့အကြုံကို ကျွန်တော်/ကျွန်မတို့ ပြောပြခဲ့သည်။ အသေးစိတ်ကိုတော့ ပြောမပြနိုင်ပါ။ သို့သော် သည်ဖြစ်ရပ်နဲ့ ပတ်သက်ပြီး ကျွန်တော် / ကျွန်မအပေါ် သက်ရောက်နေသည့်အတွက် အကူအညီ လိုအပ်နေပါသည်။

သုံးဖြတ်ချက်သစ်ပင်

ကလေးများနှင့် ဆယ်ကျော်သက်များအတွက် စာမျက်နှာ ၁၆ တွင် ဖတ်ရှုပါ။

ပြင်ဆင်ပါ
(ရရှိနိုင်သည့် ဝန်ဆောင်မှုများကို သိရှိအောင်လုပ်ထားခြင်း)

GBV ဖြစ်ရပ်တစ်ခုကို သင်ထံ ဖွင့်ဟအသိပေးလာသည့်အခါ ...

အခြားသူတစ်ဦးက ဖွင့်ဟလျှင် ...
ရှင်သန်ကျန်ရစ်သူအတွက် ရရှိနိုင်သည့် ဝန်ဆောင်မှုနှင့် ကူညီပံ့ပိုးမှုအားလုံး အကြောင်း တိကျသည့် နောက်ဆုံးရ သတင်းအချက်အလက်များကို ပေးပါ။ ရှင်သန်ကျန်ရစ်သူ၏ အမည်ပါ သတင်းအချက်အလက်များကို ဘေးကင်းလုံခြုံစွာ၊ လျှို့ဝှက်ထိန်းသိမ်းမှုရှိစွာ မျှဝေပေးဖို့ ဖွင့်ဟပြောပြလာသူကို တိုက်တွန်းပါ။ သို့မှသာ ရှင်သန်ကျန်ရစ်သူက ဖွင့်ဟ ပြောပြလိုသည့် ဆန္ဒ ရှိလာမည်ဖြစ်သည်။
ဆတိပြုရန် - GBV ရှင်သန်ကျန်ရစ်သူများက သိရှိအောင် မိမိက ဖော်ထုတ်ခြင်း မျိုး မလုပ်ပါနှင့်။

အကြမ်းဖက်ခံရသူကိုယ်တိုင်ကဖွင့်ဟလျှင် ...
ကြည့်ရှုပါ၊ နားထောင်ပါ။
[စာမျက်နှာ ၇ နှင့် ၈ ကို ကြည့်ပါ]
သင့်ကိုယ်သင် မိတ်ဆက်ပါ။ သင် မည်သို့ ကူညီပေးရမည်နည်းဟု မေးပါ။ လေးစားမှု၊ ဘေးကင်းလုံခြုံမှု၊ လျှို့ဝှက်ထိန်းသိမ်းမှုနှင့် ခွဲခြားဆက်ဆံခြင်းကင်းမှုတို့ကို လိုက်နာကျင့်သုံးပါ။

GBV လုပ်ဆောင်သူ/လွှဲပြောင်းညွှန်းပို့မှု လမ်းကြောင်း ရှိပါသလား။

ရှိပါသည်။ GBV လွှဲပြောင်းညွှန်းပို့မှု လမ်းကြောင်းအတိုင်း ရရှိနိုင်သည့် GBV ဝန်ဆောင်မှုများအကြောင်းကို ရှင်သန်ကျန်ရစ်သူအား အသိပေးပါ၊ ရှင်သန်ကျန်ရစ်သူ သဘောတူပါက လွှဲပြောင်းညွှန်းပို့ပေးပါ။

မရှိပါ။ မိတ်ဆက်ပေးပါ [စာမျက်နှာ ၉ နှင့် ၁၀ ကို ကြည့်ပါ] ရရှိနိုင်သော ဝန်ဆောင်မှုများအကြောင်း တိကျသည့် သတင်းအချက်အလက်များကို ဆက်သွယ် အသိပေးပါ။

ရှင်သန်ကျန်ရစ်သူက ဝန်ဆောင်မှုတစ်ခုနှင့် မိတ်ဆက်ပေးခြင်းကို ခံယူရန် ရွေးချယ်ပါသလား။

ရွေးချယ်ပါသည်။ ရရှိနိုင်သော အရင်းအမြစ်/ဝန်ဆောင်မှုကို မည်သို့ လက်လှမ်းမီ ရယူ အသုံးပြုနိုင်မည်၊ ဘေးအန္တရာယ်ကင်းရှင်းစေရန် မည်သည့် သယ်ယူပို့ဆောင်ရေးနည်းလမ်းကို ရွေးချယ်သွားရောက်နိုင်သည်၊ စသည် အပါအဝင် အရင်းအမြစ်/ဝန်ဆောင်မှုအကြောင်း အသေးစိတ် သတင်းအချက်အလက်များကို ဆက်သွယ်အသိပေးပါ။ ရှင်သန်ကျန်ရစ်သူ၏ ကောင်းစွာသိရှိပြီးမှုပေးသည့် အတိအလင်းသဘောတူညီချက် မရှိဘဲ ၎င်းအကြောင်း သတင်းအချက်အလက်များ သို့မဟုတ် ၎င်း၏ အတွေ့အကြုံများကို မည်သူ့ထံမျှ အသိမပေးပါနှင့်။ အဖြစ်အပျက်၏ အသေးစိတ် အချက်အလက်များ သို့မဟုတ် အကြမ်းဖက်ခံရသူ၏ ပုဂ္ဂိုလ်ရေး အချက်အလက်များကို မှတ်တမ်းတင်မထားပါနှင့်။

မရွေးချယ်ပါ၊ လျှို့ဝှက်ထိန်းသိမ်းပေးပါ။ ရှင်သန်ကျန်ရစ်သူသည် နောက်ပိုင်းတွင် စိတ်ပြောင်းပြီး ဝန်ဆောင်မှုများကို ရယူလိုလျှင် ရယူနိုင်ကြောင်း ရှင်းပြပါ။ အကယ်၍ ဝန်ဆောင်မှုများသည် ယာယီ၊ ရွေ့လျား သို့မဟုတ် အချိန်အကန့်အသတ် တစ်ခုအတွင်းသာ ရရှိနိုင်ပါက ဝန်ဆောင်မှုများ ရပ်တန့်သွားမည့် အချိန်ကို အသိပေးပါ။

ယာယီအဆောက်အဦးဆိုင်ရာအစုအဖွဲ့၏ GBV Constant Companion မှ အင်္ဂလိပ်ဘာသာမှ ပြန်လည် အသုံးပြုထားသည်။

3 4

Appendix 5. GBV pocket guide. This resource is taken from: www.gbvguidelines.org

ဝန်ဆောင်မှုသတင်းအချက်အလက်စာရွက်

မိမိ၏ဒေသတွင် ရရှိနိုင်သော ဝန်ဆောင်မှုများကို ဤသတင်းအချက်အလက်စာရွက်တွင် ဖြည့်စွက်ကာ အလွယ်တကူ လက်လှမ်းမီနိုင်သည့် နေရာတွင် ထားပါ။

မိမိ၏ GBV ကျွမ်းကျင်ပညာရှင်၊ မိမိ၏ အဖွဲ့ခေါင်းဆောင်၊ မိတ်ဖက်များနှင့်အတူတကွ (၁) လူသားချင်းစာနာထောက်ထားမှုလုပ်ငန်း လုပ်ဆောင်နေသော မိတ်ဖက်များမှ ဆောင်ရွက်ပေးနေသည့် ရရှိနိုင်သော ဝန်ဆောင်မှုများနှင့် (၂) ဘာသာရေးအဖွဲ့များ/ ဘုရားဝတ်ပြုရုံဝေါ်မှုပြုရာနေရာများ၊ အမျိုးသမီးအဖွဲ့များ၊ မသန်စွမ်းအဖွဲ့အစည်းများ၊ စသည်တို့ကဲ့သို့ လူထုအခြေပြုဝန်ဆောင်မှုများကို သတ်မှတ်ဖော်ထုတ်ပါ။

ကင်းလွင်သူငယ်ကာကွယ်စောင့်ရှောက်ခြင်း	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
စိတ်ကျန်းမာရေး/ စိတ်လှုပ်ရှားရေး ပံ့ပိုးကူညီမှု	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
ကျန်းမာရေး	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
လိင်မှုဆိုင်ရာနှင့် မျိုးဆက်ပွားကျန်းမာရေး	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
အစားအစာမဟုတ်သည့် ထောက်ပံ့ပစ္စည်းများ/ dignity kit များ အပါအဝင် WASH	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
ပို့နှုန်းရာ အပိုင်းအကာ	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	

ဥပဒေရေးရာ	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
အစားအစာနှင့် အာဟာရ	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
ဆယ်ကျော်သက်များ လူငယ်များအတွက် ဝန်ဆောင်မှုများ	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
မသန်စွမ်းသူများအတွက် ဝန်ဆောင်မှုများ	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
လိင်မှုဆိုင်ရာနှင့် ကျားမရေးရာ လူနည်းစုအုပ်စုများ အတွက် ဝန်ဆောင်မှုများ	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
ကင်းလး သို့မဟုတ် အမျိုးသမီးဦးစီးသော အိမ်ထောင်စုများအတွက် ဝန်ဆောင်မှုများ	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
အခြား	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	
အခြား	သတင်းအချက်အလက်များ	
	တာဝန်ခံများ	

ဆောင်ရန်၊ ရှောင်ရန်နှင့် ပြောဆိုရမည့်စကားများ

ကလေးများနှင့် ဆယ်ကျော်သက်များအတွက် တရုတ်နှာ ၁၆ တွင် တော်မူပါ၊

ကြည့်ရှုပါ

ဆောင်ရန်

- ရှင်သန်ကျန်ရစ်သူ သင့်ထံ ချဉ်းကပ်လာခြင်းကို ခွင့်ပြုပါ။ ၎င်း၏ လိုအပ်ချက်များကို နားထောင်ပါ။
- အရေးပေါ်လိုအပ်သည့် မည်သည့်အဖြေခံလိုအပ်ချက်များကို သင့်အနေဖြင့် မည်သို့ ဖြည့်ဆည်း ပံ့ပိုးပေးနိုင်မည် ဆိုသည်ကို ဦးစွာမေးပါ။ ရှင်သန်ကျန်ရစ်သူအချို့သည် ဆေးပါးကုသစောင့်ရှောက်မှု သို့မဟုတ် အဝတ်အစားများကို ချက်ချင်း လိုအပ်ပါသည်။
- သင် ရှိနေသည့် နေရာတွင် သင့်ကို စကားပြောရန် ရှင်သန်ကျန်ရစ်သူအနေဖြင့် သက်တောင့်သက်သာ ရှိ/မရှိ မေးပါ။ ရှင်သန်ကျန်ရစ်သူတွင် အဖော်လိုက်လာသူတစ်ဦး ပါ/မပါ ဆိုသူ၏ ရှေ့တွင် ရှင်သန်ကျန်ရစ်သူ၏ အတွေ့အကြုံကို မေးခြန်း ပြောဆိုရန် အန္တရာယ်မရှိနိုင်ဟု တထစ်ချ မယူဆပါနှင့်။
- အနှောင့်အယှက်ကင်းစွာ သီးသီးသန့်သန့် ထိုင်နေနိုင်သည့် နေရာ၊ တစ်သျှူး၊ စသည်ကို ပေးခြင်းကဲ့သို့ လက်တွေ့လိုအပ်သော အကူအညီများကို ပေးပါ။
- လိုအပ်ပါက ရှင်သန်ကျန်ရစ်သူအတွက် ဘာသာပြန်ပေးနိုင်မည့် သို့မဟုတ် ကူညီပံ့ပိုးပေးနိုင်မည့် သို့မဟုတ် နှစ်ခုစလုံးကို လုပ်ပေးနိုင်မည့် သူ/သူမ အတွက် အဆင်ပြေမည့်သူ တစ်ဦးဦးကို ဖွေးချယ်ပေးဖို့ အတတ်နိုင်ဆုံး ကြိုးစား၍ ပြောပါ။

ရှောင်ရန်

- သင့်ထံ ချဉ်းကပ်လာပြီး ၎င်းတို့၏ ဆိုးရွားသည်၊ ပြောပြရန် စက်ခဲသည်၊ မှားယွင်းသည်နှင့်/သို့မဟုတ် အကြမ်းဖက်မှုကို တွေကြုံခံစားခဲ့ရပွဲ အား ပြောပြသည့်သူကို လျစ်လျူမရှုပါနှင့်၊
- ဝိုင်စိုးဝိုင်နင်း သို့မဟုတ် တွန်းတွန်းတိုက်တိုက်ဖြင့် လူများကို အတင်းအကျပ် ကူညီခြင်းမျိုး မပြုပါနှင့်၊
- ဝိုကဲစွာ အလွန်အကျွံ တုံ့ပြန်ဆောင်ရွက်ခြင်း မပြုပါနှင့်၊ တည် တည်ငြိမ်ငြိမ် ရှိပါစေ။
- ရှင်သန်ကျန်ရစ်သူ မျှဝေချင်သည်ထက်ပို၍ မျှဝေပေးရန် သူ/သူမကို ဖိအားမပေးပါနှင့်၊ သင်၏ စာဝန်မှာ နားထောင်ပေးရန်နှင့် ရရှိနိုင်သော ဝန်ဆောင်မှုများအကြောင်း သတင်းအချက်အလက်များပေးရန် ဖြစ်သည့်အတွက် အဖြစ်အပျက် အဝေးစိတ်နှင့် မည်သူကကျူးလွန်သနည်းဟူသော အချက်များသည် အရေးမကြီးပါ၊ မလိုအပ်ပါ။
- GBV အကြမ်းဖက်မှုမှ ရှင်သန်ကျန်ရစ်သူ တစ်ဦးကို အဝမြည်ကျင့်ခံခဲ့ရဖူးခြင်း ရှိ/မရှိ၊ အရိုက်နှက်ခံခဲ့ရဖူးခြင်း ရှိ/မရှိ စသဖြင့် မမေးမြန်းပါနှင့်၊

ပြောဆိုရမည့်စကား နမူနာများ ...

- "သင့်ကို ကြည့်ရတာ အရမ်းနာကျင်ခံစားနေရပုံပေါ်တယ်၊ ဆေးခန်း သွားချင်သလား။"
- "ဒီနေရာက သင့်အတွက် အဆင်ပြေသလား။ သင့်အတွက် ပိုပြီးအဆင်ပြေမယ့် တခြားနေရာ တစ်နေရာ ရှိသလား။ ဒီမှာ စကားပြောရတာကို စိတ်သက်တောင့်သက်သာ ရှိပါသလား။"
- "ရေသောက်ချင်သလား၊ လွတ်လွတ်လပ်လပ် ထိုင်ပါနော်။"

နားထောင်ပါ

ဆောင်ရန်

- မျှဝေလာသော သတင်းအချက်အလက် မှန်သမျှကို လျှို့ဝှက်ထိန်းသိမ်းပေးပါ။ ရှင်သန်ကျန်ရစ်သူကို အကောင်းဆုံး ပံ့ပိုးကူညီပေးနိုင်မည့် နည်းလမ်းနှင့် စပ်လျဉ်း၍ အကြံဉာဏ်နှင့် လမ်းညွှန်မှု ရယူရန် လိုအပ်ပါက ကျွမ်းကျင်သူ သို့မဟုတ် သင်၏ လုပ်ဖော်ကိုင်ဖက်တစ်ဦးနှင့် တိုင်ပင်ဆွေးနွေးရန် ရှင်သန်ကျန်ရစ်သူထံမှ ခွင့်ပြုချက် တောင်းပါ။ ရှင်သန်ကျန်ရစ်သူ၏ ပုဂ္ဂိုလ်ရေးအချက်အလက်များကို ထုတ်ဖော်ခြင်းမရှိတဲ့ တိုင်ပင်ဆွေးနွေးပါ။
- မိမိ ရောက်ရှိ နေရာဒေသ အခြေအနေအရ လိုအပ်လျှင် သင်၏ လျှို့ဝှက်ထိန်းသိမ်းပေးနိုင်မှု ကန့်သတ်ချက်များအပေါ် ရှော်လင့်ချက်များ လွန်ကဲစွာ ထားခေရန် လုပ်ဆောင်ပါ။
- သင်၏ အခန်းကဏ္ဍ/တာဝန်အပေါ် လွန်ကဲစွာ ရှော်လင့်ချက်ထားခေရန် လုပ်ဆောင်ပါ။
- သင်က ပြောဆိုခြင်းထက် နားထောင်ခြင်းကို ပိုလုပ်ပါ။
- နှစ်သိမ့်ပေးသည်၊ ဖေးမပေးသည့် စကားအချို့ကို ပြောခြင်းအောင် ပြောပါ။ ဖြစ်ပျက်ခဲ့သည်များသည် ၎င်းတို့၏ အပြစ်မဟုတ်ကြောင်း နားလည်လက်ခံအောင် ပြောပေးပါ။

ရှောင်ရန်

- ဘာကိုမျှ ရေးမှတ်ခြင်း မပြုပါနှင့်၊ သက်ရှင်ကျန်ရစ်သူ အကြမ်းဖက်ခံရသူကို တတ်ပုံ မရှိက်ပါနှင့်၊ ဓုန်းခြင့် သို့မဟုတ် အခြားကိရိယာတစ်ခုခြင့် ပြောဆိုမှုများကို အသံဖမ်းပါနှင့်၊ ဗီဒီယာ အပါအဝင် အခြားသူများကို အသိမပေးပါနှင့်၊
- ဘာဖြစ်ခဲ့သည်ဆိုသည်ကို မမေးပါနှင့်၊ ထိုအစား နားထောင်ပေးပါ၊ သင် ဘာကူညီနိုင်မလဲ ဖေးပါ။
- ရှင်သန်ကျန်ရစ်သူ၏ အတွေ့အကြုံကို အခြားသူ တစ်ဦးကြုံတွေ့ဖြစ်ပျက်ခဲ့သည်နှင့် နှိုင်းယှဉ်ခြင်းများ ပြုပါနှင့်၊ ယခုအခြေအနေသည် အရေးမကြီးဟူ ထည့် ဟန်ပန်ကို မပြုပါနှင့်၊ ထိုသို့သော သဘောသက်ရောက်အောင် မပြောပါနှင့်၊ အရေးကြီးသည့် အချက်မှာ သက်ရှင်ကျန်ရစ်သူသည် ၎င်း၏ အတွေ့အကြုံအပေါ် မည်သို့ ခံစားရသနည်း ဟူသည့် အချက် ဖြစ်ပါသည်၊
- တစ်စုံတစ်ဦးက သင့်ကို ပြောပြသည့် အရာများကို သံသယဝင်ပါနှင့် သို့မဟုတ် ဆန့်ကျင်ဖြောပါနှင့်၊ သင်၏ အခန်းကဏ္ဍ/ တာဝန်မှာ ဝေဖန်ဆုံးဖြတ်သတ်မှတ်ချက်မရှိတဲ့ နားထောင်ပေးရန်နှင့် ရရှိနိုင်သော ဝန်ဆောင်မှုအကြောင်း သတင်းအချက်အလက်များ ပေးရန်သာ ဖြစ်ကြောင်း မမေ့ပါနှင့်၊

ပြောဆိုရမည့်စကား နမူနာများ ...

- "ကျန်တော်/ကျွန်မ ဘယ်လိုကူညီပေးရမလဲ။"
- "ကျွန်တော်/ကျွန်မတို့ကြားမှာ ပြောဆိုသမျှတိုင်း တခြား ဘယ်သူမှ မသိစေရပါဘူး။ သင့်ရဲ့ ခွင့်ပြုချက်မရတဲ့ ဘယ်သူ့ကိုမှ ဘာကိုမှ အသိပေးမှာ မဟုတ်ပါဘူး။"
- "သင့်ကို ကူညီဖို့ ကျွန်တော်/ကျွန်မ တတ်နိုင်သမျှ ကြိုးစားပေးပါမယ်၊ ဒါပေမဲ့ ကျွန်တော်/ကျွန်မက နှစ်သိမ့်ဆွေးနွေးပေးသူတစ်ဦး မဟုတ်ပါဘူး။ သင့်အတွက် ရရှိနိုင်မယ့် အကူအညီတွေနှင့် စပ်လျဉ်းတဲ့ ရှိသမျှ သတင်းအချက်အလက်တွေကို ကျွန်တော်/ကျွန်မ မျှဝေပေးပါမယ်။"
- "ပြောပြချင်တာမှန်သမျှ ပြောပြပေးပါ၊ ဒါပေမဲ့ သင် ကြုံတွေ့ခံစားခဲ့ရတာတွေကို ကျွန်တော်/ကျွန်မကို မပြောပြလည်း သင့်အတွက် ရရှိနိုင်မယ့် အကူအညီများနှင့် စပ်လျဉ်းတဲ့ သတင်းအချက်အလက်များကို မျှဝေပေးမှာ ဖြစ်ပါတယ်။"
- "သင် ကြုံတွေ့ခံစားခဲ့ရတာတွေအတွက် ကျွန်တော်/ကျွန်မ စိတ်မကောင်းပါဘူး။"
- "ဖြစ်ပျက်ခဲ့တာတွေက သင့်အပြစ် မဟုတ်ပါဘူး။"

ယာယီအဆောက်အဦးဆိုင်ရာအစုအဖွဲ့၏ GBV Constant Companion မှ ဆင်ခြေဖျန်းဆကဲ့သို့ပြန်လည်အစုံးဖြတ်ထားသည်

ချိတ်ဆက်ပေးပါ

ဆောင်ရန်

- ရှင်သန်ကျန်ရစ်သူ၏ ကိုယ်ဝိုင် ကိုယ်ပိုင်ဆုံးဖြတ်ပိုင်ခွင့်ကို လေးစားပါ။
- GBV အထူးပြုလေ့ရှိသည့် ဝန်ဆောင်မှု မဟုတ်ကျွင်ပင် ရရှိနိုင်သမျှ ဝန်ဆောင်မှုများအားလုံးနှင့် စပ်လျဉ်းသည့် သတင်းအချက်အလက်များကို ပွေ့ဖက်ပေးပါ။
- ရှင်သန်ကျန်ရစ်သူသည် ဆုံးဖြတ်ချက်များကို ယခု ချက်ချင်း ချမှတ်ရန် မလိုကြောင်း၊ သူ/သူမ အနေဖြင့် နောက်မှ စိတ်ပြောင်းပြီး အဆိုပါ ဝန်ဆောင်မှုများကို ရယူမည်ဆိုလျှင်လည်း ရနိုင်ကြောင်း ပြောပြပါ။
- ရှင်သန်ကျန်ရစ်သူမှ အကူအညီရယူရန် တစ်စုံတစ်ဦး၊ သူငယ်ချင်း၊ မိဘအုပ်ထိန်း၊ ပြုစုစောင့်ရှောက်ပေးသူ သို့မဟုတ် ၎င်း ယုံကြည်မှုရှိသည့် မည်သူမဆို ရှိပါသလားဟု မေးပြန်ပါ။
- အန္တရာယ်မရှိနိုင်ဟု သင်ခံစားရပါက ရှင်သန်ကျန်ရစ်သူမှ ယုံကြည်သူတစ်ဦးဦးဆီ ဆက်သွယ်ရန် သင်၏ ဖုန်း သို့မဟုတ် ဆက်သွယ်ရေးကိရိယာတစ်ခုကို သူ/သူမ ကို မေးသုံးပါ။
- မည်သည့်အရာကိုမဆို မလုပ်ဆောင်မီ အကြမ်းဖက်ခံရသူထံမှ ခွင့်ပြုချက်တောင်းခံပါ။
- လကားဝိုင်း သိမ်းသည့်အခါ ဖေးဖေးမမဖြင့် သိမ်းပေးပါ။

ရှောင်ရန်

- သင်၏ ကျွမ်းကျင်မှုများကို ချဲ့ကားမပြောပါနှင့်။ မဖြစ်နိုင်သည့် ကတိများ မပေးပါနှင့် သို့မဟုတ် သတင်းအချက်အလက် အမှားများ မပေးပါနှင့်။
- အကောင်းဆုံး လုပ်ဆောင်နိုင်မည့် အရာများ သို့မဟုတ် နောက်ထပ် ဘာလုပ်ရမည်ဆိုသည်များနှင့် စပ်လျဉ်း၍ သင်၏ကိုယ်ပိုင်အကြံဉာဏ်မပေးပါနှင့်။ သို့မဟုတ် ကိုယ်ပိုင်အမြင်များကို မပြောပါနှင့်။
- တစ်စုံတစ်ဦး၏ လိုအင်ဆန္ဒများ သို့မဟုတ် လိုအပ်ချက်များကို သင် သိရှိသည်ဟု တစ်ထစ်ချ မယူဆပါနှင့်။ အချို့သောလုပ်ဆောင်ချက်များသည် တစ်စုံတစ်ဦးကို ပြစ်တင်ရှုတ်ချခံရနိုင်သည့်၊ လာဘ်တံပြိန် ရန်ပြုခံရနိုင်သည့်၊ ဆိုးကျိုးဖြစ်စေပြီနိုင်သည့် အန္တရာယ်ကို ထပ်မံတိုးမွားစေနိုင်ပါသည်။
- တစ်စုံတစ်ဦး သို့မဟုတ် ၎င်း၏ အဝေ့အကြိုနှင့် စပ်လျဉ်း၍ သူ့ဆီ ချက်များ မပြုလုပ်ပါနှင့်။ အသက်အရွယ်၊ အိမ်ထောင်ရှိခြင်း/မရှိခြင်း၊ မသန်စွမ်းမှု၊ ကိုးကွယ်သည့်ဘာသာ၊ တိုင်းရင်းသားလူမျိုး အလွှာ၊ လိင်စိတ်ကိုင်ဆွဲတတ်မှု၊ လိင်ဝိသေသလံယူမှု၊ ကျူးလွန်သူ(များ)သည် မည်သူမည်ပါဟူသည်တို့ အပါအဝင် မည်သည်တို့အကြောင်းပြချို့မှု ခွဲခြားဆက်ဆံခြင်း မပြုပါနှင့်။
- GBV အကြမ်းဖက်မှုမှ ရှင်သန်ကျန်ရစ်သူတစ်ဦးနှင့် အခြား မည်သူမဆို (ဥပမာ - ကျူးလွန်သူ သို့မဟုတ် မိသားစုဝင်၊ ရပ်ရွာကော်မတီအဖွဲ့ဝင်၊ ရပ်ရွာ ခေါင်းဆောင်၊ စသည့် အခြားသူတစ်ဦးဦး)၏ ကြားတွင် ပြေငြိမ်းအာဏ် ဧဝေဝံပေးခြင်း၊ သင့်မြတ်အောင် လုပ်ပေးခြင်း၊ သို့မဟုတ် ဖြေရှင်းပေးခြင်း မပြုလုပ်ပါနှင့်။
- ဖြစ်ပျက်ခဲ့ပုံအဆေးစိတ်နှင့် ရှင်သန်ကျန်ရစ်သူ မည်သူမည်ပါဆိုသည်ကို ဖော်ပြနိုင်သည့် သတင်းအချက်အလက်များကို မည်သူ့ကိုမျှ မျှဝေပေးခြင်း မပြုပါနှင့်။ မည်သူ့ကိုမျှဟု ဆိုရာတွင် ရှင်သန်ကျန်ရစ်သူ၏ မိသားစုဝင်များ ရဲ/လုံခြုံရေး တပ်ဖွဲ့ ရပ်ရွာမှ ခေါင်းဆောင်များ လုပ်ဖော်ကိုင်ဖက်များ၊ မိဘ၏ ကြိုကြော့်သူအရာရှိများ၊ စသည်တို့လည်း အပါအဝင်ဖြစ်ပါသည်။ အဆိုပါ သတင်းအချက်အလက်များကို မျှဝေခြင်းသည် ရှင်သန်ကျန်ရစ်သူအပေါ် ဆိုးကျိုးများ ဂိုဂိုသက်ရောက်စေနိုင်ပါသည်။
- မိဘနှင့် ပြောဆိုဆွေးနွေးပြီးသည့် နောက်ပိုင်း တွင် ရှင်သန်ကျန်ရစ်သူအတြောင်း မေးမြန်းခြင်း သို့မဟုတ် ဆက်သွယ်ခြင်းများ မပြုလုပ်ပါနှင့်။

ချိတ်ဆက်ပေးပါ

ပြောဆိုရမည့်စကား နမူနာများ ...

- "ကျွန်တော်/ကျွန်မတို့ အခု ပြောတဲ့စကားတွေအတွက်လုံး တခြားဘယ်သူမှ မသိစေရပါဘူး၊"

- "ကျွန်တော်/ကျွန်မက နှစ်သိမ့်ဆွေးနွေးပေးသူတစ်ဦး မဟုတ်ပါဘူး၊ ဒါပေမဲ့ ကျွန်တော်/ကျွန်မမှာ ရှိတဲ့ သတင်း အချက်အလက်တွေကို သင့်ကို ပေးနိုင်ပါတယ်။ သင် ဒါမှမဟုတ် သင့်မိသားစု ဒါမှမဟုတ် သင်ရော၊ သင့်မိသားစုကိုရော ကူညီပေးနိုင်တဲ့ လူတချို့ / အဖွဲ့အစည်းတချို့ ရှိပါတယ်။ ဆုတို့အကြောင်း သိချင်ပါသလား၊"

- "ဒါတွေကတော့ ဝန်ဆောင်မှုရဲ့ အသေးစိတ်အချက်အလက်တွေပါ။ ဝန်ဆောင်မှု ပေးနေတဲ့ နေရာ၊ ဖွင့်လှစ်တဲ့အချိန်၊ ကုန်ကျစရိတ် (ရှိမည်ဆိုလျှင်) အဲဒီကို သွားဖို့အတွက် အသုံးပြုနိုင်တဲ့ သယ်ယူပို့ဆောင်ရေး နည်းလမ်းတွေ၊ သင် တွေ့ဆုံဆွေးနွေးနိုင်မယ့် လူရဲ့နာမည်၊ စတာတွေ ပါပါတယ်။"

- "သင် အကူအညီသွားတောင်းနိုင်တဲ့၊ သင် ယုံကြည်ရတဲ့သူတစ်ဦးဦး ရှိပါသလား။ ဥပမာ မိသားစုဝင် ဒါမှမဟုတ် သူငယ်ချင်း။ အခုအချိန်မှာ သင် လိုအပ်တဲ့သူတစ်ဦးဦးဆီ ဖုန်းဆက်ဖို့ ကျွန်တော်/ကျွန်မရဲ့ဖုန်းကို အသုံးပြုလိုပါသလား။"

- "ရှေ့ ဘာဆက်လုပ်မလဲဆိုတာနဲ့ပတ်သက်လို့ သင် ဆန္ဒရှိတဲ့အရာ၊ သင့်အတွက် သက်တောင့်သက်သာ ရှိတယ်လို့ ခံစားရတဲ့အရာကိုပဲ ထည့်သွင်းစဉ်စားဖို့ အရေးကြီးသုံး ဖြစ်ပါတယ်။"

- "အခုအချိန်မှာ ဆုံးဖြတ်ချက်တွေ ချရမယ်ဆိုပြီး စိတ်ဖိစီးမခံပါနဲ့။ လေသေချာချာ စဉ်းစားပြီး နောက်မှ စိတ်ပြောင်းချင်တယ်ဆိုလည်း ပြဿနာမရှိပါဘူး၊ ရပါတယ်။"

- "ဒီအခြေအနေကို ဖြေရှင်းဖို့အတွက် သင့်ကိုယ်စား သဘဝသူနဲ့မှ ကျွန်တော်/ကျွန်မ ဆွေးနွေးမပေးနိုင်ပါဘူး။ ဒါပေမဲ့ အခုကောင်းပြောနေစဉ်အတွင်းမှာ သင့်ကို ဖေးမကူညီပေးတာနဲ့ သင့်ရဲ့ဝိုးဆိုးပုပန်မှုတွေကို နားထောင်ပေးတာကိုတော့ ကျွန်တော်/ကျွန်မ လုပ်ပေးနိုင်ပါတယ်။"

- "သင် ပြောတာတွေ နားထောင်ကြည့်ရတာတော့ သင့်မှာ အစီအစဉ်တစ်ခု ရှိပုံရပါတယ်။ အဲဒါ အဲဒီလို အစီအစဉ်ရှိတာ သိပ်ကောင်းပါတယ်။"

Appendix 5. GBV pocket guide. This resource is taken from: www.gbvguidelines.org

ရှင်သန်ကျန်ရစ်သူဘက်မှ စဉ်းစားပေးခြင်း

ကူညီပံ့ပိုးမှုရယူခြင်းဆိုင်ရာ အကြီးအကဲများနှင့် အန္တရာယ်များ

ဝန်ဆောင်မှုများရယူခြင်းသည် ရှင်သန်ကျန်ရစ်သူ တစ်ဦးအတွက် အစဉ်အမြဲ ဘေးကင်းလုံခြုံစေသည် မဟုတ်ဘဲ ထိခိုက်မှုများ၊ ဆိုးကျိုးများ ပိုမို ဖြစ်ပေါ်စေနိုင်ပါသည်။ သင်၏တာဝန်မှာ ရရှိနိုင်သည့် ဝန်ဆောင်မှုများ အကြောင်း တိကျသည့် နောက်ဆုံးရ သတင်းအချက်အလက်များကို မျှဝေပေးရန်သာဖြစ်ကြောင်း မမေ့မလျော့ ရှိရန်လိုပြီး ရှင်သန်ကျန်ရစ်သူက ၎င်းအတွက် တေးအန္တရာယ်ကင်းရှင်းသည်ဟု ယူဆသည့်အရာကို ၎င်းတို့ ကိုယ်တိုင် ဆုံးဖြတ်ခွင့်ပြုပါ။ ဖောက်ပါ အကျိုးဒဏ္ဍာရီးနှင့် အန္တရာယ်များကို ထည့်သွင်းစဉ်းစားပါ။

ကူညီပံ့ပိုးမှုရယူခြင်း၏ အန္တရာယ်များ (လိုဂိုက်ဆုံးရှုံးနိုင်ခြေများ)

- ရှင်သန်ကျန်ရစ်သူ၏ မိတ်ဆွေသူငယ်ချင်းများ၊ မိသားစုဝင်ဟောင်းများနှင့်/သို့မဟုတ် ရပ်ရွာမှ သိရှိသွားနိုင်သည်။ ထိုအခါ ကဲ့ရဲ့ခြင်းတင်ရွတ်ချခြင်း၊ အိမ်မှ သို့မဟုတ် ရပ်ရွာမှ ဖောင်းထုတ်ခံရခြင်းနှင့်/သို့မဟုတ် အကြမ်းဖက်မှုများ ပိုမိုခံစားရခြင်းတို့ ဖြစ်လာနိုင်ပါသည်။
- ဖြစ်ပျက်ခဲ့သည်များကို အခြားသူများ သိရှိသွားပြီး ဆိုသည်ကို ကျူးလွန်သူ(များ) သိရှိသွားနိုင်သည်။ ထို့အခါ ရှင်သန်ကျန်ရစ်သူကို ထိခိုက်နာကျင်အောင်လုပ်ခြင်း၊ သို့မဟုတ် သတ်ပစ်ခြင်းကိုဝင် လုပ်ဆောင်ရှိလက်တုံ့ပြန်နိုင်ပါသည်။
- ဝန်ဆောင်မှုပေးသူများက ရှင်သန်ကျန်ရစ်သူတစ်ဦးကို ကူညီနေသည်ကို မြင်တွေ့ပါက ကျူးလွန်သူ သို့မဟုတ် ရပ်ရွာမှ ဝန်ဆောင်မှုပေးသူများကို ပြဿနာဖြေရှင်းခြင်းများ၊ အကြမ်းဖက်ခြင်းများ ပြုလုပ်နိုင်ပါသည်။
- ဝန်ဆောင်မှုပေးသူများသည် စနစ်တကျ သင်တန်းရထားသူများ မဟုတ်လျှင် နားလည်စာနာမှုမရှိသည့် တုံ့ပြန်ဆောင်ရွက်မှုမျိုးကို ပြုလုပ်နိုင်ပါသည်။

ကူညီပံ့ပိုးမှုရယူခြင်း၏ အကျိုးကျေးဇူးများ

- အသက်အန္တရာယ်ရှိသည့် အခြေအနေတွင် အသက်ကယ်ဝန်ဆောင်မှုများကို ရရှိနိုင်ခြင်း။
- HIV နှင့် လေ့ရှင်ဘဲရသည့် ကိုယ်ဝန်ကို တားဆီးပေးနိုင်သည့် ဘေးကင်းလုံခြုံမှုရှိ လျှို့ဝှက်ထိန်းသိမ်းပေးသော ကျွမ်းကျင်သည့် ဆေးကုသစောင့်ရှောက်မှုများကို အချိန်မီ ရရှိနိုင်ခြင်း။
- ဘေးကင်းလုံခြုံရေးနှင့် စိတ်လုံခြုံရေး ကူညီပံ့ပိုးမှုများ အပါအဝင် ဝုဏ်သိက္ခာနှင့် သက်တောင့်သက်သာရှိမှုတို့ ပိုမိုရရှိအောင် ဆောင်ရွက်ပေးနိုင်သည့် အခြားဝန်ဆောင်မှုများ ရရှိနိုင်ခြင်း။
- အကြမ်းဖက်မှုများ နောက်ထပ် မဖြစ်ပွားအောင် တားဆီးကာကွယ်ပေးနိုင်သည့် ကူညီပံ့ပိုးမှုများကို ရရှိနိုင်ခြင်း

> လုံထားရင်းစာနာထောက်ထားမှုလုပ်ဝန်းများ လုပ်ဆောင်သူထဲ့ဦး ဘို့မဟုတ် လူထားရင်း စာနာထောက်ထားမှု ဆက္ခအညီများနှင့် ဆက်နွယ်ဝတ် သက်နေသူတစ်ဦးမှ ကျူးလွန်သော လိင်ပိုင်းဆိုင်ရာ ဖေါင်းမှုံထိတ် အမြတ်ထုတ်ခြင်းနှင့် ထပေါ် ဖထားမှု ဖလျော့ကောန် ပြုမှုခြင်း
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> လိင်မှုဆိုင်ရာ ဖေါင်းမှုံခြင်းသဖြင့်ထုတ်ခြင်းနှင့် မဖတ်မဖားများ မလျော်မကန်ပြုမှုခြင်းမှ ကာကွယ်ဖေးမှုရောက်ပေးခြင်း (PSEA) ဆိုးဝင်ဉာဏ်မှာ ထိခိုက်လွယ်သောသူများကို လူသားချင်းစာနာ ထောက်ထားမှုလုပ်ငန်း လုပ်ဆောင်းသူများ ဘို့မဟုတ် ဖအောက်ပါတို့အပါအဝင် အခြားဆက်နွယ်ပတ်သက်သောသူများ၊ ဝန်ထမ်းများက ကျူးလွန်သည့် လိင်မှုဆိုင်ရာ ဖေါင်းမှုံခြင်းအပြင်ထုတ်ခြင်းနှင့် မဖတ်မဖားများ မလျော်မကန်ပြုမှုခြင်း ကာကွယ်ဖောင့်ရောက်ပေးရန် လုပ်ဆောင်ရမည့်လုပ်ငန်း အထွေ့ဆုံးကို ရှင်းပြန်းသော အသုံးအနှုန်းထစ်ရ ဖြစ်ပါသည်။
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> - လူထားရင်းစာနာထောက်ထားမှု အကူအညီပေးသည့် လုပ်ဘားများ၊ စေထားနှာဝန်ထမ်းများ လုံခြုံရေးဝန်ထမ်း/ဘဏောင့်များ၊ ကန်ထရိုက်စာချုပ်ဖြင့် လုပ်ငန်းဆောင်ရွက်ကြသူများ။ ယာဉ်မောင်းများ၊ UN ဓစ်ရှင်ဝန်ထမ်းများ၊ UN ရိုဝန်ထမ်းများ၊ ဖြိုခဲ့ချမ်းရေးတပ်ဖွဲ့များ၊ လူထားရင်း စာနာထောက်ထားမှုဆိုင်ရာ ရည်ရွယ်ချက်များအတွက် ကုန်ပစ္စည်းနှင့် ဝန်ဆောင်မှုများကို ပေးသွင်းသူများ။ စသည်တို့ ဖြစ်ပါသည်။ ကျူးလွန်လူဟည် မည်သူမဆိုစေ ကျွဲဒီတိ်ဆောင်းလက်စွဲထဲတွင် ဖော်ပြထားသည့် GBV အကြမ်းဖက်မှုမှ ရှင်သန်ကျန်ရစ်သူများကို ကူညီပံ့ပိုးခြင်း၊ လမ်းမြုံမြေပုံးသည် အကူအညီ ဖြစ်ပါသည်။ ကျူးလွန်ဘူသည့် လူထားရင်းစာနာထောက်ထားမှု အကူအညီပေးရေးဝန်ထမ်း ဘို့မဟုတ် ဆက်နွယ်ပတ်သက်နေသူတစ်ဦး ဖြစ်လျှင် ထုပ်ဆောင်း တာဝန်ပုရမည့် ကိစ္စများအတွက် သင်၏ PSEA တာဝန်ခံ ဘို့မဟုတ် နိုင်ငံတွင်းရှိ PSEA ကွန်ရက်နှင့် ဆက်သွယ်ပါ။

ဖြင့်ဆင်ပါ

ကြိုတင်ဖြင့်ဆင်မှုသည် အဓိကထောက်ချက် ဖြစ်ပါသည်။ မိမိ၏ ဒေသတွင် GBV လုပ်ဆောင်သူတစ်ဦး (GBV လွှဲပြောင်းညွှန်းပို့မှု လမ်းကြောင်းတစ်ခု သို့မဟုတ် GBV တာဝန်ခံတစ်ဦး အပါအဝင်) မရှိလျှင်ပင် ဒေသန္တရ အဆင့်/ရပ်ရွာအဆင့်မှ အပါအဝင် ရရှိနိုင်သည်၊ ရှင်သန် ကျန်ရစ်သူတစ်ဦး၏ လိုအပ်ချက်များကို ကူညီဖြည့်ဆည်းပေးနိုင်သည်၊ အခြားသောဝန်ဆောင်မှုများ ရှိနိုင်ပါသည်။ သင်အနေဖြင့် သင်ထင်ထားသည်ထက် ပိုများသော ဝန်ဆောင်မှုများကို သိရှိနေနိုင်ပါသည်။

ရရှိနိုင်သော ဝန်ဆောင်မှုများကို သိရှိအောင် လုပ်ဆောင်ခြင်း

- ဝန်ဆောင်မှု သတင်းအချက်အလက် စာရွက် (စာမျက်နှာ ၅ နှင့် ၆) ကို အသုံးပြုကာ ရရှိနိုင်သော ဝန်ဆောင်မှုများကို ဖြည့်စွက်၍ စာရင်းပြုစုပါ။ ထိုအတွက် သင်၏ GBV ကျွမ်းကျင်ဝညာရှင်၊ သင်၏ အဖွဲ့ ခေါင်းဆောင်၊ လုပ်ဖော်ကိုင်ဖက်များ။ အခြား မိတ်ဖက်များနှင့်အတူတကွ ပူးပေါင်းလုပ်ဆောင်ပါ။ ဘယ်ကိုသွားရမည်၊ ဘယ်သူနှင့် ဆက်သွယ်ရမည်၊ ဘယ်သူတွေ ဆက်သွယ်နိုင်သည်/မဆက်သွယ်နိုင် (ဥပမာ အမျိုးသမီးများသာ၊ အထောက်အထား စာရွက်စာတမ်းများ လိုအပ်၊ စသည်) ဟူသည်တို့ အပါအဝင် အဆိုပါ ဝန်ဆောင်မှုများကို ရယူနိုင်ရန်အတွက် လိုအပ်သော သတင်းအချက်အလက်များကို ထည့်သွင်းဖေးသားထားပါ။
- သင်၏ အဖွဲ့ခေါင်းဆောင်၊ စီမံကိန်းမန်နေဂျာနှင့်/သို့မဟုတ် အစုအဖွဲ့/တက္ကသိုလ် ညီနွှိုင်းဖေးမှုဖြစ်ထံမှ လိင်မှုဆိုင်ရာ ဖေါင်းမှုံခြင်းအမြတ်ထုတ်ခြင်းနှင့် အနိုင်အထက်ပြုခြင်းအတွက် လုပ်ငန်းလမ်းညွှန်များ၊ ကျင့်ဝတ်များ၊ လုပ်ထုံးလုပ်နည်းများကို တောင်းခံပါ။ သင်၏ အဖွဲ့အစည်းတွင် ချမှတ်ထားသော PSEA လုပ်ငန်းလမ်းညွှန်များ မရှိပါက သင့်ဒေသ/နိုင်ငံအတွက် တာဝန်ယူထားသည့် PSEA တာဝန်ခံထံ ဆက်သွယ်၍ လမ်းညွှန်ချက်များ တောင်းခံရန် စဉ်းစားပါ။

အထပ်ထပ်လေ့ကျင့်မှ ကျွမ်းကျင်လာမည်

- စာမျက်နှာ ၇ - ၁၀ ရှိ ဖြေဆိုရမည့် စကားနမူနာများကို အဆင်ပြေလွယ်ကူစွာ ဖြေနိုင်အောင် လုပ်ထားပါ။ အသံထွက်၍ ဖြေဆိုလေ့ကျင့်ပါ သို့မဟုတ် လုပ်ဖော်ကိုင်ဖက်များ။ သူငယ်ချင်းများနှင့် လေ့ကျင့်ပါ။ အလေ့အကျင့်များလေ၊ ကျွမ်းကျင်လေဖြစ်ပြီး GBV အကြမ်းဖက်မှုမှ ရှင်သန်ကျန်ရစ်သူတစ်ဦး သင်၏ အကူအညီဖတောင်းခံလာလျှင် သင်သည် ပို၍ အဆင်ပြေပြေ ဖြေဆိုနိုင်မည်ဖြစ်ပါသည်။
- အထောက်အကူပြု စာရွက်စာတမ်းများကို သင် လေ့ကျင့်နိုင်မည့် နည်းလမ်းများ ပိုမို သိရှိနိုင်ရန် အသုံးပြုသူအတွက် အကြံပြုချက်များ၊ လက်စွဲစာအုပ်ကို ဖတ်ရှုနိုင်ပါသည်။
- အီတိုဖောင်လမ်းညွှန်သည် စက်ခဲသည့် အခြေအနေတစ်ရပ်တို့ ရင်ဆိုင်ဖြတ်ကျော်ရသူတိုင်းအတွက် အထောက်အကူပြုနိုင်သော လမ်းညွှန်စာအုပ် ဖြစ်ပါသည်။ နောက်တစ်ကြိမ် သင်၏ လုပ်ဖော်ကိုင်ဖက် သို့မဟုတ် မိတ်ဆွေတ သင့်ထံမှ အကူအညီ သို့မဟုတ် အကြံဉာဏ် လာရောက် တောင်းခံပါက ဤစာအုပ်ထဲရှိ မေးခွန်းများ၊ စကားများကို လေ့ကျင့်အသုံးပြုကြည့်ပါ။

ကြည့်ရှုပါ

တစ်စုံတစ်ဦးဆည် ၎င်းတို့ ရင်ဆိုင်ကြုံတွေ့ခဲ့ရသော ကျူးဆေးမြေပြေ အကြမ်းဖက်မှုအကြောင်းကို သင့်ထံ ဖွင့်ဟ ဖေါပြလာသောအခါ ...

ဆင့်ကိုယ်အင် မိတ်ဆက်ပါ

- သင်၏ အမည်၊ တာဝန်နှင့် သင် မည်သည့်ဖြစ်ကြောင်း မိတ်ဆက်ပါ၊ သင် မည်သို့ ကူညီပေးရမည်ဆိုသည်ကို ဖေးမြန်းပါ။
- အရေးကြီးဖြင့်ဆုံးဖြတ်ပေးရမည့် အမြေခံလိုအပ်ချက်များကို ဖြည့်ဆည်းပေးနိုင်ရန် လုပ်ဆောင်ပါ။
- လူထုဝိုင်းဝန်းတိုင်၏ အခြေခံလိုအပ်ချက်များဆည် ထူးခြားမည်မဟုတ်ပါ၊ အခြေခံလိုအပ်ချက်များဟု ဆိုရာတွင် အရေးပေါ် ဆေးကုသစောင့်ရှောက်မှု၊ ရေ၊ ရှစ်ဆင်းရဆုတစ်ဦးကို ရှာဖွေပေးရန်၊ ဘို့မဟုတ် စောင် ဘို့မဟုတ် အဝတ်အစားများ (ယောကျ်ဖုံး၊ စုတ်ပြဲ၊ ပုန်းဆပ ဘို့မဟုတ် ဖယ်ရှားရလွယ်) တို့ ပါဝင်ပါသည်။ အထူးသဖြင့် GBV အကြမ်းဖက်မှုမှ ရှင်သန်ကျန်ရစ်သူများအတွက် သက်တောင့်သက်သာရှိပြီး ဂုဏ်သိက္ခာရှိသည်ဟု ခံစားရလုန်အတွက် အဓိကကျသည့် အရေးဆပါ လိုအပ်ချက်မှာ အပေတ်အစားများ ဖြစ်ပါသည်။

- ရှင်သန်ကျန်ရစ်သူအား ၎င်း၏ ဘေးကင်းမှုနှင့် လုံခြုံမှုအတွက် ၎င်း စဉ်းစားရသည့်အတိုင်း ပြောခွင့်ပြုပါ၊ သင် တွေ့မြင်နေရသည်များပေါ် အခြေခံကာ ထင်မြင်ချက် / ယူဆချက်များ မပေးရန် သတိပြုပါ။

လူများ၏အကူအညီရယူလေ့ရှိသည့် နည်းလမ်း အမျိုးမျိုးကို သိရှိအောင် လုပ်ထားပါ။

- ရှင်သန်ကျန်ရစ်သူများကို ၎င်းတို့၏ စိတ်ခံစားချက်များအား မည်သည့်ပုံစံဖြင့်ဖြစ်စေ ဖော်ပြခွင့်ပြုပါ၊ လူများ၏ စိတ်ဖိစီးမှုများနှင့် အကျပ်အတည်းများကို တုံ့ပြန်သည့် ပုံစံများသည် များစွာမတူ ကွဲပြားကြပါသည်၊ အချို့သူများသည် တိတ်ဆိတ်ငြိမ်သက်၍ စကားမပြောနိုင်ကြပါ၊ အချို့မှာမူ ဒေါသထွက် ဒေါ်တစ်ကြသည်၊ အချို့က ဖြစ်ပျက်ခဲ့သည်များအတွက် မိမိကိုယ်ကို အပြစ်တင်ကြသည်၊ ငိုယိုကြသည်၊ အကြမ်းဖက်ကြသည်၊ စသဖြင့် ပုံစံမျိုးစုံ ရှိပါသည်၊

- မသန်စွမ်းသူများ၊ အခြားဘာသာစကားတစ်ခု ပြောဆိုသူများနှင့် အကူအညီတောင်းခံရယူသောအခါ အတားအဆီးအမျိုးမျိုးကို ရင်ဆိုင်ကြ တွေ့ရသူများ - ထိုသူများကို နားထောင်ပေးရန်နှင့် ကူညီပေးရန် နည်းလမ်းများ ရှာဖွေသောအခါ ကျားမရေးရာအခြေပြု ရှင်သန်ကျန်ရစ်သူအား ဗဟိုပြုသည့် အခြေခံစည်းမျဉ်းများနှင့် အချက်အလက်များအား လျှို့ဝှက်စွာ ထိန်းသိမ်းပေးမှုတို့ကို စောင့်ထိန်းလိုက်နာပါ၊ တစ်စုံတစ်ဦး ပြောသော စကားကို သင် နားမလည်သည့်တိုင် ဂရုစိုက်မှုနှင့် ဖေးမမှုတို့ကို ပြသနိုင်ပါသည်၊

- ကူညီပံ့ပိုးမှုများ ပေးရာတွင် အမျိုးသမီး ဝန်ထမ်းများ ရှိနေအောင် ဆောင်ရွက်ထားပါ၊ အထူးသဖြင့် ယဉ်ကျေးမှုအရ အမျိုးသမီးများနှင့် မိန်းကလေးငယ်များကို အမျိုးသားများနှင့် ထိတွေ့ဆက်ဆံခြင်းကို ခွင့်မပြုသော အခြေအနေများတွင် ဖြစ်သည်၊

သင် ဘာကို စီမံဆောင်ရွက်နိုင်သည်၊ ဘာကို မဆောင်ရွက်နိုင်ဆိုသည်ကို လက်ခံအသိအမှတ်ပြုပါ၊

- တစ်ခါတစ်ရံ သင်၏ တာဝန်ထက် ကျော်လွန်သည့် အထူးပြု ပံ့ပိုးဝန်ဆောင်မှုများ လိုအပ်သည့် အခြေအနေများလည်း ရှိနိုင်ပါသည်၊ ဥပမာ ကလေးများ ပါဝင်ပတ်သက်သည့် အခြေအနေများ၊ မဖြစ်မနေ သတင်းပို့ရမည့် အမှုကိစ္စများ၊ ရှင်သန်ကျန်ရစ်သူ အန္တရာယ်ကျရောက်တော့မည်ဆဲဆဲ အခြေအနေများ၊ ရှင်သန်ကျန်ရစ်သူသည် ၎င်း၊ ကိုယ်ကို သို့မဟုတ် အခြားသူများကို ရန်ပြုနိုင်သည့် အခြေအနေများ ဖြစ်ပါသည်၊ အဆိုပါအခြေအနေ တစ်ခုတွင် ပိုမိုကောင်းမွန်သော ပံ့ပိုးကူညီမှုများကို ပေးနိုင်စွမ်းရှိသည့် အခြား တာဝန်ခံများ ရှိနိုင်ပါသည်၊ သင်၏ ဝန်ဆောင်မှုသတင်းအချက်အလက်စာရွက် (စာမျက်နှာ ၅ နှင့် ၆) ကို ပြန်ကြည့်ပါ၊

> သင်သည် ကြီးကြပ်သူအရာရှိ သို့မဟုတ် အခြား လူသားချင်းစာနာထောက်ထားမှု လုပ်ငန်း လုပ်ဆောင်သူထံမှ ကူညီပံ့ပိုးမှုကို ရယူလိုသည့်အခါတိုင်း ရှင်သန်ကျန်ရစ်သူထံမှ ခွင့်ပြုချက်ကို ဦးစွာတောင်းခံရန် မမေ့ပါနှင့်၊ သင် မည်သူနှင့် တိုင်ပင်ဆွေးနွေးလိုသည်၊ အဘယ်ကြောင့် ထိုသူနှင့် တိုင်ပင်ဆွေးနွေးလိုသည်၊ မည်သည့်သတင်းအချက်အလက်များကို မျှဝေပေးလိုသည် ဆိုသည်တို့ကို ရှင်သန်ကျန်ရစ်သူကို ပြောပြပါ၊ ရှင်သန်ကျန်ရစ်သူက ၎င်း၏ သတင်းအချက်အလက်များ မျှဝေခြင်းကို စိတ်သက်တောင့်သက်သာ မဖြစ်လျှင် သို့မဟုတ် အတိအလင်းငြင်းဆိုလျှင် ဤအိတ်ဆောင်လက်စွဲထဲတွင် ရှိသော နည်းလမ်းအထောက်အကူများ (tools) ကို အသုံးပြု၍ တတ်နိုင်သမျှ ကူညီပေးပါ၊

ထုတ်မှတ်ထားသော ဖြစ်စဉ်/အမှုများအတွက် မဖြစ်မနေ သတင်းပို့ရန် စည်းမျဉ်းစည်းကမ်းများ ရှိပါသည်၊ ပိုမိုလိုအပ်သော သတင်းအချက်အလက်များနှင့် လမ်းညွှန်မှုများအတွက် အဝ်နေရာဒေသရှိ ကာကွယ်စောင့်ရှောက်ရေးဆိုင်ရာ တာဝန်ရှိသူနှင့်/သို့ ကျား/မ အခြေပြုအကြမ်းဖက်မှုဆိုင်ရာ ပေါ်လာ တတ်ကျွမ်းသူနှင့် တိုင်ပင်ပါ၊

နားထောင်ပါ

ရှင်သန်ကျန်ရစ်သူ၏ အခြေခံလိုအပ်ချက်များကို ဖြည့်ဆည်းပေးပြီးနောက် သူ/သူမထံတွင် ချက်ချင်းလက်ငင်း ကျရောက်နိုင်သည့် အန္တရာယ် မရှိပါက နားထောင်ပေးပါ၊

ရှင်သန်ကျန်ရစ်သူသည် အလွန်အမင်း စိတ်ဆင်းရဲခြင်း သို့မဟုတ် စိတ်ရှုပ်ထွေးခြင်း သို့မဟုတ် နှစ်မျိုးစလုံး ဖြစ်နေနိုင်ပါသည်၊ သို့သော် ၎င်းကို ကူညီပေးနေသူသည် တတ်နိုင်သမျှ အေးအေးဆေးဆေးတည်ငြိမ်မှုရှိဖို့ အရေးကြီးပါသည်၊ သူ/သူမ ပြောပြချင်သမျှ ပြောခွင့်ပြုပြီး မပြောချင်လျှင်လည်း မပြောဘဲ နေခွင့်ပြုပါ၊ နှစ်သိမ့်ဆွေးနွေးပေးရန်၊ ရှင်သန်ကျန်ရစ်သူကို ဝန်ဆောင်မှုများ ဆောင်ရွက်ပေးနေရာသို့ ခေါ်ဆောင်သွားပေးရန် သို့မဟုတ် ဖြစ်ပျက်ခဲ့သည်များကို အသေးစိတ်မေးမြန်းရန်တို့မှာ သင်၏ တာဝန်မဟုတ်ပါ၊ အဖြစ်အပျက်အကြောင်း အသေးစိတ်မေးခွန်းများ မေးမြန်းခြင်းထက် သင်သိရှိထားသည့် ရရှိနိုင်သော ဝန်ဆောင်မှုများအကြောင်း သတင်းအချက်အလက်များ ၎င်းတို့ထံ ပေးအပ်နိုင်ရေးကိုသာ အာရုံစိုက်ပါ၊ အကြံပြုချက် - ပုံမှန်အားဖြင့် မေးခွန်းများ မေးမြန်းခြင်းကို ရှောင်ရှားနိုင်လျှင် အကောင်းဆုံးဖြစ်သည်၊ အထူးသဖြင့် "ဘာကြောင့်" နှင့် စသော မေးခွန်းများကို ရှောင်ပါ၊ ထိုမေးခွန်းများသည် ရှင်သန်ကျန်ရစ်သူကို အပြစ်ဖို့နေသကဲ့သို့ ခံစားရစေနိုင်သော မေးခွန်းများ ဖြစ်သည်၊ မေးခွန်းများမေးမည့်အစား နားထောင်ရုံသာ နားထောင်ပေးပါ၊ သို့မဟုတ် အချို့နေရာဒေသများ၊ အခြေအနေများတွင် အချို့အမှုကိစ္စ အမျိုးအစားများကို မဖြစ်မနေ သတင်းပို့ရမည်ဟူသည့် စည်းမျဉ်းစည်းကမ်းများ ရှိတတ်သည်၊ ထို့အတွက် သတင်းအချက်အလက်နှင့် လမ်းညွှန်မှုများ ရယူရန် သင်၏ ကာကွယ်စောင့်ရှောက်မှု တာဝန်ခံ သို့မဟုတ် GBV ကျွမ်းကျင်ပညာရှင် သို့မဟုတ် နှစ်ဦးစလုံးနှင့် ဆက်သွယ်မေးမြန်းပါ၊

လိုအပ်ပါက "သင့်ကို အကူအညီပေးနိုင်မယ့် ရရှိနိုင်တဲ့ ဝန်ဆောင်မှုတွေ အကြောင်း ပြောပြပေးရမလား" သို့မဟုတ် "ကျွန်တော်/ကျွန်မအနေနဲ့ သင့်ကို ဘယ်လိုကူညီပေးရမလဲ" ဟူသည့် မေးခွန်းမျိုးကို မေးပါ၊

> **နားထောင်ပေးခြင်း၏ စွမ်းပကား**
>
> တစ်ခါတစ်ရံ သင့်အနေဖြင့် သက်ရှင်ကျန်ရစ်သူတစ်ဦးအတွက် ရရှိနိုင်သည့် ဝန်ဆောင်မှုများ သို့မဟုတ် အရင်းအမြစ်များကို မျှဝေပေးရန် လုံးဝမရှိသည့် အခြေအနေမျိုးတွင် ရောက်ရှိနေနိုင်ပါသည်၊ သင့်အနေဖြင့် အကူအညီ ကင်းမဲ့နေသကဲ့သို့ ခံစားရနိုင်သည်၊ သို့သော် သင်သည် အကြမ်းဖက်ခံရသူ၏ တွေ့ကြုံခံစားခဲ့ရမှုများကို သင့်အား ပြောပြရဲသည့် သတ္တိကို အသိအမှတ်ပြုကာ ၎င်းအပေါ် ရှိသားဖို့ အရေးကြီးသည်၊ သင့်အနေဖြင့် ၎င်းကို ယခုထက်ပို၍ ကူညီပေးနိုင်ခြင်း မရှိသည့်အတွက် ဝမ်းနည်းကြောင်း ပြောပါ၊ သင်နှင့် စကားပြောနေချိန် တစ်လျှောက်လုံးတွင် အကြမ်းဖက်ခံရသူ ဂုဏ်သိက္ခာရှိရေး တတ်နိုင်သမျှ အလေးထား ဆောင်ရွက်ပေးပါ၊ စိတ်ဝင်တစား နားထောင်ပေးကြောင်း ပြသ၍ အတူရှိနေပေးခြင်းကပင် လျှင် ကူညီပံ့ပိုးပေးနေခြင်း ဖြစ်ပါသည်၊

ချိတ်ဆက်ပေးပါ

ရှင်သန်ကျန်ရစ်သူ ရှေ့ဆက်ဆောင်ရွက်ရမည့် အရာများအတွက် ဆုံးဖြတ်ချက်များ ချမှတ်နိုင်အောင် ကူညီပံ့ပိုးပေးနေရင်း . . .

ရှင်သန်ကျန်ရစ်သူထံတွင် အကူအညီ သွားရောက် တောင်းခံရန် သူ/သူမ ယုံကြည်ရသောသူ တစ်ဦးဦး ရှိပါသလားဟု မေးမြန်းပါ၊

အသက် ၁၈ နှစ်အောက် ကလေးများနှင့် ဆယ်ကျော်သက်များကို ကူညီပံ့ပိုးခြင်း

အဓိကပေးလိုထား သတင်းစကားများ

---> (၁) သင်၏ နေ့ရာဒေသတွင် ရရှိနိုင်သည့် ဝန်ဆောင်မှုများ။ (၂) ဒေသအတွက် ချမှတ်ထားသည့် လုပ်ငန်းလမ်းညွှန်များ။ ကျင့်ဝတ်များနှင့် လုပ်ထုံးလုပ်နည်းများကို နားလည်သဘောပေါက်ရန် သင့်နိုင်ငံ/ဒေသရှိ GBV သို့မဟုတ် ကလေးသူငယ် ကာကွယ်စောင့်ရှောက်မှု ကျွမ်းကျင်ပညာရှင် တစ်ဦးနှင့် ဦးစွာ အစည်းအဝေး ဆွေးနွေးပါ။

---> ထိခိုက်နစ်နာမှု မရှိပါစေနှင့် - ရှင်သန်ကျန်ရစ်သူ ကလေးသူငယ်များကို သိရှိအောင် ရှာဖွေဖော်ထုတ်ခြင်း မပြုပါနှင့်။ ကလေးငယ်/ဆယ်ကျော်သက် တစ်ဦး၊ အကြမ်းဖက်မှု တွေ့ကြုံခံစားခဲ့ရခြင်း ဖြစ်ဖြေရှင်းကို စုံစမ်းစစ်ဆေးရန် သို့မဟုတ် အကဲဖြတ်ဆန်းစစ်ရန်မှာ သင့်တာဝန်မဟုတ်ပါ။ ထိုသို့ ပြုလုပ်ခြင်းများက ကလေးငယ် / ဆယ်ကျော်သက်အတွက် အကြမ်းဖက်မှုများ။ ထိခိုက်ဆုံးရှုံးနိုင်ခြေများ ပိုမို တိုးပွားလာစေနိုင်ပါသည်။ ကလေးငယ်/ ဆယ်ကျော်သက်တစ်ဦးက သင့်ထံမှ အကူအညီတောင်းခံလို ပါကမူ အလွယ်တကူ ချဉ်းကပ်နိုင်ရအောင် အသင့်ရှိနေပေးပါ။

---> သင်၏ အခန်းကဏ္ဍကို မဖေ့လျော်ပါနှင့် - ကလေးငယ်/ဆယ်ကျော်သက်တစ်ဦးက အကူအညီတောင်းခံရန် သင့်ထံ ဆက်သွယ်လာသောအခါ -

၁၊ ဝေဖန်ဆုံးဖြတ်သတ်မှတ်ခြင်းကင်းစွာ နားထောင်ပေးပါ။

၂၊ ကလေးငယ်/ဆယ်ကျော်သက်က ၎င်းကို အန္တရာယ်ပေးနိုင်တဲ့ယုံကြည်စိတ်ချရသူအဖြစ် သတ်မှတ်သည့် လူကြီးတစ်ဦးနှင့် ချိတ်ဆက်ပေးခြင်းဖြင့် ကူညီပံ့ပိုးပေးပါ။ ထိုသူသည် ၎င်း တို့၏ မိဘ၊ ပြုစုစောင့်ရှောက်သူ သို့မဟုတ် မိသားစုဝင် ဖြစ်ရင်မှ ဖြစ်ပါလိမ့်မည်။

၃၊ ကလေးငယ်/ဆယ်ကျော်သက်က သင်နှင့် စကား၊ ပြောဆိုနေစဉ်တွင် သူ/သူ၏ ပြုစုစောင့်ရှောက်သူ သို့မဟုတ် အခြားမည်သူမဆိုအား ၎င်းနှင့် အတူရှိနေခြင်းကို လက်ခံရန် မိအား ပေးခြင်း အပါအဝင် သူ/သူအတွက် ဆုံးဖြတ်ချက်များ ချခွေးပေးပါနှင့်။

---> သက်တောင့်သက်သာရှိအောင် လုပ်ပေးပါ - ကလေးငယ်/ဆယ်ကျော်သက်ကို ဦးဆောင်ပြောခွင့်ပြုပါ။ မိမိက ဘာမျှမပြောဘဲ ထားတွင် ရှိနေပေးခြင်း သက်သက်လည်း ဖြစ်နိုင်ပါသည်။ ကလေးငယ်/ဆယ်ကျော်သက်သည် ရင်ဖွင့်လိုသည့် ဆန္ဒရှိလျှင် ဆင့်ကို ရင်ဖွင့်နိုင်ကြောင်း၊ ပြသရန်အတွက် ချက်လုံးချင်းတစ်တန်းတည်း၊ ဖြစ်သည့် အခန်းအထားတွင် လမ်းဖွင့်ပေးထား၊ သည့် ကိုယ်တန်အမူအရာ ပြသပါ။ ဘာဖြစ်ခဲ့သည်၊ ဘယ်သူက၊ ဘာကြောင့်ဟူသည့် စေးခွန်းများ မေးမြန်းခြင်းကို ရှောင်ရှားပါ။ ထိုအစား နှစ်သိမ့်မှု ဖြစ်စေမည့် စကားများကို ပြောပါ။ ၎င်းတို့ နားလည်နိုင်မည့် အမူအရာဖြင့် ပြောပါ။

သတိပြုရန်မှာ - သင်၏ ဒေသတွင် GBV သို့မဟုတ် ကလေးငယ်/ကာကွယ်စောင့်ရှောက်မှု လုပ်ဆောင်သူ/ လွှဲပြောင်းညွှန်းမှုမှ လမ်းကြောင်းရှိပါက ကလေးငယ်/ဆယ်ကျော်သက်ကို ပိုမို ထိရောက်ကောင်းမွန်မှုသော အကူအညီများ ပေးနိုင်မည့် ကျွမ်းကျင်ပညာရှင်တစ်ဦးထံ ဒေသာင်း လုံခြုံစွာ၊ လျှို့ဝှက်ဆိုင်းငံမှုရှိစွာ လွှဲပြောင်းညွှန်းပို့နိုင်အောင် ကူညီပံ့ပိုးပေးပါ။

သင်၏ ဒေသတွင် GBV သို့မဟုတ် ကလေးငယ်ကာကွယ်စောင့်ရှောက်မှု လုပ်ဆောင်သူ/ လွှဲပြောင်းညွှန်းမှုမှ လမ်းကြောင်းမရှိပါက ဤလမ်းညွှန်ကို အသုံးမပြုပါ။

(၁) လျှို့ဝှက်ထိန်းသိမ်းမှုဆိုင်ရာ ကန့်သတ်ချက်များနှင့် (၂) အာဏာပေးဆားဆော GBV နှင့် ကလေးငယ်ကာကွယ်စောင့်ရှောက်မှုတာဝန်ခံများအပါအဝင် နိုင်ငံတွင်းရှိသင်၏ GBV သို့မဟုတ် ကလေးငယ်ကာကွယ်စောင့်ရှောက်မှုတာဝန်ပိတို့ ဆက်သွယ်၍ ဒေသအတွက် ချမှတ်ထားသော လုပ်ငန်းလမ်းညွှန်များ၊ ကျင့်ဝတ်များနှင့် လုပ်ထုံးလုပ်နည်းများအကြောင်းကို မေးမြန်းပါ။

(၁)လျှို့ဝှက်ထိန်းထိန်းမှုဆိုင်ရာကန့်သတ်ချက်များ (၂) ဆက်သွယ်ထားဆော ကများ မ အခြေခြေအကြမ်းဖက်မှုနှင့် ကာကွယ်စောင့်ရှောက်မှုဆိုင်ရာ တာဝန်ရှိသူ ဝေဆည်တို့အဖဖါအဝင် ဒေသအတွင်းရှိ လမ်းထုံးလုပ်စဉ်များ ၊ နည်းနာနိုးဆလေများနှင့်ဖါတိုဆက်၍ နိုင်ငံအတွင်းရှိ ကများ/မ အခြေခြေအကြမ်းဖက်မှုထိမှုဟုတ် ကလေးထူဝယ်ကာကွယ်စောင့်ရှောက်ရေးဆိုင်ရာ တာဝန်ရှိထုတို့နှင့် တိုင်ပင်ပါ။

---> သင်၏ အခြေကို မေးမြန်းလာပါက ရှင်သန်ကျန်ရစ်သူကို မည်သူ့ထံသို့၊ မည်သည့်အချိန်တွင် မည်သည့်အတွက်ကြောင့် သွားမည်ဆိုသည်နှင့် ပတ်သက်၍ ဆုံးဖြတ်ချက်များ ချမှတ်ဖို့ တိုက်တွန်းအားပေးပါ။

---> အခြေအနေနှင့်စပ်လျဉ်း၍ သင်၏ ကိုယ်ပိုင်အခြေကို မပြောပါနှင့်၊

ဝန်ဆောင်မှုများရရှိနေလျှင် ရရှိနိုင်သည့် ဝန်ဆောင်မှုများအကြောင်း တိကျသည့် သတင်းအချက်အလက်များ၊ ပိုမို သက်တောင့်သက်သာရှိနိုင်ဖို့ ဆွေးနွေးစရာ နည်းလမ်းများကို ရှင်သန်ကျန်ရစ်သူကို အသိပေးပါ...

---> ကြိုတင်ပြင်ဆင်ခြင်းသည် အဓိကသော့ချက်ဖြစ်ပါသည်၊ ဝန်ဆောင်မှုသတင်းအချက်အလက်စာရွက် (စာမျက်နှာ ၅ နှင့် ၆) ကို အသုံးပြု၍ သင့်ထံတွင် ရရှိနိုင်သော ဝန်ဆောင်မှုများနှင့် ထို ဝန်ဆောင်မှုများကို ရယူနိုင်မည့် နည်းလမ်းများ ဆိုင်ရာ နောက်ဆုံးရ သတင်းအချက်အလက်များ သင့်ထံတွင်ရှိနေအောင် လုပ်ဆောင်ထားပါ။

---> ဝန်ဆောင်မှုတစ်ခု ရှိ/မရှိ သေချာသေလျှင် သေချာသေကြောင်း ပြောပါ၊

ပြောရဲဆွေးနွေးမှုကို ချိန်းကြောင်းနှစ်ခု အသုံးသတ်ပါ...

---> သတင်းအချက်အလက်များကို လျှို့ဝှက်ထိန်းသိမ်းပါ၊

---> ရှင်သန်ကျန်ရစ်သူ ချမှတ်သည့် မည်သည့် ဆုံးဖြတ်ချက်ကိုမဆို အားပေးပါ၊

---> သင်၏ တာဝန်မှာ ရှင်သန်ကျန်ရစ်သူကို ဆုံးဖြတ်ချက်များ ချမှတ်ရာတွင်၊ ဖွေးချယ်မှုများ ပြုလုပ်ရာတွင် (မည်သည့်ဆုံးဖြတ်ချက်မျှ မချ/ ဖွေးချယ်မှုမျှ မပြုလုပ်လျှင်ပင်) ကူညီပံ့ပိုးပေးရန် ဖြစ်ကြောင်း၊ မဖေ့ပါနှင့်၊ ရှင်သန်ကျန်ရစ်သူနှင့် အကြိမ်ကြိမ် တွေ့ဆုံခြင်း သို့မဟုတ် ဖွေးခန့်ခြင်း၊ နှစ်သိမ့်ဖွေးနွေးဖေးခြင်း သို့မဟုတ် ရှင်သန်ကျန်ရစ်သူ၏ အမှုကိစ္စကို စိစဉ်ပေးခြင်းတို့ မပြုလုပ်ပါနှင့်၊

ဆွေးနွေးပြောဆိုပြီး နောက်ပိုင်း...

ပြန်လည်သုံးသပ်ဆင်ခြင်ခြင်းနှင့် မိမိတာသာစောင့်ရှောက်ခြင်း - သင့်အနေဖြင့် အရာရာကို အမှားအယွင်းမရှိ မှန်ကန်စွာ လုပ်ဆောင်ပေးနိုင်သည်၊ သို့သော် ထိုသူ၏ အတွေ့အကြုံကို ပြန်လည်ကုစားပေးရန် သို့မဟုတ် နာကျင်မှုများ ပျောက်ကွယ်သွားအောင် လုပ်ဆောင်ပေးနိုင်မည် မဟုတ်ကြောင်းကို မဖေ့ဖို့ အဖေရကြီးပါသည်၊ အခြားသူများ၏အတွေ့အကြုံများကို နားထောင်ပေးခြင်းနှင့် ကြားသိရခြင်းကြောင့် သင်သည် ၎င်းတို့၏ နာကျင်၊ ထိခိုက်စရာ သို့မဟုတ် စိတ်ဒဏ်ရာရစေသည့် အတွေ့အကြုံများနှင့် ထိတွေ့ရမည်ဖြစ်သည်၊ ယင်းကို ဆင့်ပွားဒဏ်ရာ (secondary trauma) ဟုလည်း ခေါ်ပါသည်၊ ထိုခံစားချက်များသည် မိမိကိုပါ ထိခိုက်လာလျှင် သင့်ကိုယ်သင် မည်သို့ စောင့်ရှောက်ရမည် ဆိုသည်ကို စဉ်းစားပါ၊ သင်၏ လုပ်ဖော်ကိုင်ဖက်များ၊ အခွဲခဖါင်းဆောင် သို့မဟုတ် GBV ကျွမ်းကျင်ပညာရှင် အပါအဝင် သင့်အခွဲ့ အစည်း၏ အထောက်အကူပြုစနစ် သို့မဟုတ် ကွန်ရက်ကို ဆက်သွယ်၍ အပြန်အလှန်ပြောဆိုခြင်း (ရှင်သန်ကျန်ရစ်သူ၏ အချက်အလက်များကို လျှို့ဝှက်ထိန်းသိမ်းပေးရန် မဖေ့ပါနှင့်) နှင့် အကူအညီ တောင်းခံခြင်းများ ပြုလုပ်ပါ၊

အချို့သော အကြမ်းဖက်မှု အမျိုးအစားများ (ဥပမာ အိမ်တွင်းအကြမ်းဖက်မှု) သည် သံသရာလည်နေတတ်သည့်အတွက် ထိုရှင်သန်ကျန်ရစ်သူကို နောက်တစ်ကြိမ် ထပ်မြန်တွေ့နိုင်ပါသည်၊ သို့မဟုတ် ထိုသူသည် နောက်ထပ်အကြမ်းဖက်မှု တစ်စုံတို့ ထပ်မံခံစားရကြောင်း သိရှိနိုင်ပါသည်၊ ၎င်းတို့ ကြုံတွေ့ရမှုများကို သင် ပြောင်းလဲပေးနိုင်ပါ၊ သို့သော် အောက်ပါတို့ကိုမူ သင်လုပ်ပေးနိုင်ပါသည်

---> အကြမ်းဖက်မှု ဖြစ်ပေါ်သည့် အခါတိုင်းတွင် သင်သည် ရှင်သန်ကျန်ရစ်သူနှင့် ယခင်က စကားပြောဖူးသည် ဖြစ်စေ၊ မပြောဖူးသည်ဖြစ်စေ ၎င်းကို ဝေဖန်ဆုံးဖြတ်သတ်မှတ်မှု အလျဉ်းမရှိဘဲ နားထောင်ပေးနိုင်သည်၊

---> သင် ဆောင်ရွက်ပေးသည့် ဝန်ဆောင်မှုများသည် ဘေးကင်းလုံခြုံမှု ပိုရှိစေရန်၊ GBV အကြမ်းဖက်မှုကို တွေ့ကြုံခံစားရသူများအတွက် ပိုမိုအပြုသဘောဆောင်သော၊ အားပေးကူညီသော ပတ်ဝန်းကျင်မျိုး ဖန်တီးပေးနိုင်ရန်အတွက် သင်၏ အစီအစဉ်ကို ပိုကောင်းအောင် လုပ်နိုင်မည့် နည်းလမ်းများကို စဉ်းစားပေးနိုင်သည်၊

ကလေးတိုင်းကို မျှတစွာ ဆက်ဆံပါ

- ကလေးတိုင်းသည် ယောကျ်ားလေးဖြစ်စေ၊ မိန်းကလေးဖြစ်စေ၊ အသက်အရွယ်၊ မိသားစုအခြေအနေ၊ ၎င်းတို့ကို ပြုစုစောင့်ရှောက်သူ၏ အဓိကအထားအဆင့်အတန်း သို့မဟုတ် အခြားသော ကိုယ်ပိုင်လက္ခဏာများ မည်သို့ပင် ရှိစေဘတ်လိုက်ခြင်းတင်၍ တူညီသော ကူညီပံ့ပိုးမှုများကို ပေးသင့်ပါသည်။ GBV အကြမ်းဖက်မှုခံစားခဲ့ရသည့် ကလေးငယ်တစ်ဦးကို ဂိုကိုးရာခဲ့ဖူးသူကဲ့သို့ ခဲဆက်ဆံပါနှင့်။ ကလေးတိုင်းတွင် တူရွတ်ထူးခြားသည့် စွမ်းရည်များနှင့် အားသာချက်များရှိပြီး ဒဏ်ရာကို ကုစားနိုင်စွမ်းရှိပါသည်။ ရှင်သန်ကျန်ရစ်သူ ကလေးငယ်တစ်ဦးကို ၎င်းနှလည်နိုင်သည့် နည်းလမ်းဖြင့်၊ ၎င်း၏ ဂုဏ်သိက္ခာနှင့် အခြင်ရားကို လေးစားစွာဖြင့် စကားပြောပါ။

လျှို့ဝှက်ထိန်းသိမ်းပေးပါ

- ကလေးငယ်/ဆယ်ကျော်သက်နှင့် ပြောဆိုဆက်ဆံရာတွင် မည်သည်ကိုမျှ ရေးမှတ်ခြင်း၊ တတ်ပုံရိုက်ခြင်း သို့မဟုတ် တနည်းနည်းဖြင့် မှတ်တမ်းတင်ခြင်းများ မပြုလုပ်ပါနှင့်၊ အသံဖမ်းယူနေသည်ဟု ထင်ခြင်းယူဆနိုင်သည့် ဖုန်းများ၊ ကွန်ပျူတာများကို သိမ်းဆည်းထားပါ။ ကလေးငယ်/ဆယ်ကျော်သက်အကြောင်း သို့မဟုတ် ၎င်း၏ အဝတ္ထုအကြိုအကြောင်း သတင်းအချက်အလက်မှန်သမျှကို မျှဝေမည်ဆိုပါက ခွင့်ပြုချက်တောင်းခံပါ။ ဤသည်မှာ ကလေးငယ်/ဆယ်ကျော်သက်မှ ယုံကြည်ရသည်ဟု သတ်မှတ်သူ တစ်ဦးဦးထံ အချက်အလက်များကို မျှဝေပေးနိုင်မလား ဆိုသည်ကို မေးမြန်းပါဟု ဆိုလိုခြင်း ဖြစ်သည်၊

ကလေးငယ်၏ ဒေးကင်း လုံခြုံမှုအတွက် ဆောင်ရွက်ပေးပါ

- ကလေးငယ်၏ ရုပ်ပိုင်းဆိုင်ရာနှင့် စိတ်ပိုင်းဆိုင်ရာ ဒေးကင်းလုံခြုံရေးသည် အဓိက အချက် ဖြစ်ပါသည်၊ သူ/သူနှင့် ပြောဆိုဆက်ဆံနေသော အချိန် တစ်လျှောက်လုံး၊ ရွေ့ဆက်လုပ်ရမည့် လုပ်ငန်းအဆင့်များအားလုံးနှင့် စပ်လျဉ်း၍ ကလေးငယ်၏ ဒေးကင်း လုံခြုံရေးအတွက် ထည့်သွင်းစဉ်းစားပါ။

တစ်ခါတစ်ရံတွင် ကလေးအတွက် အကောင်းဆုံးဖြစ်စေရန်နှင့် သူ/သူမ၏ ရုပ်ပိုင်းဆိုင်ရာ၊ စိတ်ပိုင်းဆိုင်ရာ ကျန်းမာရေးပြဿနာများအတွက် မည်သို့ ကူညီပံ့ပိုးပေးရမည် ဆိုသည်ကို ရှင်းရှင်းလင်းလင်း မသိရှိခြင်းများလည်း ရှိနိုင်ပါသည်၊ အကယ်၍ ကြုံတွေ့နေရသည့် အခြေအနေသည် သေးကင်းလုံခြုံမှုရှိ/မရှိ သေချာမသေလျှင် သင့်အဝန်းဖြင့် သူ/သူမ၏ သေးကင်းလုံခြုံရေးအတွက် ဆောင်ရွက်ပေးနိုင်မည့် နည်းလမ်းများကို ပိုမိုနားလည်သိကျွမ်းသည့် အခြား ဝန်ဆောင်မှုပေးသူ သို့မဟုတ် အဖွဲ့ဝင်တစ်ဦးနှင့် လျှို့ဝှက်ထိန်းသိမ်းမှုရှိစွာ တိုင်ပင်ဆွေးနွေးရန် လိုအပ်ကြောင်း ကလေးငယ်ကို အသိပေးပါ။

ကလေးငယ်/ဆယ်ကျော်သက်တစ်ဦး သို့မဟုတ် ၎င်းကို ပြုစုစောင့်ရှောက်သူတစ်ဦး၏ ကူညီပံ့ပိုးမှုကို တောင်းခံ ရယူသည့် နည်းလမ်းများကို သိရှိအောင် လုပ်ထားပါ

- ကလေးများနှင့် ဆယ်ကျော်သက်များ၏ အကူအညီတောင်းခံသည့် နည်းလမ်းများသည် လူကြီးများနှင့် ကွဲပြားပြီး တိုက်ရိုက်ဖွင့်ဟပြောပြခြင်းများကို အလွန်ပင်ပြုခဲပါသည်၊ ကလေးများအနေဖြင့် လူကြီးများကို ယုံကြည်စိတ်ချပြီး စကားပြောရိုက်ခဲပါသည်၊ အထူးသဖြင့် ၎င်းတို့ ကောင်းစွာမသိသော လူကြီးများ ဖြစ်နေလျှင်၊ ကြောက်ရွံ့မှု၊ အရှက်ရမှု သို့မဟုတ် ရှက်ရွံမှုတို့ကို ခံစားနေရလျှင်၊ သို့မဟုတ် ၎င်းတို့၏ စိတ်ခံစားချက်များကို ဖော်ပြရမည်ကို ကြောက်ရွံ့နေလျှင် ပိုဆိုးပါသည်၊ သင့်အနေဖြင့် (၁) ကလေးသူငယ် မတော်မတရားပြုကျင့်ခံရကြောင်း ကောလာဟလများ ကြားသိထားခြင်း၊ (၂) လူကြီးများက ကလေးတစ်ဦးအတွက် အကူအညီရယူရန် သင့်ထံ ချဉ်းကပ်ခြင်း၊ သို့မဟုတ် (၃) ကလေး၏ လက္ခဏာများ သို့မဟုတ် အပြုအမူများကို အခြေခံ၍ ကလေးသူငယ် အနီး အထက် ပြုမူတစ်ခုခု ခံနေရသည်ဟု သံသယဝင်ခြင်း စသည့် နည်းလမ်းများဖြင့် သိရှိနိုင်ပါသည်၊

ေဆာ်လွှဲ ေရွးခ်ယ်ခွဲ

တစ်ခုံတစ်ဦးက အတူအညီလိုအပ်နေသော ကလေးငယ်/ဆယ်ကျော်သက်တစ်ဦးအတွက် သင့်ထံမှ အတူအညီ တောင်းခံ လာပါက ...

- သင့်ထံမှ အကူအညီတောင်းခံသူအား ရရှိနိုင်သည့် ဝန်ဆောင်မှုများအကြောင်း တိကျသည့် နောက်ဆုံး သတင်းအချက်အလက်များကို ပေးပါ၊
- လျှို့ဝှက်ထိန်းသိမ်းမှုကို လိုက်နာစောင့်ထိန်းပါ၊
- ကောလာဟလတစ်ခုကို ခုံစစ်စစ်ဆေးခြင်း သို့မဟုတ် ကလေးငယ်/ဆယ်ကျော်သက်ကို ရှာဖွေ/အင်တာဗျူးရန် ကြိုးစားခြင်း မပြုပါနှင့်၊
- သင် သိရှိထားသည့် အချက်အလက် အသေးစိတ်ကို မည်သူနှင့်မျှ ဖွေးနွေးခြင်း သို့မဟုတ် မျှဝေခြင်း မပြုပါနှင့်၊

ကလေးငယ်/ဆယ်ကျော်သက်ကိုယ်တိုင် သင့်ထံမှ အတူအညီတောင်းခံလာပါက ....

ကြည့်ရှုပါ

- ကလေးငယ်/ဆယ်ကျော်သက်ကို စကားပြောရန် အတွက် ဆီတိုပြီမ်မှုရှိသည့် သီးသန့်နေရာတစ်နေရာ ရှာလိုပါသလားဟု ဖေးပါ၊ အခြားသူများက သင်တို့ကို ခြင်နိုင်ထောလည်း မကြားနိုင်သည့် နေရာတစ်ခု ဖြစ်ဖို့ သတိပြုပါ၊
- သင်သည် မျက်လုံးချင်းတစ်တန်းတည်းဖြစ်သည့် အနေအထားဖြင့် ထိုင်ရန် သတိပြုပါ၊ လမ်းဖွင့်ပေးသော ကိုယ်ဟန်အမူအရာဖြင့် နေပါ၊
- စကားပြောရာတွင် မိန်းကလေးက အရွယ်ရောက်ပြီးသော အမျိုးသမီးနှင့်၊ ယောကျ်ားလေးက အရွယ်ရောက်ပြီးသော အမျိုးသားနှင့် ပြောလိုပြခြင်း ရှိ/မရှိ ၎င်းတို့ကို ဖေးပါ၊
- ကလေးငယ်/ဆယ်ကျော်သက်ကို ပို၍ ဆီတိုပြီမ်သော သို့မဟုတ် သီးသီးသန့်သန့် ပိုရှိသော နေရာ သို့ သွားရန် ညွှန်ကြားခြင်း မပြုပါနှင့်၊ သို့မဟုတ် ကလေးကို ၎င်း၏ ဆန္ဒမပါဘဲ သီးခြားခွဲထားခြင်း မပြုပါနှင့်၊
- ထိကိုင်ခြင်း၊ ဖွေ့ဖက်ခြင်း သို့မဟုတ် အခြား ခန္ဓာကိုယ်ရုပ်၊ ထိတွေ့မှုများကို မပြုလုပ်ပါနှင့်၊ ထိုသို့ပြုလုပ်ခြင်းသည် စိတ်ဒဏ်ရာရခြင်း၊ သက်တောင့်သက်သာ မရှိခြင်းနှင့် စိတ်ပင်ပန်းဆင်းရဲခြင်းတို့ကို ဖြစ်စေနိုင်ပါသည်၊

နားထောင်ပါ

- အာရုံစူးစိုက်ကာ နားထောင်ပေးပါ၊ နှုတ်ခြင့် ထုတ်မပြောသော်လည်း အခြားကိုယ်ဟန်အမူအရာများဖြင့် ဆက်သွယ်ပြောဆိုမှုများကိုလည်း သတိထားပါ၊
- တည်တည်ငြိမ်ငြိမ် ရှိပါ၊ စိတ်ရှည်ပါ၊ ပြောသမျှကို မည်သည့် ဝေဖန်သတ်မှတ်ချက်များ ဖေးဘဲ လက်ခံနာ၊ ထောင်ပေးပါ၊
- ကလေးငယ်/ဆယ်ကျော်သက်ကို ၎င်းတို့၏ ခံစားချက်များအား၊ ၎င်းတို့၏ ကိုယ်ပိုင်စကားလုံးများဖြင့် ဖော်ပြပြောဆိုခွင့်ပြုပါ၊ အင်တာဗျူးခြင်း သို့မဟုတ် စစ်ဆေးခြင်း မပြုလုပ်ပါနှင့်၊ မည်သည့်ကိုမျှ ချမဖေးပါနှင့်၊ တတ်ပုံအရိုက်ခံပါနှင့်၊ သို့မဟုတ် ကလေးငယ်/ဆယ်ကျော်သက် အကြောင်း၊ သို့မဟုတ် ၎င်းတို့၏ အဝတ္ထုအကြိုအကြောင်း သတင်းအချက်အလက်များကို မည်သူ့ထံမျှ နှုတ်ခြင့် ဖြေပြောပြခြင်း မပြုပါနှင့်၊
- ထိတ်လန့်မှု၊ ဓယုံကြည်မှု၊ ဒေါသ သို့မဟုတ် ကလေးငယ်/ဆယ်ကျော်သက်ကို စိတ်ပင်ပန်းဆင်းရဲစေမည့် အခြားမည်သည့် တုံ့ပြန်မှုမျိုးကိုမျှ မပြသပါနှင့်၊
- ကြိုးကြိုးကျယ်ကျယ် စကားလုံးများ သုံးစွဲခြင်း သို့မဟုတ် ကလေးငယ်/ဆယ်ကျော်သက် လိုက်ဓမိနိုင်စေသော စကားများ ပြောခြင်း မပြုလုပ်ပါနှင့်၊

နှစ်သိမ့်အားပေးပါ

- ကလေးငယ်/ဆယ်ကျော်သက်အား အဖြစ်အပျက်များကို မိမိအားဖြာပြရာတွင် စိတ်ပူမှု မရှိစေရန် အားပေးပါ။
- ကလေးငယ်၏ အမြင်၊ ယုံကြည်ချက်များနှင့် အတွေးများကို လေးစားပါ။
- ယဉ်ကျေးမှုနှင့် ကိုက်ညီသင့်တော်သည့် အားပေး နှစ်သိမ့်သော စကားများကို ပြောဆိုပါ။ ဥပမာ– "သား/သမီးကို ယုံပါတယ်"
- ယုံကြည်မှုတည်ဆောက်ခြင်း "သား/သမီး ခုလို ပြောပြတာ ဝမ်းသာပါတယ်"
- ကလေးငယ်နှင့် ဆက်ဆံရေးတည်ဆောက်ခြင်း။ "သား/သမီးရဲ့ အတွေ့အကြုံကိုပြောပြလို့ ကျေးဇူးတင်ပါတယ်"
- စာနာမှုကို ဖော်ပြခြင်း။ "ခုလို ပြောပြတာ သား/သမီးက သိပ်ကို သတ္တိရှိတဲ့ ကလေးပို့ပါ"
- အားပေးနှစ်သိမ့်ခြင်းနှင့် လုပ်နိုင်စွမ်းရှိသည်ဟု ခံစားသိရှိစေခြင်း
- မိမိ ဓတည်နိုင်သည့် ကတိများကို ပေးပါနှင့်၊ ဥပမာ ကလေးငယ်၏ အဆင်ပြေ ကျန်းမာပျော်ရွှင်မှုအတွက် ဆောင်ရွက်ပေးရမည့် အရာများသည် မိမိ၏ စိုးထိန်းချုပ်မှုအတွင်းတွင် မရှိကဲ့နှင့် "အားလုံးအဆင်ပြေသွားမှာပါ" ဟု ပြောဆိုခြင်း။
- ကလေးငယ်/ဆယ်ကျော်သက်ကို သူ/သူမ ဆန္ဒမရှိလျှင် မိမိနှင့် ဆက်စကားဖြောဖို့ မိအား ပေးပါနှင့်၊

ချိတ်ဆက်ပေးပါ

- ကလေးငယ်/ဆယ်ကျော်သက် ယုံကြည်အားကိုးသည့်သူ တစ်ဦးဦး ရှိ/မရှိ မေးပါ။ ထိုသူကို ဆက်သွယ်ပေးစေလိုခြင်း သို့မဟုတ် ထိုသူကို သွားရှာရာတွင် အဖော်လိုက်ပေးစေလိုခြင်း ရှိ/မရှိ မေးပါ။
- ကလေးငယ်/ဆယ်ကျော်သက်သည် ဘေးကင်းလုံခြုံပြီဟု ခံစားရသည်အထိ သို့မဟုတ် သူ/သူမက အန္တရာယ်ကင်းရှင်း ယုံကြည်ရသည်ဟု သတ်မှတ်သူတစ်ဦး၏ စောင့်ရှောက်မှုကို ရရှိသည်အထိ သူ/သူမနှင့် အတူ နေပေးပါ။
- ကလေးငယ်/ဆယ်ကျော်သက်နှင့် သူ/သူမ ယုံကြည်အားကိုးဖော လူကြီးကို ရရှိနိုင်ဖော ဝန်ဆောင်မှုများနှင့် ထိုဝန်ဆောင်မှုများကို ရယူနိုင်သည့် နည်းလမ်းများအကြောင်း တိကျ၍ အသုံးဝင်သော သတင်းအချက်အလက်များကို ပေးပါ။
- သင် ဘာကို သိရှိသည်၊ ဘာကို မသိရှိ ဟုသည်ကို ပြောပြပါ။ ဖောင်းဆဲသည့် သတင်းအချက်အလက် သင့်ထံတွင်မရှိပါက "ကျွန်တော်/ကျွန်မ မသိပါဘူး" သို့မဟုတ် "ကျွန်တော်/ကျွန်မဆီမှာ အဲဒီသတင်းအချက်အလက် မရှိပါဘူး" တု ပြောပါ။

ကလေးများ၏ အသက်နှင့် ဆုံးဖြတ်ချက်များ ချမှတ်နိုင်စွမ်းဆိုင်ရာ ရည်ညွှန်းကိုးကားချက်များ

ကလေးငယ် သို့မဟုတ် ဆယ်ကျော်သက်တစ်ဦး၏ ၎င်းတို့ကိုယ်တိုင်နှင့် ၎င်းတို့၏ သက်ဆိုင်ရာ ပြုစုစောင့်ရှောက်သူ(များ) ပေါင်းစပ်ညှိနှိုင်း၍ ဆုံးဖြတ်ချက်များ ချမှတ်နိုင်စွမ်း ရှိ/မရှိ ဆုံးဖြတ်ပေးနိုင်ရန် အကောင်းဆုံး အခန်အထားတွင် ရှိသူမှာ GBV အကြမ်းဖက်မှု ခံစားခဲ့ရသည့် ကလေးများ/ ဆယ်ကျော်သက်များနှင့် အလုပ်လုပ်ဖူးသည့် အတွေ့အကြုံရှိသော အထူးပြုကျွမ်းကျင်သူတစ်ဦးသာ ဖြစ်ကြောင်း သတိပြုပါ။

အထူးပြုကျွမ်းကျင်သူတစ်ဦးဟုတ်သည် သင်၏တာဝန်မှာ ကလေးငယ်/ဆယ်ကျော်သက် ပြောသည်ကို နားထောင်ပေးရန်၊ အားပေးနှစ်သိမ့်ရန်၊ ၎င်းတို့ ယုံကြည်အားကိုး သူ တစ်ဦးဦးနှင့် ဆက်သွယ်ပေးရန်၊ ရရှိနိုင်သည့် ဝန်ဆောင်မှုများအကြောင်း သတင်းအချက်အလက်များကို မျှဝေပေးရန်သာ ဖြစ်ပါသည်၊ အောက်ဖော်ပြပါ အသက်အုပ်စု အမျိုးအစားများသည် ရည်ညွှန်းကိုးကားရန်အတွက် သာဖြစ်ပြီး အသက်အရွယ်၊ ရင့်ကျက်မှု အတိုင်းအတာ၊ ဖွံ့ဖြိုးမှုအဆင့်နှင့် အခြားအကြောင်းအချက်များပေါ် မူတည်ကာ ပြောင်းလဲသွားနိုင်ပါသည်။

အသက် ၀၅ နှစ်နှင့်အထက် ရှိသော ဆယ်ကျော်သက်များသည် ယေဘုယျအားဖြင့် ၎င်းတို့ကိုယ်တိုင် ဆုံးဖြတ်ချက်များ ချမှတ်နိုင်လောက်အောင်၊ ၎င်းတို့ ကြုံတွေ့ခဲ့ရသည်များကို နားလည်နိုင်လောက်အောင် ရင့်ကျက်နေပြီဖြစ်ပါသည်၊

သင်၏ အခန်းကဏ္ဍ

(၁) ဆယ်ကျော်သက်မှ ၎င်း၏ အတွေ့အကြုံကို ပြောပြပြင်းကို နားထောင်ပေးရန်၊

(၂) ကူညီပံ့ပိုးမှုများ၊ ဆက်လက်ရရှိသွားရန် အတွက် ၎င်း ယုံကြည်စိတ်ချသည့်သူ တစ်ဦးဦးနှင့် ဆက်သွယ်နိုင်အောင် ကူညီပေးရန်၊

(၃) ရရှိနိုင်သော ဝန်ဆောင်မှုများနှင့် ထိုဝန်ဆောင်မှုများကို ရယူနိုင်မည့် နည်းလမ်းများ အကြောင်း သတင်းအချက်အလက်များကို ပေးရန်၊

အသက် ၆ နှစ်မှ ၉ နှစ်ကြား၊ ကလေးငယ်များနှင့် အသက် ၁၀ နှစ်မှ ၁၄ နှစ်ကြား၊ ဆယ်ကျော်သက်များသည် အကြမ်းဖက်ခံရမှု အတွေ့အကြုံများကို ၎င်းတို့ဘာသာ ပြောပြနိုင်စွမ်းရှိနိုင်သည် သို့ဟုတ် ရှိချင်မှရှိနိုင်မည် ဖြစ်သည်၊ ဆုံးဖြတ်ချက်များကိုလည်း ၎င်းတို့ကိုယ်တိုင် ချမှတ်နိုင်စွမ်း ရှိနိုင်သည် သို့မဟုတ် ရှိကောင်းမှ ရှိမည်ဖြစ်သည်၊

သင်၏ အခန်းကဏ္ဍ

(၁) ကလေးငယ်/ဆယ်ကျော်သက် ရွေးဆက်လုပ်ရမည့် ကိစ္စများအတွက် ၎င်းကို ကူညီပံ့ပိုးပေးရန်၊ ၎င်း ယုံကြည်စိတ်ချသည့် လူကြီးတစ်ဦးအား ရှာဖွေနိုင်အောင် ကူညီပေးရန်၊ (၂) ကလေးငယ်/ဆယ်ကျော်သက်နှင့် ၎င်းအရွယ်သည့် လူကြီး နှစ်ဦးစလုံးကို ရရှိနိုင်သော ဝန်ဆောင်မှုများနှင့် ထိုဝန်ဆောင်မှုများကို ရယူနိုင်မည့် နည်းလမ်းများ အကြောင်း သတင်းအချက်အလက်များကို ပေးရန်၊

မွေးစဉ မှ နှစ်ကြား တစ်နှစ်အောက် ကလေးများနှင့် လမ်းလျှောက်တတ်ခါစ ကလေးများသည် ဆက်သွယ်ပြောဆိုနိုင်မှု ဝွမ်းရည် နည်းပါးသည့် အတွက် အကြမ်းဖက်ခံရမှု အတွေ့အကြုံများကို ၎င်းတို့ဘာသာ ပြောပြနိုင်စွမ်း မရှိပါ၊ မိတ်ဆွေ၊ ပြုစုစောင့်ရှောက်သူ၊ မိသားစုဝင်၊ ရပ်ရွာထဲမှ လူတစ်ဦး။ စသည့် အခြားသူတစ်ဦးက ကလေး၏ ကိုယ်စား အကူအညီတောင်းခံလာနိုင်ခြေ ရှိပါသည်၊

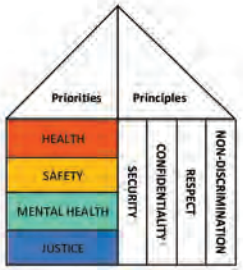
သင်၏ အခန်းကဏ္ဍ

အဖော်ပါလာသူကို ရရှိနိုင်သော ဝန်ဆောင်မှုများနှင့် ထိုဝန်ဆောင်မှုများကို ရယူနိုင်မည့် နည်းလမ်းများအကြောင်း သတင်းအချက်အလက်များကို ပေးရန်၊

UNHCR ၏ ရှင်သန်ကျန်ရစ်သူအတွက် အကောင်းဆုံးဖြစ်စေရန် ရည်မှန်းဆုံးဖြတ်ခြင်း လမ်းညွှန်ချက်များ (Best Interest Determination Guidelines)၊ ၂၀၀၈၊ IRC/UNICEF - လိင်မှုဆိုင်ရာ မတော်မတရား၊ ပြုကျင့်ခံရသော ရှင်သန်ကျန်ရစ်သူ ကလေးသူငယ်ကို ပြုစုစောင့်ရှောက်ခြင်း (Caring for Child Survivors of Sexual Abuse)၊ ၂၀၀၂ တို့မှ ဆီလျော်သလို ပြင်ဆင်တင်ပြပါသည်၊

Appendix 5. GBV pocket guide. This resource is taken from: www.gbvguidelines.org

Appendix 6. Gender Based Violence (GBV) guideline for SMRU cases, version 6_5, 03 January 2020



Remember: NON-DISCRIMINATION, RESPECT, CONFIDENTIALITY, SAFETY

Survivor arrives clinic

Any SMRU staff (HW, IT, nurse, etc) **Remember your role and responsibilities**

Diagnosis not clear (ie. 'vaginal bleeding')

Medic, Midwife, Nurse or Doctor

As soon as you suspect GBV, be sensitive to the patient, finish your history or examination. Eg. do not stop suddenly and leave the exam room. Finish listening to complaints or finish exam if already started.

Emergency

Emergency case (very sick)
OR
High risk case
- <72 hr from event
- < 18 years old
- Very old
- Developmental delay

Refer all cases to MSGH / MWDH
(GBVCG should meet at hospital)

Diagnosis clear (ie. 'rape')

Stable condition
Diagnosis clear
(ie. 'trauma abuse')

Call SMRU site GBV team
Ask consent from victim or family for help

If a survivor or family refuses help, provide them with contact information for local GBV groups. If the victim is a child or is developmentally delayed, you must send to the hospital even if the family does not

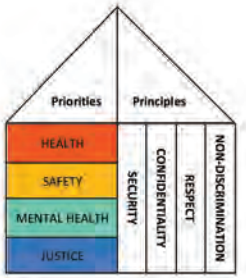
HEALTH
IF **RAPE <72 hr**, call Medic for urgent treatment or referral **follow SMRU Medical Guidelines** (p. XX).
For any medical problem, send to medic.

SAFETY RISK
Offer immediate referral to safe house. If not possible, make a safety plan at SMRU (contact site admin, logistics, etc)

CASE MANAGEMENT/ MENTAL HEALTH
Contact GBVCG or specific organisation

JUSTICE/LEGAL
Ask if they want to report. Remember timeline (<3 months is best). Contact GBVCG or specific organization for support.

NOTE:
Anyone can call directly to the GBVCG contact or another NGO. You do not need to register or see SMRU staff first (ie. you are a victim and you contact directly to GBVCG to keep your problem confidential, or patient refuse to see medic or SMRU GBV team).



PRINCIPLES OF GBV MANAGEMENT FOR NON-GBV SPECIALIST

Survivors have the right to self-respect (dignity). This right was taken away by the attacker. We must understand that it is not the survivor's fault and the attacker is wrong. Do not judge the survivor or make them think it is their fault.

1. **NON-DISCRIMINATION** – everyone has the right to have treatment and management. You CANNOT choose the survivors that you want or do not want to treat. You must treat all with the same respect and dignity.
2. **RESPECT** – Respect the survivor's choices. Do not judge them or tell them what to do. Do not ask "What happened?". This should be done by a trained counselor on the SMRU Site GBV team.
3. **CONFIDENTIALITY AND CONSENT** – Must have written consent from survivor to share information. Think before you talk when you discuss the case. If you have sadness or stress because of the case, please debrief (share your feelings) with the staff involved in the case and the SMRU Site GBV team.
4. **SECURITY/SAFETY** – The survivor and any other persons at risk (e.g. children) must be removed from harm.

CLINICAL ROLE AND RESPONSIBILITIES

ROLE: Apply principles of GBV management, diagnose, treat and manage medical issues

RESPONSIBILITIES:

1. Basic counseling: listen, be kind
2. Diagnosis – Sometimes it is not obvious, so need to *think about GBV on differential diagnosis*
3. Give STI/PEP treatment if rape <72 hr
4. Give pregnancy prevention if rape <120 hr
5. Do NOT ask history about event (GBV teams will do)
6. Do NOT wash/shower/change clothes
7. Do NOT examine trauma area. Better to refer to GBV specialist. If you do a general exam, must document normal and abnl findings (can take photo, except face, as evidence)
8. Keep as confidential as possible. Discuss referrals with site GBV team – how/what to keep confidential
9. Get consent to share information with site GBV team Communicate plan (eg. "Will you allow me to share your situation with site GBV team? They can help you. Please wait, I will go now to find them.")

SITE GBV TEAM ROLE AND RESPONSIBILTIES

ROLE: Give psychosocial support for the patient. Case referral and management.

RESPONSIBILITIES:

1. Available to support clinical staff for GBV survivor referral (24hr every day)
2. Use counseling skills: listen, be kind, watch body language, address survivor's feelings
3. Get written consent from survivor before referral outside SMRU
4. Know what information needed for referral to GBVCG or hospital – demographics, family address, basic diagnosis/kind of case, needs of the victim.
5. Have basic skills to interview and counsel GBV survivors – if the NGO cannot take a case urgently.
6. Assess when a physical examination is needed by SMRU or GBV specialist outside SMRU.
7. Able to explain referral options to the patient
8. Know and update the GBVCG (GBV Coordination Group) contact information at clinic site
9. Communicate plan
10. Organise follow up at SMRU if GBV organization not involved
11. Have regular case review - manage cases, close cases, re-open case, etc.

ALL STAFF ROLE AND RESPONSIBILITIES

ROLE: Apply principles of GBV management. Understand needs of the GBV survivor. Coordinate with team, especially site GBV team. Keep confidentiality. Offer referral.

RESPONSIBILITIES:

<u>Health</u>

1. Assess for any immediate life-threatening injuries
2. Assess for high risk cases that need immediate referral

<u>Safety</u>

1. Assess risk for another attack or suicide.
2. Are there other children at home?
3. If risk for harm, need to manage survivor correctly (eg. safe house)
4. Think about staff safety if survivor admitted to SMRU

<u>Psychosocial</u>

1. Listen. Do not try to solve the problem. Offer information. Let survivor decide.
2. Assess if survivor +family needs money, food, clothes, or transportation

<u>Legal/Justice</u>

1. Encourage survivor to report event
2. Refer to NGO to help with justice issues

APPENDICES

Appendix 7. Surveillance and outbreak

A health surveillance system is in place in collaboration with the Tak Public Health Office (Tak PHO). Any reports of diseases on the list below should be discussed with the site administrator because reporting is done locally. The management of new disease outbreaks and are first discussed with the central SMRU administration, clinical and laboratory teams. After a clear plan is made then the reporting will be coordinated with the site teams.

OBJECTIVES of this system are:

1. To monitor disease trends along the border.
2. To detect disease outbreaks along the border.
3. To institute timely prevention and control measures of diseases along the border.

DISEASES UNDER SURVEILLANCE

- Acute diarrhoea
- Dysentery
- Cholera
- Typhoid fever
- Tuberculosis
- Measles
- Diphtheria
- Pertussis
- AFP / suspected Poliomyelitis
- Dengue
- Malaria
- Filariasis
- Scrub typhus
- Meningitis
- Encephalitis
- Leptospirosis
- STI
- Others: Abnormal or severe cases, deaths of unknown infectious origin

The system is PASSIVE SURVEILLANCE from which health service centres notify regularly to the district health office. The notification has been classified into 3 categories as follows:

1. Routine: A monthly report form is sent to the district health offices. Diseases under routine surveillance by the Bureau of Epidemiology and CCSDPT are indicated with:

   SURVEILLANCE
   See Appendix 7

2. Urgent: The following diseases must be reported within 24 hours due to the need of rapid investigation: Malaria, Cholera, Measles, Diphtheria, Acute Flaccid Paralysis (poliomyelitis), Meningococcal meningitis, abnormal or severe cases, deaths of unknown origin, or where the suspected cause of death is infectious disease. Diseases which must be reported within 24 hours are indicated with:

   URGENT REPORT
   SEE Appendix 7

3. Outbreak: For a suspected disease cluster or an outbreak (e.g. Measles, Dengue, Chikungunya, SARS-CoV-2 or COVID-19), notify the district health officer immediately to allow early investigation.

OUTBREAK DATA FORM

In case of an outbreak of one of the diseases mentioned above both MoPH and the CCSDPT HIS Programme need to be contacted within 24 hours.

DATA COLLECTION INSTRUCTIONS

Once the notifiable disease has been detected, complete the outbreak data form. There may be a specific form (e.g. measles). If there is not a specific form, then collect as much pertinent information as possible (demographics, mobile number, clinical information). This should be shared with the site administrator and reported to the district health office.

CASE DEFINITIONS FOR SURVEILLANCE:

1. Acute Diarrhoea: Patient passing three or more loose or watery stools within 24 hours with or without dehydration.

2. Dysentery: Patient with Diarrhoea with visible blood in the stools OR laboratory confirmed cases of dysentery caused by Shigella dysentery type 1.

3. Cholera: Patient over 5 years old with severe dehydration from acute watery diarrhoea and Vibrio cholerae 01 or 0139 isolated (the case definition can be extended to patients over 2 years old without laboratory confirmation in the case of an outbreak).

4. Typhoid Fever:
   - Suspected Typhoid Fever: Patient who presents with fever ≥ 38.5°C (axillary) for more than 7 days, and negative malaria slide and no other identified cause of fever and at least one of the following: abdominal pain and/or diarrhoea and/or constipation and/or relative bradycardia.
   - Confirmed case: Patient who has blood culture positive for Salmonella typhi

5. Tuberculosis: Newly diagnosed patient who is in one of these categories (based on WHO diagnostic criteria):
   - Pulmonary Tuberculosis, sputum smear positive: patient with at least two initial sputum smear examinations (direct smear microscopy) positive for Acid-Fast Bacilli (AFB), or Patient with one sputum examination positive for

acid-fast bacilli and radiographic abnormalities consistent with active pulmonary tuberculosis as determined by the treating medical officer, or Patient with one sputum specimen positive for acid-fast bacilli and at least one sputum that is culture positive for acid-fast bacilli.

- Pulmonary Tuberculosis, sputum smear negative: Patient with symptoms suggestive of tuberculosis and having one of the following: Three sputum specimens negative for acid-fast bacilli, Radiographic abnormalities consistent with pulmonary tuberculosis and a lack of clinical response to one week of a broad-spectrum antibiotic, Decision by a physician to treat with a full curative course of anti-tuberculosis chemotherapy
- Extra pulmonary tuberculosis: Tuberculosis of organs other than lungs: pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, tuberculous meningitis, etc. Diagnosis should be based on one culture positive specimen from an extra pulmonary site, or histological or strong clinical evidence consistent with active extra-pulmonary tuberculosis, follow by medical officer decision to treat with a full course of anti-tuberculosis therapy. Any patient diagnosed with both pulmonary and extra-pulmonary tuberculosis should be classified as a case of pulmonary tuberculosis

6. Measles: Patient with a 3-day history of fever greater than or equal to 38.5°C AND maculopapular (non-vesicular) rash AND at least one of the following: coryza OR cough OR conjunctivitis.

7. Diphtheria: An upper respiratory tract illness characterised by sore throat, low grade fever, and an adherent membrane of the tonsil(s), pharynx, and/or nose. Or a patient with laboratory confirmation of Corynebacterium diphtheriae from a clinical specimen.

8. Pertussis: Patient presenting with cough for at least 2 weeks and paroxysms of coughing and/or whooping and/or post tussive vomiting.

9. Acute Flaccid Paralysis: Patient presenting with acute flaccid paralysis, including Guillain-Barre Syndrome among children aged less than 15 years and all cases of suspected poliomyelitis among persons of any age.

10. Dengue Infection: Patient with lab confirmed Dengue fever or in an epidemic the case definition can be extended to a patient with fever less than 7 days and malaria slide neg. with at least 2 of the following: headache, pain behind the eyes, myalgia & arthralgia (severe body pain), haemorrhagic signs (including pos. tourniquet test).

11. Chikungunya: Patient with confirmed infection on a laboratory test. The case definition for SMRU is any patient with at least 2 of the following: high fever, joint pain, rash.

12. Malaria: Patient with a positive malaria slide (PF, PV, PM or mixed) or rapid diagnostic test (RDT).

13. Filariasis: Person with positive either Wuchereria Bancrofti or Brugia Malayi by laboratory test.

14. Scrub Typhus: Patient with sudden onset of fever (within 48 hours), negative malaria slide, and a 24 hour-response to doxycycline and eschar and at least two of the following: Rash and/or generalised enlargement of lymph nodes and/or extreme headache and/or acute confusion.

15. Meningitis: Patient who presents with sudden onset of fever > 38°C (axillary), negative malaria slide and at least one of the following: meningeal syndrome (headache, neck stiffness) or positive Kernig' s sign or bulging fontanel in an infant or with cloudy CSF. Meningococcal meningitis: Patient with sudden onset of fever, and petechial or purpural rash and at least one of the following: neck stiffness, altered consciousness, other meningeal sign or laboratory confirmed.

16. Encephalitis: Patient with fever and negative malaria slide and altered consciousness, with headache or convulsion.

17. Leptospirosis: Patient with acute fever and at least one of the following: jaundice and/or headache and/or dark colour urine and/or conjunctival suffusion or calf pain AND positive laboratory testing or in an epidemic.

18. STD: one of:
    - Urethral discharge
    - Abnormal Vaginal discharge excluding Candidiasis
    - Genital ulcer
    - Pelvic inflammatory disease (PID): symptoms of lower abdominal pain and pain during sexual intercourse with an examination showing vaginal discharge, lower abdominal tenderness on palpation, and /or temperature > 38°C.

These can be used if you do not have the ORS powder available.

ORS

HOW TO MAKE ORAL REHYDRATION SOLUTION

Use one ORS powder sachet and mix it with clean boiled water that has been cooled.
Read the directions on the sachet to see how much water to add.

Dilute ORS

HOW TO MAKE DILUTE ORAL REHYDRATION SOLUTION

1 packet (size for 750cc water) of ORS powder + **1500** cc clean water
+ 30g sugar + 1.5g potassium

OR

1 packet (size for 1000cc water) of ORS powder + **2000** cc clean water
+ 40g sugar + 2.5g potassium

Sugar Salt Solution

HOW TO MAKE A SUGAR SALT SOLUTION FOR ORAL REHYDRATION

Take 1 litre of boiled water that has been cooled,
add half of a teaspoon of salt and 8 teaspoons of sugar

A teaspoon is a 5 ml spoon. If you do not have spoons or 1 litre containers available, then the 'pinch and scoop' method can also be used:

Take one cup of water (240 ml)
add a small pinch of salt using 3 fingers.
Before you add the sugar, taste the drink to make sure it's no saltier than tears. Too much salt can be harmful.
If then the drink tastes right, then add a small hand palm scoop of sugar.

Boiled Rice Water

HOW TO MAKE A RICE BASED DRINK FOR ORAL REHYDRATION

Note: AsiaMIX can be used instead of rice paste if the child is NOT severely malnourished.

1 Take one handful (20 to 25 grams) of rice grain.
Wash and soak the rice in water until it is soft.

2 Grind the soaked rice with a pestle and mortar (or any other grinder)
until it becomes a paste.

3 Put two and a quarter glasses of water (about 600ml) into a cooking pot
and mix in the rice paste.

4 Stir well, and heat the mixture until it begins to bubble and boil.
Then take the pan off the fire, and leave the solution to cool.

5 Add a pinch of salt using 3 fingers (up to the first finger joints) (1.5 grams) to the mixture, and stir well. The solution is now ready to be given to the person with diarrhoea.

Storage: this solution should be covered and kept in a cool clean place.
It should be used not more than six to eight hours after preparation.
After this time, throw away any leftover solution.

Appendix 9. IVF table

Intravenous fluid requirements SMRU IPD

Weight kg	NORMAL FLUID REQUIREMENTS (maintenance) ml/hr	drops/min Adult	drops/min Metroset	ml/24 hr	IF Resp Rate > normal OR IF TEMP > 38,5 °c ml/hr	drops/min Adult	drops/min Metroset	ml/24 hr	IF Resp Rate > normal AND TEMP > 38,5 °c ml/hr	drops/min Adult	drops/min Metroset	ml/24 hr
4	16		16	384	19		19	456	23		23	552
5	20		20	480	24		24	576	28		28	672
6	24		24	576	29		29	696	36		36	864
7	28		28	672	34		34	816	40		40	960
8	32		32	768	38		38	912	46		46	1104
9	35		35	840	42		42	1008	52		52	1248
10-11	40		40	960	48		48	1152	58		58	1392
12-13	45		45	1080	54		54	1296	64		64	1536
14-15	50		50	1200	60		60	1440	72		72	1728
16-17	55		55	1320	66		66	1584	78		78	1872
18-19	60		60	1440	72		72	1728	86		86	2064
20-24	65		65	1560	78		78	1872	92		92	2208
25-29	65		65	1560	78		78	1872	92		92	2208
30-34	70	23		1680	84	28		2016	100	33		2400
35-39	75	25		1800	90	30		2160	106	35		2544
40-44	80	27		1920	96	32		2304	114	38		2736
45-49	85	28		2040	102	34		2448	120	40		2880
50-59	90	30		2160	108	36		2592	128	43		3072
60-69	95	32		2280	114	38		2736	136	45		3264
70-79	100	33		2400	120	40		2880	144	48		3456

	NORMAL RR
Infant < 2 months	30-60
Infant 2 months - 1 year	30-50
Toddler (1-4 year)	24-40
Child (5-12 year)	18-30
Adult	12-20

IV fluid table version 1, 19 Feb 2014

Appendix 10.
Urinary Tract Infection
Child and Infant < 3 Years

Suspect UTI in child or infant, who has fever ≥ 38.0 °C or ≥ 37.5 °C 4 hours apart without an obvious focus

↓

Collect a clean catch urine specimen
If the patient is ill and you cannot wait for them to pass urine obtain catheter sample

Signs and symptoms of UTI / pyelonephritis
Fever
Vomiting
Lethargy
Irritable
Poof feeding
Abdominal pain

↓

Positive urinary sediment result
>10 WBC with < 5 Epithelial cells
Send sample to Mae Sot for culture
(store in fridge until sample sent)

>5 epithelial cells = contaminated sample
REPEAT

All children with ≥2 episodes of UTI should have a renal USS

↓

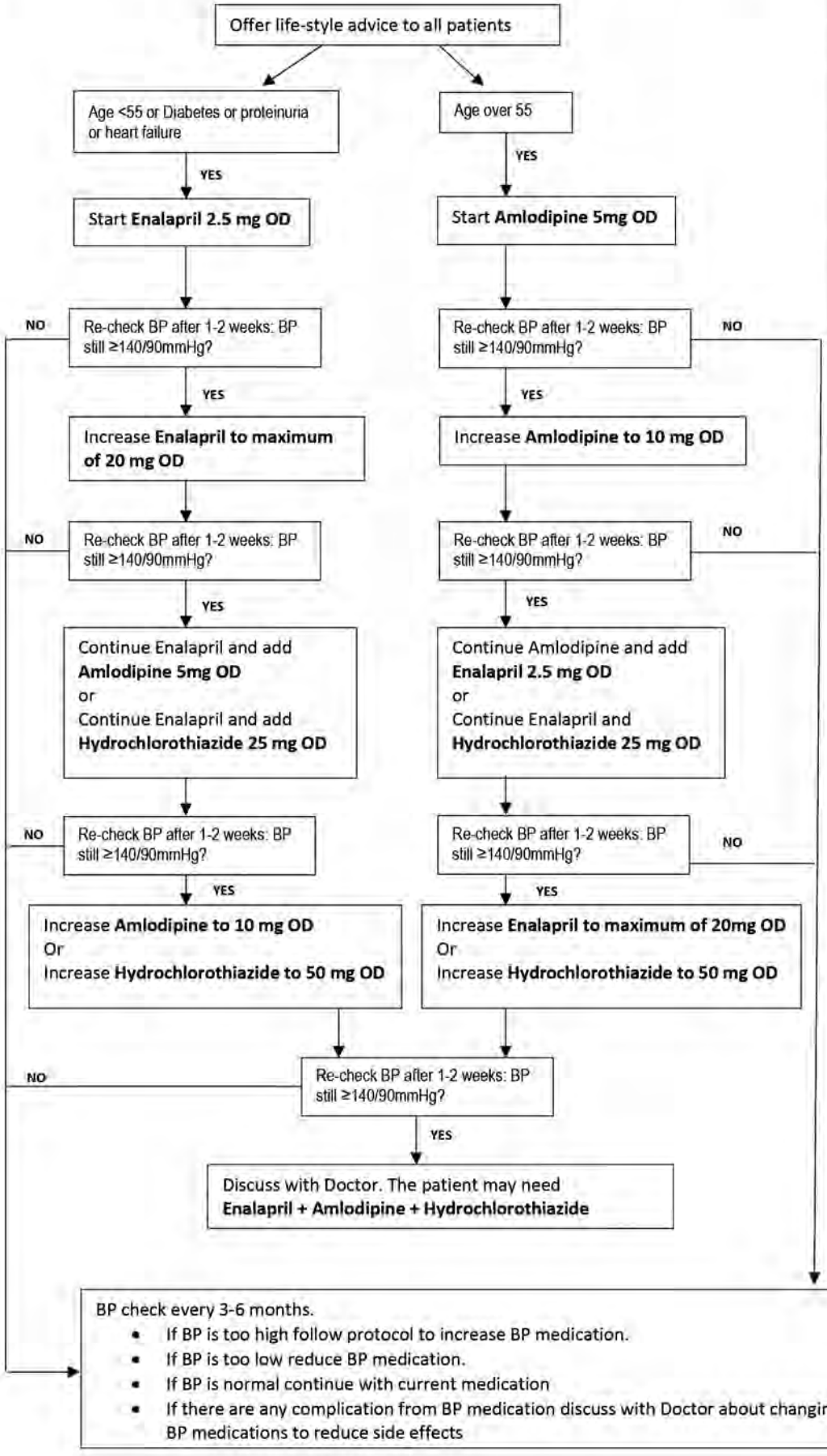
Does the child look Ill?

YES → **Admit**
Take CBC and BC
Start IV Ceftriaxone 50mg/kg BID
Change to oral antibiotics when systemically well and sensitivities are known
Total length of treatment 14 days
After 14 days review and repeat the urinary sediment

NO → Start Ciprofloxacin 7.5mg/kg BID
Infants <1year admit overnight to ensure medicine tolerated
When sensitivities are known antibiotics may be changed
Total length of treatment 7 days
After 7 days review and repeat the urinary sediment

Updated 5 November 2019

Appendix 11. BP medication protocol (can use if the other drugs are available)



Types of BP medication at SMRU

Amlodipine
Start at 5mg OD
Maximum dose 10mg OD

Enalapril
Start at 2.5mg OD
Can increase by 2.5mg until maximum 20mg OD

Hydrochlorothiazide
Start at 25mg OD
Maximum dose 50mg OD

Metoprolol
Start at 25 mg OD
Can increase by 25mg OD until maximum 100 mg OD

Treating BP in specific diseases

Heart failure
Use Enalapril and Metoprolol
Add spironolactone if have fluid overload

After Heart attack
Use Enalapril and Metoprolol

Diabetes
Use Enalapril and Amlodipine

Appendix 12a. Paediatric BP tables for boys

TABLE 4 BP Levels for Boys by Age and Height Percentile

Age (y)	BP Percentile	SBP (mm Hg)							DBP (mm Hg)						
		Height Percentile or Measured Height							Height Percentile or Measured Height						
		5%	10%	25%	50%	75%	90%	95%	5%	10%	25%	50%	75%	90%	95%
1	Height (in)	30.4	30.8	31.6	32.4	33.3	34.1	34.6	30.4	30.8	31.6	32.4	33.3	34.1	34.6
	Height (cm)	77.2	78.3	80.2	82.4	84.6	86.7	87.9	77.2	78.3	80.2	82.4	84.6	86.7	87.9
	50th	85	85	86	86	87	88	88	40	40	40	41	41	42	42
	90th	98	99	99	100	100	101	101	52	52	53	53	54	54	54
	95th	102	102	103	103	104	105	105	54	54	55	55	56	57	57
	95th + 12 mm Hg	114	114	115	115	116	117	117	66	66	67	67	68	69	69
2	Height (in)	33.9	34.4	35.3	36.3	37.3	38.2	38.8	33.9	34.4	35.3	36.3	37.3	38.2	38.8
	Height (cm)	86.1	87.4	89.6	92.1	94.7	97.1	98.5	86.1	87.4	89.6	92.1	94.7	97.1	98.5
	50th	87	87	88	89	89	90	91	43	43	44	44	45	46	46
	90th	100	100	101	102	103	103	104	55	55	56	56	57	58	58
	95th	104	105	105	106	107	107	108	57	58	58	59	60	61	61
	95th + 12 mm Hg	116	117	117	118	119	119	120	69	70	70	71	72	73	73
3	Height (in)	36.4	37	37.9	39	40.1	41.1	41.7	36.4	37	37.9	39	40.1	41.1	41.7
	Height (cm)	92.5	93.9	96.3	99	101.8	104.3	105.8	92.5	93.9	96.3	99	101.8	104.3	105.8
	50th	88	89	89	90	91	92	92	45	46	46	47	48	49	49
	90th	101	102	102	103	104	105	105	58	58	59	59	60	61	61
	95th	106	106	107	107	108	109	109	60	61	61	62	63	64	64
	95th + 12 mm Hg	118	118	119	119	120	121	121	72	73	73	74	75	76	76
4	Height (in)	38.8	39.4	40.5	41.7	42.9	43.9	44.5	38.8	39.4	40.5	41.7	42.9	43.9	44.5
	Height (cm)	98.5	100.2	102.9	105.9	108.9	111.5	113.2	98.5	100.2	102.9	105.9	108.9	111.5	113.2
	50th	90	90	91	92	93	94	94	48	49	49	50	51	52	52
	90th	102	103	104	105	105	106	107	60	61	62	62	63	64	64
	95th	107	107	108	108	109	110	110	63	64	65	66	67	67	68
	95th + 12 mm Hg	119	119	120	120	121	122	122	75	76	77	78	79	79	80
5	Height (in)	41.1	41.8	43.0	44.3	45.5	46.7	47.4	41.1	41.8	43.0	44.3	45.5	46.7	47.4
	Height (cm)	104.4	106.2	109.1	112.4	115.7	118.6	120.3	104.4	106.2	109.1	112.4	115.7	118.6	120.3
	50th	91	92	93	94	95	96	96	51	51	52	53	54	55	55
	90th	103	104	105	106	107	108	108	63	64	65	65	66	67	67
	95th	107	108	109	109	110	111	112	66	67	68	69	70	70	71
	95th + 12 mm Hg	119	120	121	121	122	123	124	78	79	80	81	82	82	83
6	Height (in)	43.4	44.2	45.4	46.8	48.2	49.4	50.2	43.4	44.2	45.4	46.8	48.2	49.4	50.2
	Height (cm)	110.3	112.2	115.3	118.9	122.4	125.6	127.5	110.3	112.2	115.3	118.9	122.4	125.6	127.5
	50th	93	93	94	95	96	97	98	54	54	55	56	57	57	58
	90th	105	105	106	107	109	110	110	66	66	67	68	68	69	69
	95th	108	109	110	111	112	113	114	69	70	70	71	72	72	73
	95th + 12 mm Hg	120	121	122	123	124	125	126	81	82	82	83	84	84	85
7	Height (in)	45.7	46.5	47.8	49.3	50.8	52.1	52.9	45.7	46.5	47.8	49.3	50.8	52.1	52.9
	Height (cm)	116.1	118	121.4	125.1	128.9	132.4	134.5	116.1	118	121.4	125.1	128.9	132.4	134.5
	50th	94	94	95	97	98	98	99	56	56	57	58	58	59	59
	90th	106	107	108	109	110	111	111	68	68	69	70	70	71	71
	95th	110	110	111	112	114	115	116	71	71	72	73	73	74	74
	95th + 12 mm Hg	122	122	123	124	126	127	128	83	83	84	85	85	86	86

Appendix 12a. Paediatric BP tables for boys

TABLE 4 Continued

Age (y)	BP Percentile	SBP (mm Hg)							DBP (mm Hg)						
		Height Percentile or Measured Height							Height Percentile or Measured Height						
		5%	10%	25%	50%	75%	90%	95%	5%	10%	25%	50%	75%	90%	95%
8	Height (in)	47.8	48.6	50	51.6	53.2	54.6	55.5	47.8	48.6	50	51.6	53.2	54.6	55.5
	Height (cm)	121.4	123.5	127	131	135.1	138.8	141	121.4	123.5	127	131	135.1	138.8	141
	50th	95	96	97	98	99	99	100	57	57	58	59	59	60	60
	90th	107	108	109	110	111	112	112	69	70	70	71	72	72	73
	95th	111	112	112	114	115	116	117	72	73	73	74	75	75	75
	95th + 12 mm Hg	123	124	124	126	127	128	129	84	85	85	86	87	87	87
9	Height (in)	49.6	50.5	52	53.7	55.4	56.9	57.9	49.6	50.5	52	53.7	55.4	56.9	57.9
	Height (cm)	126	128.3	132.1	136.3	140.7	144.7	147.1	126	128.3	132.1	136.3	140.7	144.7	147.1
	50th	96	97	98	99	100	101	101	57	58	59	60	61	62	62
	90th	107	108	109	110	112	113	114	70	71	72	73	74	74	74
	95th	112	112	113	115	116	118	119	74	74	75	76	76	77	77
	95th + 12 mm Hg	124	124	125	127	128	130	131	86	86	87	88	88	89	89
10	Height (in)	51.3	52.2	53.8	55.6	57.4	59.1	60.1	51.3	52.2	53.8	55.6	57.4	59.1	60.1
	Height (cm)	130.2	132.7	136.7	141.3	145.9	150.1	152.7	130.2	132.7	136.7	141.3	145.9	150.1	152.7
	50th	97	98	99	100	101	102	103	59	60	61	62	63	63	64
	90th	108	109	111	112	113	115	116	72	73	74	74	75	75	76
	95th	112	113	114	116	118	120	121	76	76	77	77	78	78	78
	95th + 12 mm Hg	124	125	126	128	130	132	133	88	88	89	89	90	90	90
11	Height (in)	53	54	55.7	57.6	59.6	61.3	62.4	53	54	55.7	57.6	59.6	61.3	62.4
	Height (cm)	134.7	137.3	141.5	146.4	151.3	155.8	158.6	134.7	137.3	141.5	146.4	151.3	155.8	158.6
	50th	99	99	101	102	103	104	106	61	61	62	63	63	63	63
	90th	110	111	112	114	116	117	118	74	74	75	75	75	76	76
	95th	114	114	116	118	120	123	124	77	78	78	78	78	78	78
	95th + 12 mm Hg	126	126	128	130	132	135	136	89	90	90	90	90	90	90
12	Height (in)	55.2	56.3	58.1	60.1	62.2	64	65.2	55.2	56.3	58.1	60.1	62.2	64	65.2
	Height (cm)	140.3	143	147.5	152.7	157.9	162.6	165.5	140.3	143	147.5	152.7	157.9	162.6	165.5
	50th	101	101	102	104	106	108	109	61	62	62	62	62	63	63
	90th	113	114	115	117	119	121	122	75	75	75	75	75	76	76
	95th	116	117	118	121	124	126	128	78	78	78	78	78	79	79
	95th + 12 mm Hg	128	129	130	133	136	138	140	90	90	90	90	90	91	91
13	Height (in)	57.9	59.1	61	63.1	65.2	67.1	68.3	57.9	59.1	61	63.1	65.2	67.1	68.3
	Height (cm)	147	150	154.9	160.3	165.7	170.5	173.4	147	150	154.9	160.3	165.7	170.5	173.4
	50th	103	104	105	108	110	111	112	61	60	61	62	63	64	65
	90th	115	116	118	121	124	126	126	74	74	74	75	76	77	77
	95th	119	120	122	125	128	130	131	78	78	78	78	80	81	81
	95th + 12 mm Hg	131	132	134	137	140	142	143	90	90	90	90	92	93	93
14	Height (in)	60.6	61.8	63.8	65.9	68.0	69.8	70.9	60.6	61.8	63.8	65.9	68.0	69.8	70.9
	Height (cm)	153.8	156.9	162	167.5	172.7	177.4	180.1	153.8	156.9	162	167.5	172.7	177.4	180.1
	50th	105	106	109	111	112	113	113	60	60	62	64	65	66	67
	90th	119	120	123	126	127	128	129	74	74	75	77	78	79	80
	95th	123	125	127	130	132	133	134	77	78	79	81	82	83	84
	95th + 12 mm Hg	135	137	139	142	144	145	146	89	90	91	93	94	95	96

Appendix 12a. Paediatric BP tables for boys

TABLE 4 Continued

Age (y)	BP Percentile	SBP (mm Hg)							DBP (mm Hg)						
		Height Percentile or Measured Height							Height Percentile or Measured Height						
		5%	10%	25%	50%	75%	90%	95%	5%	10%	25%	50%	75%	90%	95%
15	Height (in)	62.6	63.8	65.7	67.8	69.8	71.5	72.5	62.6	63.8	65.7	67.8	69.8	71.5	72.5
	Height (cm)	159	162	166.9	172.2	177.2	181.6	184.2	159	162	168.9	172.2	177.2	181.6	184.2
	50th	108	110	112	113	114	114	114	61	62	64	65	66	67	68
	90th	123	124	126	128	129	130	130	75	76	78	79	80	81	81
	95th	127	129	131	132	134	135	135	78	79	81	83	84	85	85
	95th + 12 mm Hg	139	141	143	144	146	147	147	90	91	93	95	96	97	97
16	Height (in)	63.8	64.9	66.8	68.8	70.7	72.4	73.4	63.8	64.9	66.8	68.8	70.7	72.4	73.4
	Height (cm)	162.1	165	169.6	174.6	179.5	183.8	186.4	162.1	165	169.6	174.6	179.5	183.8	186.4
	50th	111	112	114	115	115	116	116	63	64	66	67	68	69	69
	90th	126	127	128	129	131	131	132	77	78	79	80	81	82	82
	95th	130	131	133	134	135	136	137	80	81	83	84	85	86	86
	95th + 12 mm Hg	142	143	145	146	147	148	149	92	93	95	96	97	98	98
17	Height (in)	64.5	65.5	67.3	69.2	71.1	72.8	73.8	64.5	65.5	67.3	69.2	71.1	72.8	73.8
	Height (cm)	163.8	166.5	170.9	175.8	180.7	184.9	187.5	163.8	166.5	170.9	175.8	180.7	184.9	187.5
	50th	114	115	116	117	117	118	118	65	66	67	68	69	70	70
	90th	128	129	130	131	132	133	134	78	79	80	81	82	82	83
	95th	132	133	134	135	137	138	138	81	82	84	85	86	86	87
	95th + 12 mm Hg	144	145	146	147	149	150	150	93	94	96	97	98	98	99

Use percentile values to stage BP readings according to the scheme in Table 3 (elevated BP: ≥90th percentile; stage 1 HTN: ≥95th percentile, and stage 2 HTN: ≥95th percentile + 12 mm Hg). The 50th, 90th, and 95th percentiles were derived by using quantile regression on the basis of normal-weight children (BMI <85th percentile).[77]

Appendix 12. Paediatric BP tables for girls

TABLE 5 BP Levels for Girls by Age and Height Percentile

Age (y)	BP Percentile	SBP (mm Hg)							DBP (mm Hg)						
		Height Percentile or Measured Height							Height Percentile or Measured Height						
		5%	10%	25%	50%	75%	90%	95%	5%	10%	25%	50%	75%	90%	95%
1	Height (in)	29.7	30.2	30.9	31.8	32.7	33.4	33.9	29.7	30.2	30.9	31.8	32.7	33.4	33.9
	Height (cm)	75.4	76.6	78.6	80.8	83	84.9	86.1	75.4	76.6	78.6	80.8	83	84.9	86.1
	50th	84	85	86	88	87	88	88	41	42	42	43	44	45	46
	90th	98	99	99	100	101	102	102	54	55	56	56	57	58	58
	95th	101	102	102	103	104	105	105	59	59	60	60	61	62	62
	95th + 12 mm Hg	113	114	114	115	116	117	117	71	71	72	72	73	74	74
2	Height (in)	33.4	34	34.9	35.9	36.9	37.8	38.4	33.4	34	34.9	35.9	36.9	37.8	38.4
	Height (cm)	84.9	86.3	88.6	91.1	93.7	96	97.4	84.9	86.3	88.6	91.1	93.7	96	97.4
	50th	87	87	88	89	90	91	91	45	46	47	48	49	50	51
	90th	101	101	102	103	104	105	106	58	58	59	60	61	62	62
	95th	104	105	106	106	107	108	109	62	63	63	64	65	66	66
	95th + 12 mm Hg	116	117	118	118	119	120	121	74	75	75	76	77	78	78
3	Height (in)	35.8	36.4	37.3	38.4	39.6	40.6	41.2	35.8	36.4	37.3	38.4	39.6	40.6	41.2
	Height (cm)	91	92.4	94.9	97.6	100.5	103.1	104.6	91	92.4	94.9	97.6	100.5	103.1	104.6
	50th	88	89	89	90	91	92	93	48	48	49	50	51	53	53
	90th	102	103	104	104	105	106	107	60	61	61	62	63	64	65
	95th	106	106	107	108	109	110	110	64	65	65	66	67	68	69
	95th + 12 mm Hg	118	118	119	120	121	122	122	76	77	77	78	79	80	81
4	Height (in)	38.3	38.9	39.9	41.1	42.4	43.5	44.2	38.3	38.9	39.9	41.1	42.4	43.5	44.2
	Height (cm)	97.2	98.8	101.4	104.5	107.6	110.5	112.2	97.2	98.8	101.4	104.5	107.6	110.5	112.2
	50th	89	90	91	92	93	94	94	50	51	51	53	54	55	55
	90th	103	104	105	106	107	108	108	62	63	64	65	66	67	67
	95th	107	108	109	109	110	111	112	66	67	68	69	70	70	71
	95th + 12 mm Hg	119	120	121	121	122	123	124	78	79	80	81	82	82	83
5	Height (in)	40.8	41.5	42.6	43.9	45.2	46.5	47.3	40.8	41.5	42.6	43.9	45.2	46.5	47.3
	Height (cm)	103.6	105.3	108.2	111.5	114.9	118.1	120	103.6	105.3	108.2	111.5	114.9	118.1	120
	50th	90	91	92	93	94	95	96	52	52	53	55	56	57	57
	90th	104	105	106	107	108	109	110	64	65	66	67	68	69	70
	95th	108	109	109	110	111	112	113	68	69	70	71	72	73	73
	95th + 12 mm Hg	120	121	121	122	123	124	125	80	81	82	83	84	85	85
6	Height (in)	43.3	44	45.2	46.6	48.1	49.4	50.3	43.3	44	45.2	46.6	48.1	49.4	50.3
	Height (cm)	110	111.8	114.9	118.4	122.1	125.6	127.7	110	111.8	114.9	118.4	122.1	125.6	127.7
	50th	92	92	93	94	96	97	97	54	54	55	56	57	58	59
	90th	105	106	107	108	109	110	111	67	67	68	69	70	71	71
	95th	109	109	110	111	112	113	114	70	71	72	72	73	74	74
	95th + 12 mm Hg	121	121	122	123	124	125	126	82	83	84	84	85	86	86
7	Height (in)	45.6	46.4	47.7	49.2	50.7	52.1	53	45.6	46.4	47.7	49.2	50.7	52.1	53
	Height (cm)	115.9	117.8	121.1	124.9	128.8	132.5	134.7	115.9	117.8	121.1	124.9	128.8	132.5	134.7
	50th	92	93	94	95	97	98	99	55	55	56	57	58	59	60
	90th	106	106	107	109	110	111	112	68	68	69	70	71	72	72
	95th	109	110	111	112	113	114	115	72	72	73	73	74	74	75
	95th + 12 mm Hg	121	122	123	124	125	126	127	84	84	85	85	86	86	87

TABLE 5 Continued

Age (y)	BP Percentile	SBP (mm Hg)							DBP (mm Hg)						
		Height Percentile or Measured Height							Height Percentile or Measured Height						
		5%	10%	25%	50%	75%	90%	95%	5%	10%	25%	50%	75%	90%	95%
8	Height (in)	47.6	48.4	49.8	51.4	53	54.5	55.5	47.6	48.4	49.8	51.4	53	54.5	55.5
	Height (cm)	121	123	126.5	130.6	134.7	138.5	140.9	121	123	126.5	130.6	134.7	138.5	140.9
	50th	93	94	95	97	98	99	100	56	56	57	59	60	61	61
	90th	107	107	108	110	111	112	113	69	70	71	72	72	73	73
	95th	110	111	112	113	115	116	117	72	73	74	74	75	75	75
	95th + 12 mm Hg	122	123	124	125	127	128	129	84	85	86	86	87	87	87
9	Height (in)	49.3	50.2	51.7	53.4	55.1	56.7	57.7	49.3	50.2	51.7	53.4	55.1	56.7	57.7
	Height (cm)	125.3	127.6	131.3	135.6	140.1	144.1	146.6	125.3	127.6	131.3	135.6	140.1	144.1	146.6
	50th	95	95	97	98	99	100	101	57	58	59	60	60	61	61
	90th	108	108	109	111	112	113	114	71	71	72	73	73	73	73
	95th	112	112	113	114	116	117	118	74	74	75	75	75	75	75
	95th + 12 mm Hg	124	124	125	126	128	129	130	86	86	87	87	87	87	87
10	Height (in)	51.1	52	53.7	55.5	57.4	59.1	60.2	51.1	52	53.7	55.5	57.4	59.1	60.2
	Height (cm)	129.7	132.2	136.3	141	145.8	150.2	152.8	129.7	132.2	136.3	141	145.8	150.2	152.8
	50th	96	97	98	99	101	102	103	58	59	59	60	61	61	62
	90th	109	110	111	112	113	115	116	72	73	73	73	73	73	73
	95th	113	114	114	116	117	119	120	75	75	76	76	76	76	76
	95th + 12 mm Hg	125	126	126	128	129	131	132	87	87	88	88	88	88	88
11	Height (in)	53.4	54.5	56.2	58.2	60.2	61.9	63	53.4	54.5	56.2	58.2	60.2	61.9	63
	Height (cm)	135.6	138.3	142.8	147.8	152.8	157.3	160	135.6	138.3	142.8	147.8	152.8	157.3	160
	50th	98	99	101	102	104	105	106	60	60	60	61	62	63	64
	90th	111	112	113	114	116	118	120	74	74	74	74	74	75	75
	95th	115	116	117	118	120	123	124	76	77	77	77	77	77	77
	95th + 12 mm Hg	127	128	129	130	132	135	136	88	89	89	89	89	89	89
12	Height (in)	56.2	57.3	59	60.9	62.8	64.5	65.5	56.2	57.3	59	60.9	62.8	64.5	65.5
	Height (cm)	142.8	145.5	149.9	154.8	159.6	163.8	166.4	142.8	145.5	149.9	154.8	159.6	163.8	166.4
	50th	102	102	104	105	107	108	108	61	61	61	62	64	65	65
	90th	114	115	116	118	120	122	122	75	75	75	75	76	76	76
	95th	118	119	120	122	124	125	126	78	78	78	78	79	79	79
	95th + 12 mm Hg	130	131	132	134	136	137	138	90	90	90	90	91	91	91
13	Height (in)	58.3	59.3	60.9	62.7	64.5	66.1	67	58.3	59.3	60.9	62.7	64.5	66.1	67
	Height (cm)	148.1	150.6	154.7	159.2	163.7	167.8	170.2	148.1	150.6	154.7	159.2	163.7	167.8	170.2
	50th	104	105	106	107	108	108	109	62	62	63	64	65	65	66
	90th	116	117	119	121	122	123	123	75	75	75	76	76	76	76
	95th	121	122	123	124	126	126	127	79	79	79	79	80	80	81
	95th + 12 mm Hg	133	134	135	136	138	138	139	91	91	91	91	92	92	93
14	Height (in)	59.3	60.2	61.8	63.5	65.2	66.8	67.7	59.3	60.2	61.8	63.5	65.2	66.8	67.7
	Height (cm)	150.6	153	156.9	161.3	165.7	169.7	172.1	150.6	153	156.9	161.3	165.7	169.7	172.1
	50th	105	106	107	108	109	109	109	63	63	64	65	66	66	66
	90th	118	118	120	122	123	123	123	76	76	76	76	77	77	77
	95th	123	123	124	125	126	127	127	80	80	80	80	81	81	82
	95th + 12 mm Hg	135	135	136	137	138	139	139	92	92	92	92	93	93	94

Appendix 12b. Paediatric BP tables for girls

TABLE 5 Continued

Age (y)	BP Percentile	SBP (mm Hg)						DBP (mm Hg)					
		Height Percentile or Measured Height						Height Percentile or Measured Height					
		5%	10%	25%	50%	75%	90%	95%	5%	10%	25%	50%	75%	90%	95%
15	Height (in)	59.7	60.6	62.2	63.9	65.6	67.2	68.1	59.7	60.6	62.2	63.9	65.6	67.2	68.1
	Height (cm)	151.7	154	157.9	162.3	166.7	170.6	173	151.7	154	157.9	162.3	166.7	170.6	173
	50th	105	106	107	108	109	109	109	64	64	64	65	66	67	67
	90th	118	119	121	122	123	123	124	76	76	76	77	77	78	78
	95th	124	124	125	126	127	127	128	80	80	80	81	82	82	82
	95th + 12 mm Hg	136	136	137	138	139	139	140	92	92	92	93	94	94	94
16	Height (in)	59.9	60.8	62.4	64.1	65.8	67.3	68.3	59.9	60.8	62.4	64.1	65.8	67.3	68.3
	Height (cm)	152.1	154.5	158.4	162.8	167.1	171.1	173.4	152.1	154.5	158.4	162.8	167.1	171.1	173.4
	50th	106	107	108	109	109	110	110	64	64	65	66	66	67	67
	90th	119	120	122	123	124	124	124	76	76	76	77	78	78	78
	95th	124	125	125	127	127	128	128	80	80	80	81	82	82	82
	95th + 12 mm Hg	136	137	137	139	139	140	140	92	92	92	93	94	94	94
17	Height (in)	60.0	60.9	62.5	64.2	65.9	67.4	68.4	60.0	60.9	62.5	64.2	65.9	67.4	68.4
	Height (cm)	152.4	154.7	158.7	163.0	167.4	171.3	173.7	152.4	154.7	158.7	163.0	167.4	171.3	173.7
	50th	107	108	109	110	110	110	111	64	64	65	66	66	66	67
	90th	120	121	123	124	124	125	125	76	76	77	77	78	78	78
	95th	125	125	126	127	128	128	128	80	80	80	81	82	82	82
	95th + 12 mm Hg	137	137	138	139	140	140	140	92	92	92	93	94	94	94

Use percentile values to stage BP readings according to the scheme in Table 3 (elevated BP: ≥90th percentile; stage 1 HTN: ≥95th percentile; and stage 2 HTN: ≥95th percentile + 12 mm Hg). The 50th, 90th, and 95th percentiles were derived by using quantile regression on the basis of normal-weight children (BMI <85th percentile).[77]

The initial BP measurement may be oscillometric (on a calibrated machine that has been validated for use in the pediatric population) or auscultatory (by using a mercury or aneroid sphygmomanometer[86,87]). (Validation status for oscillometric BP devices, including whether they are validated in the pediatric age group, can be checked at www.dableducational.org.) BP should be measured in the right arm by using standard measurement practices unless the child has atypical aortic arch anatomy, such as right aortic arch and aortic coarctation or left aortic arch with aberrant right subclavian artery (see Table 7). Other important aspects of proper BP measurement are illustrated in an AAP video available at http://youtu.be/JLzkNBpqwi0. Care should be taken that providers follow an accurate and consistent measurement technique.[88,89]

An appropriately sized cuff should be used for accurate BP measurement.[83] Researchers in 3 studies in the United Kingdom and 1 in Brazil documented the lack of availability of an appropriately sized cuff in both the inpatient and outpatient settings.[91–94] Pediatric offices should have access to a wide range of cuff sizes, including a thigh cuff for use in children and adolescents with severe obesity. For children in whom the appropriate cuff size is difficult to determine, the midarm circumference (measured as the midpoint between the acromion of the scapula and olecranon of the elbow, with the shoulder in a neutral position and the elbow flexed to 90°[86,95,96]) should be obtained for an accurate determination of the correct cuff size (see Fig 2 and Table 7).[95]

If the initial BP is elevated (≥90th percentile), providers should perform 2 additional oscillometric or auscultatory BP measurements at the same visit and average them. If using auscultation, this averaged measurement is used to determine the child's BP category (ie, normal,

APPENDICES

SOP title	Haemolysis_SOP_Clinical_v3.1
Version No.	V3.1
DATE OF ISSUE	18 Nov 2019
ORIGINAL AUTHOR	Cindy Chu
REVIEWED BY	Germana Bancone
AUTHORISED BY & DATE	Cindy Chu 18 Nov 2019
LOCATION OF MASTER DOCUMENT	T:\Medical\Clinical SOPs

Document Review History

Version	Reviewed By & Date	Changes made	Date of Issue
1	C Chu, 4 May 2018	New SOP (study specific)	4 May 2018
2.1	C Chu, 27 June 2018	Formatted to the SOP template. Added haemoglobin sampling to the alert and action points.	27 June 2018
3	C Chu, 24 Sep 2018	Changed SOP from study specific to clinical. Clinical details added. Contact information added.	24 Sep 2018
3.1	C Chu, 4 Nov 2019	Administrative changes. Added sections on 'Background information' and 'Points to consider'	5 Nov 2019

SOP TITLE

Management of Haemoglobin or Haematocrit reduction caused by hemolytic agents

PURPOSE AND SCOPE

This SOP covers the management of haemoglobin (Hb) or haematocrit(hct) reductions that are caused by hemolytic agents, especially in relation to G6PD deficiency.

BACKGROUND INFORMATION

G6PD deficiency is an enzyme problem inside the red blood cell (RBC). Some drugs and environmental agents cause oxidative stress and RBC's deficient in G6PD activity will haemolyse more quickly than RBC's with normal G6PD activity. The fluorescent spot test (currently used at SMRU labs) and Carestart rapid diagnostic test (RDT) can be used to determine if a patient is normal or abnormal for G6PD deficiency. Some individuals, notably females, are heterozygotes and will have a wide range of G6PD activity; deficient, intermediate or normal. The intermediate females will be diagnosed as G6PD normal on the G6PD tests that give a normal or abnormal result (qualitative tests). The SMRU studies using high dose primaquine, a haemolytic drug, show that G6PD intermediate females are also at risk for haemolysis. Therefore, you must be careful with diagnosing G6PD activity when female patients are presenting with acute haemolysis and anaemia.

POINTS TO CONSIDER

1. For patients who present for the first time, you may not know the baseline haematocrit or haemoglobin. In these cases, you need to make a careful assessment to know the diagnosis.
2. If the patient is in shock, refer to the BBG guidelines for management.
3. Do a complete medical history including medications taken and any environmental exposures (naphthalene balls, pesticides, traditional treatment).
4. Admit to the IPD for close observation.

Appendix 13. Clinical haemolysis SOP

5. Repeat haematocrit at least daily. You may want to check more often if the patient is not stable. Continue to follow haematocrit until it improves. See below for other investigations to follow.
6. When you give blood transfusions, you may want the donor to be G6PD normal. This means the donor should have a normal G6PD test AND be a male or female with known genotype.
7. There are new tests that give a quantitative G6PD activity results. These tests can diagnose G6PD intermediate females. We can use quantitative tests to find the people who might be at risk for haemolysis.

ALERT POINTS

1. If the Hb/Hct result is 10% different from the previous sample, repeat the sample or compare the clinic Hb/Hct result with the CBC Hb/Hct result.
2. Signs of anaemia due to significant haemolysis
    a. Tachycardia and/or tachypnea
    b. Low BP
    c. Pallor
3. Symptoms of anaemia due to significant haemolysis
    a. Dyspnoea or dyspnea on exertion (more than baseline)
    b. Fatigue or tiredness
    c. Dizziness
    d. Palpitations
4. The biggest danger for severe haemolysis is acute kidney injury. This is caused by damage from the contents inside the RBC that are now in the blood (because the RBC is lysed) and are being filtered in the kidney (like Hb). Some patients can develop renal failure and require dialysis.
5. Compare all Hb/Hct to pre-dose or pre-haemolysis levels (this is called the fractional change).

    Fractional change = (Current Hb/ Hct– pre-haemolysis Hb/Hct) / (Pre-haemolysis Hb/Hct)
6. If the fractional Hb/Hct change is >25% or if absolute Hb decreases >3g/dL or if absolute Hct decreases >10%, call the doctor.

ACTION POINTS

If fractional drop > 30% or Hb is < 7 g/dL or the patient has severe symptoms of anaemia

1. Stop the medication, environmental exposure or other haemolytic agent.
2. Call site doctor. For more advice, can call Cindy or Germana in the haematology lab.
3. Take blood samples (Clinical information "drug induced haemolysis")
    - Hematocrit and malaria smear
    - Urine stick (please document urobilinogen)
    - Urine pregnancy test
    - CBC, reticulocyte count – send to Mae Sot lab.
    - G6PD spectro, G6PD genotype may not be necessary for clinical care but are useful for additional information and research purposes. For more advice, can call Cindy or Germana.
    - Haptoglobin level – send to **PCT** *(need to write in 'other')*
    - Liver function tests (ALT, AST, total and direct bilirubin, and LDH) – send to **PCT**
    - Kidney function tests (BUN, creatinine) – send to **PCT**
4. If Hb is <6g/dL or Hct <21%, give blood transfusion. Try to find a donor who is G6PD normal AND male or a female that we know is not a G6PD heterozygote. The risk for acute kidney injury is less if there is no more haemolysis.
5. Make an anaemia treatment plan based on SMRU guidelines. Be careful when prescribing Vitamin C. Large doses can cause haemolysis in G6PD deficiency.

Appendix 14. IV IRON (VENOFER) PROTOCOL

Before you start:

- Make sure you have a patient with significant iron deficiency (ferritin <30) and anemia. **Do not give if ferritin is high or normal.**
- Calculate the dose you need:

Required iron dose (mg) = (2.4 × (target Hb-actual Hb) × pre-pregnancy weight (kg)) + 1000 mg for replenishment of stores For pregnant women: target Hb = 12 g/dl (~ 36% HCT) Calculate actual Hb = HCT/3 (eg. hct =27%, Hb=9 g/dL)

- Plan the schedule of infusions (maximum 200 mg per infusion, maximum 3 infusions per week). Monthly or every 2 weeks is okay if patient lives far.
- Ask if she has ever had a bad reaction to IV iron before. Tell her to inform the staff if she feels flushing, hot, dyspnea, itching, tingling, sweating, palpitations etc.
- Make sure you have adrenaline and syringe nearby – very low risk (~ 3 in 1 million) for anaphylaxis but be ready.

Procedure:

- Put in IV line, start close observation sheet, and check vital signs.
- Mix 1 vial (5 ml, 100 mg) Venofer with 95 ml NSS in metroset.
- Start infusion at 28 dpm x 5 min and repeat VS after 5 min. Ask symptoms.
- If VS normal and no symptoms, continue infusion at ~5 ml/min (too fast to count the drops).
- Check VS and symptoms every 10 minutes (or every 50 ml).
- Mix another 1 vial Venofer with 95 ml NSS and give at ~5 ml/min.

Note: you need to give 100 ml over **at least** 15 minutes, and 200 ml over **at least** 30 minutes. If you take more time (eg. 1 hr for 200 mg) you will have less risk of side effects. If the patient complains of flushing but is clinically stable and no signs of anaphylaxis, slow down the infusion and monitor the symptoms and vital signs.

Appendix 15. Febrile Infant and Child Protocol

Unwell child or infant less than 3 years with fever ≥ 38.0 °C or ≥ 37.5 °C 4 hours apart

↓

Assess for Emergency

Take a full history and perform an examination

↓

Malaria smear – if positive consider other diagnosis as well

↓

For neonates see the Neonatal Guidelines

What is the child's main symptom?

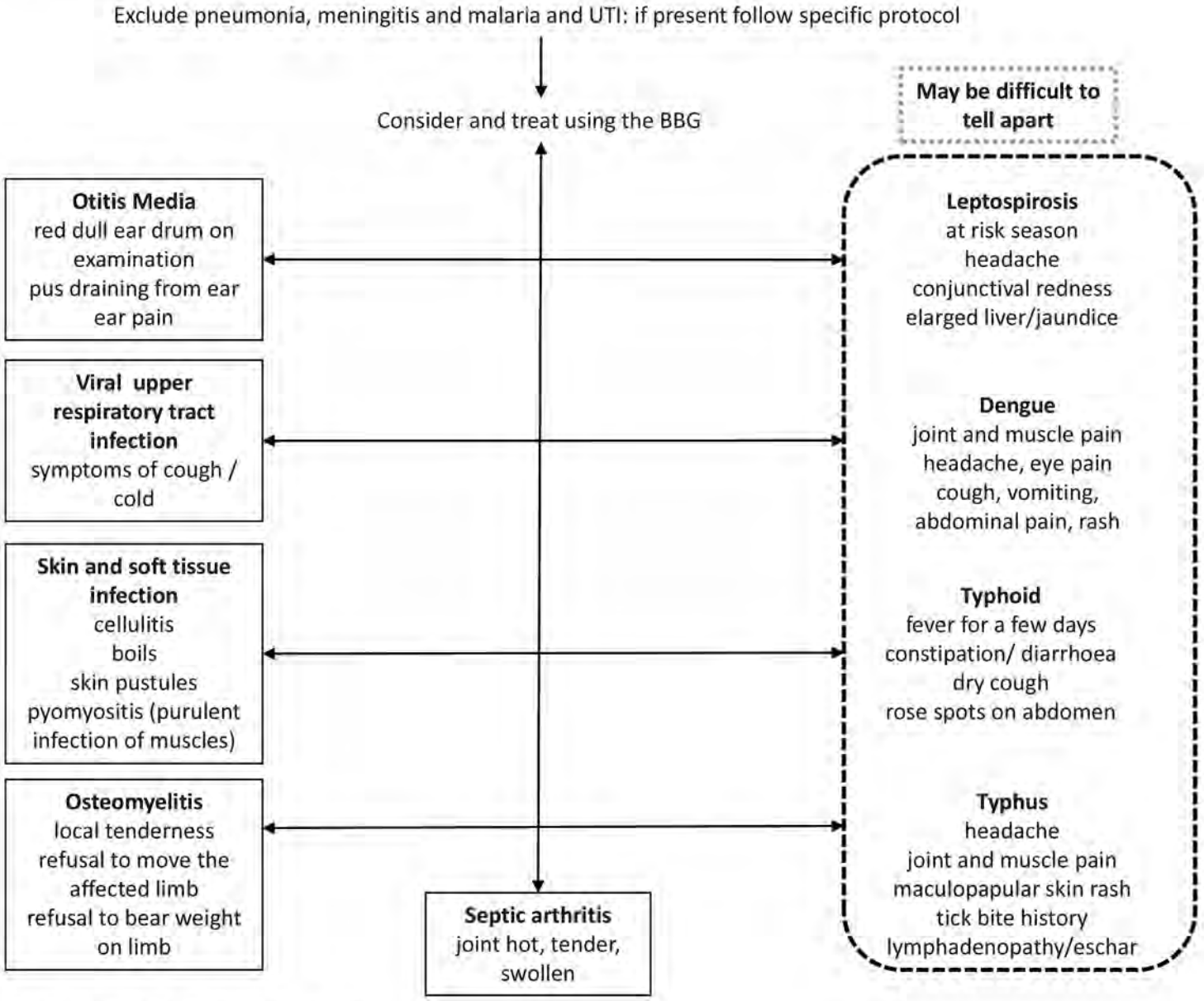
- **Difficulty in breathing and cough** → **Acute Respiratory Distress Protocol**
- **Diarrhoea** → **Gastroenteritis Treatment Protocol**
- **Irritability, neck stiffness or bulging fontanelle** → **Meningitis Treatment Protocol**
- **Fever** → Consider the differential diagnosis → Child unwell and no focus of infection can be found on examination → Take a FULL Septic Screen, CBC, Blood culture (CRP), Urine sample (clean catch, catheter), Lumbar puncture → Start IV ceftriaxone 50mg/kg BID if meningitis ; OD if sepsis

Consider other available tests; Scrub RDT, Dengue RDT. Discuss with doctor for Chikungunya testing.

All infants presenting with a fever and not focus to explain the fever should have a urine examined to exclude a UTI

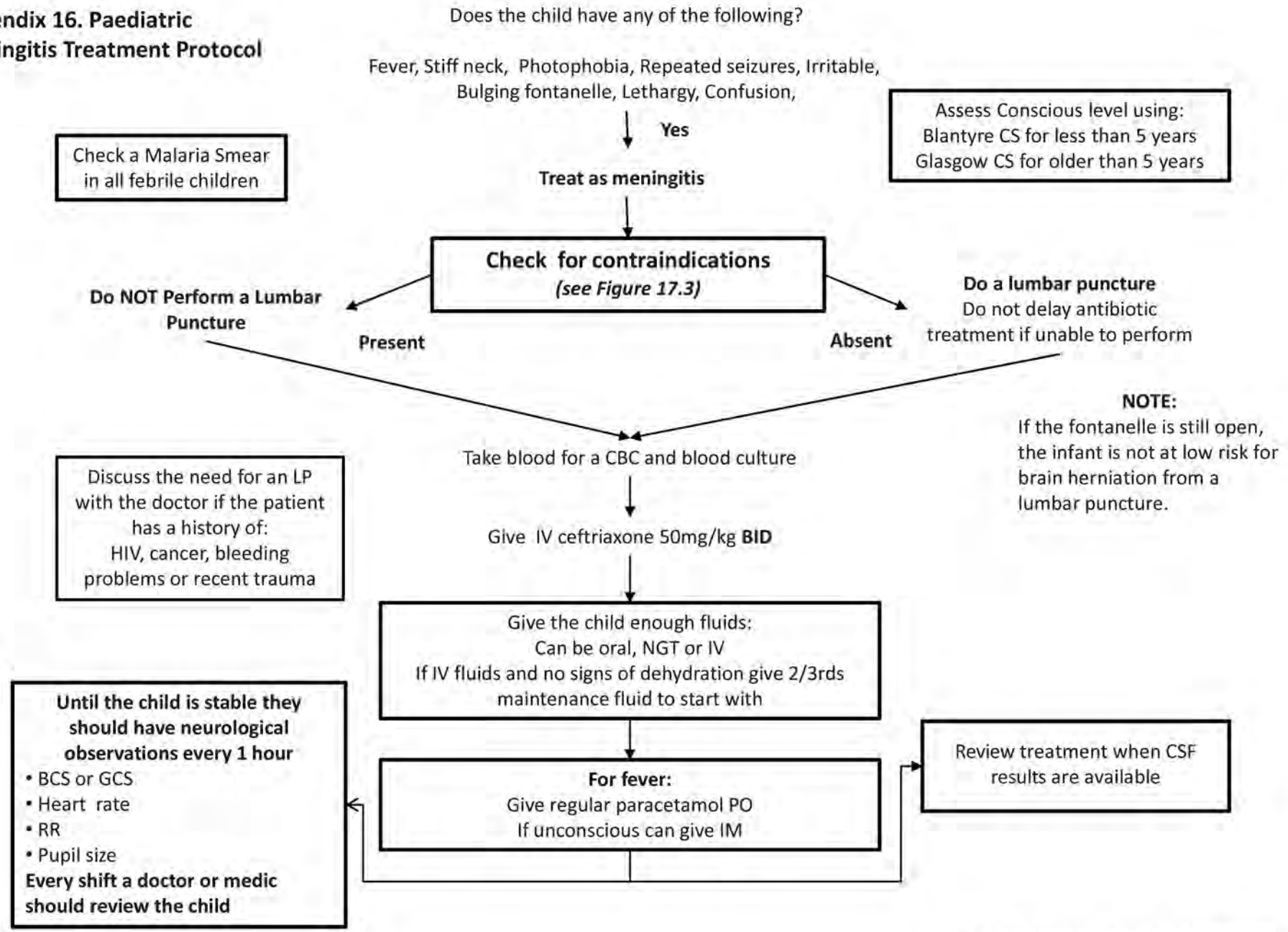
Updated 6 Nov 2019 from the Paediatric Guidelines Nov 2010

Appendix 15. Differential Diagnosis of Febrile Infant or Child



No changes made from Paediatric Guidelines Nov 2010

Appendix 16. Paediatric Meningitis Treatment Protocol



Meningitis protocol updated 5 Nov 2019

APPENDICES

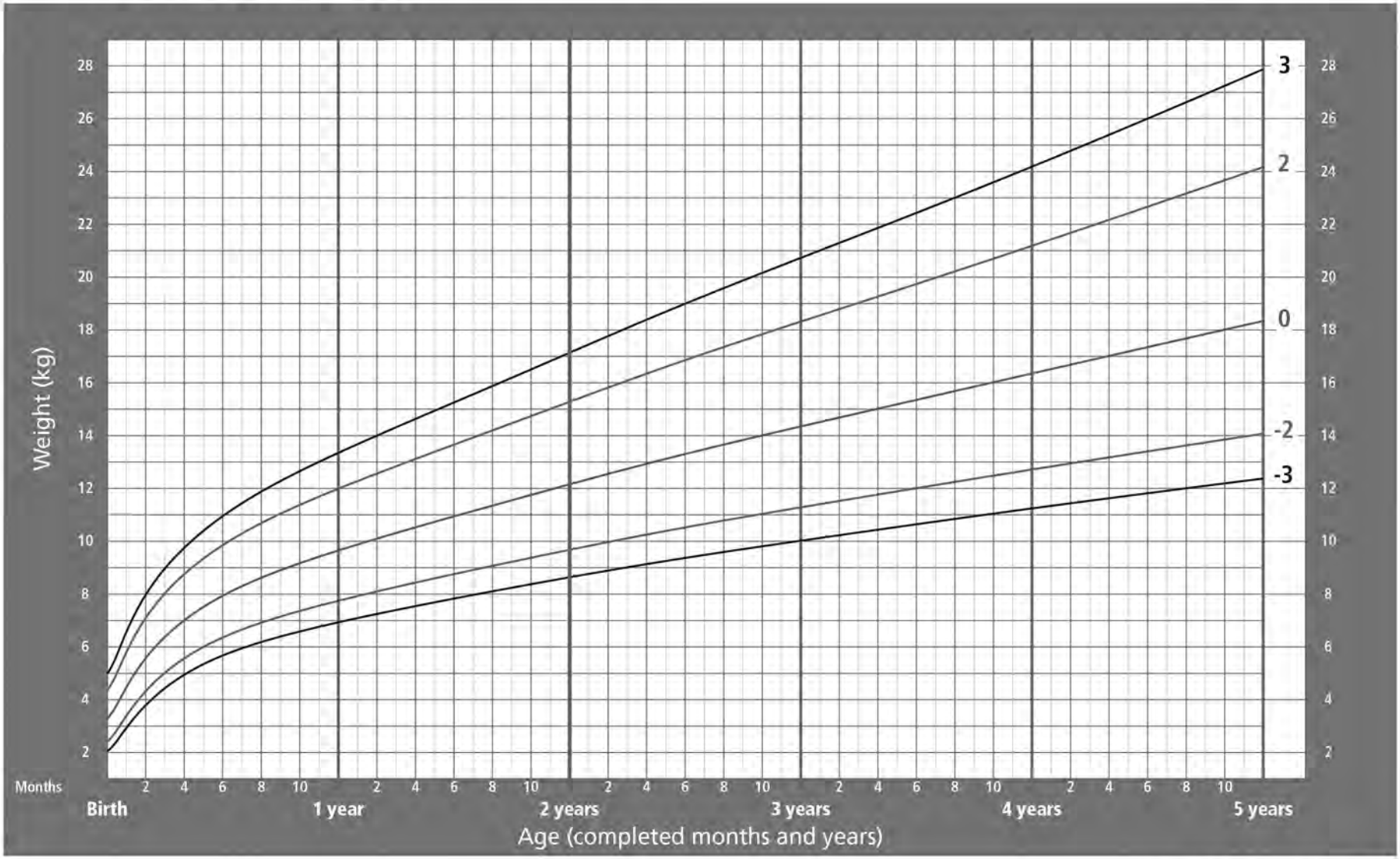
Appendix 17. Antibiotic Classes

Class	*Antibiotic*	*Mechanism of Action*	*Antibiotic spectrum*
Penicillins	Amoxicillin	Beta lactam drug that blocks cell wall synthesis	gram+, some gm-, some anaerobes
	Penicillin		
	Ampicillin		
	Cloxacillin		*Staph aureus*
	Augmentin (Amoxi/Clavulanate)		gm+ (*S. aureus*) & gm- beta lactamase
Extended Spectrum PCN	Piperacillin (UreidoPCN)	Beta lactam drug that blocks cell wall synthesis	gm+ and gm-, *Pseudomonas* & *Enterobacter* (hospital infection)
	Ticarcillin (CarboxyPCN)		
Vancomycin		Glycopeptide drug that blocks cell wall synthesis	*S. aureus* resistant to PCNs
Clindamycin		Blocks protein synthesis	gm+, anaerobes
Metronidazole			anaerobes
Tetracyclines	Doxycycline	Blocks protein synthesis	gm+, gm-, atypical organisms (*Rickettsia*)
	Minocycline		
	Tetracycline		
Macrolides	Erythromycin	Blocks protein synthesis	Atypical organisms (*Mycoplasma*), gm+, some gm- (*Bordetella pertussis* and *S. typhi* for azithro)
	Azithromycin		
	Clarithromycin		
Sulfa	Cotrimazole (Trimethoprim/Sulfa)	Blocks folic acid synthesis	gm+, gm-
Chloramphenicol		Blocks protein synthesis	gm+, gm-, anaerobes
Cephalosporins	1st generation: Cephalexin, Cefazolin	Beta lactam drug that blocks cell wall synthesis	gm+, some gm-
	2nd generation: Cefuroxime, Cefaclor, Cefoxitin		gm+, more gm- than 1st generation
	3rd generation: Ceftriaxone, Cefotaxime, Ceftazidime		gm+, more gm- than 2nd generation
	4th generation: Cefipime		same as 3rd generation
Monobactam	Aztreonam	Beta lactam drug that blocks cell wall synthesis	gm-, anaerobes
Carbapenem	Imipenem	Beta lactam drug that blocks cell wall synthesis	gm+, gm-, anaerobes, *Enterobacter* (hospital infection)
	Meropenem		
Aminoglycosides	Gentamicin	Blocks protein synthesis	gm-
	Amikacin		
	Tobramycin		
Fluoroquinolones	1st generation: Norfloxacin	Blocks DNA synthesis	gm-
	2nd generation: Ciprofloxacin, Levofloxacin, Ofloxacin		gm- (especially Cipro), atypical organisms, Levofloxacin good for *S. aureus* & *S. pneumoniae*
	3rd generation: Gatifloxacin		more gm+ than 1st or 2nd generation
	4th generation: Moxifloxacin, Trovofloxacin		gm+, gm- and anaerobes
Oxazoladinone	Linezolid		gm+, some gm-, anaerobes

Appendix 18. Weight-for-age BOYS

Birth to 5 years (z-scores)

World Health Organization

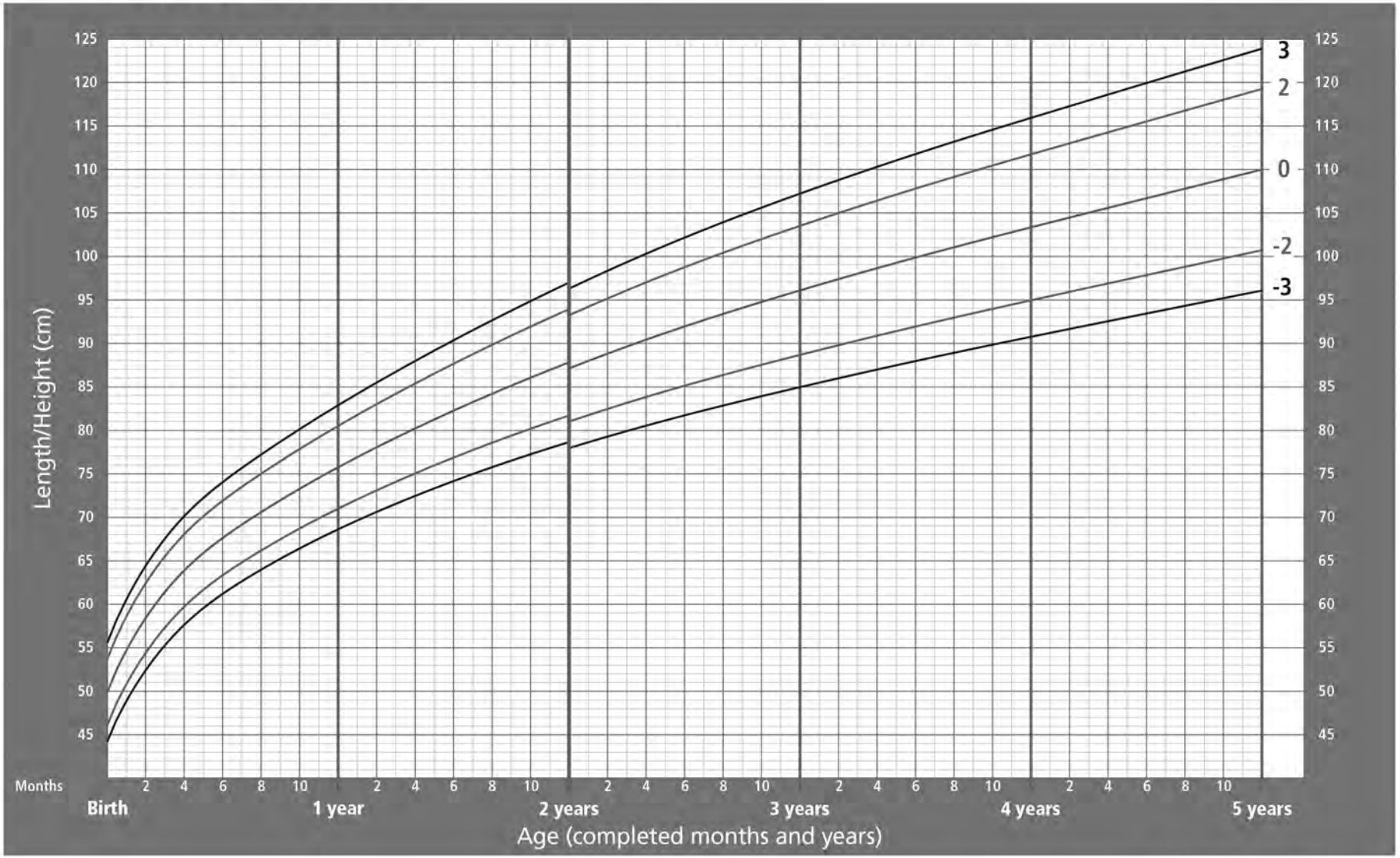


WHO Child Growth Standards

Appendix 18. Length/height-for-age BOYS

World Health Organization

Birth to 5 years (z-scores)

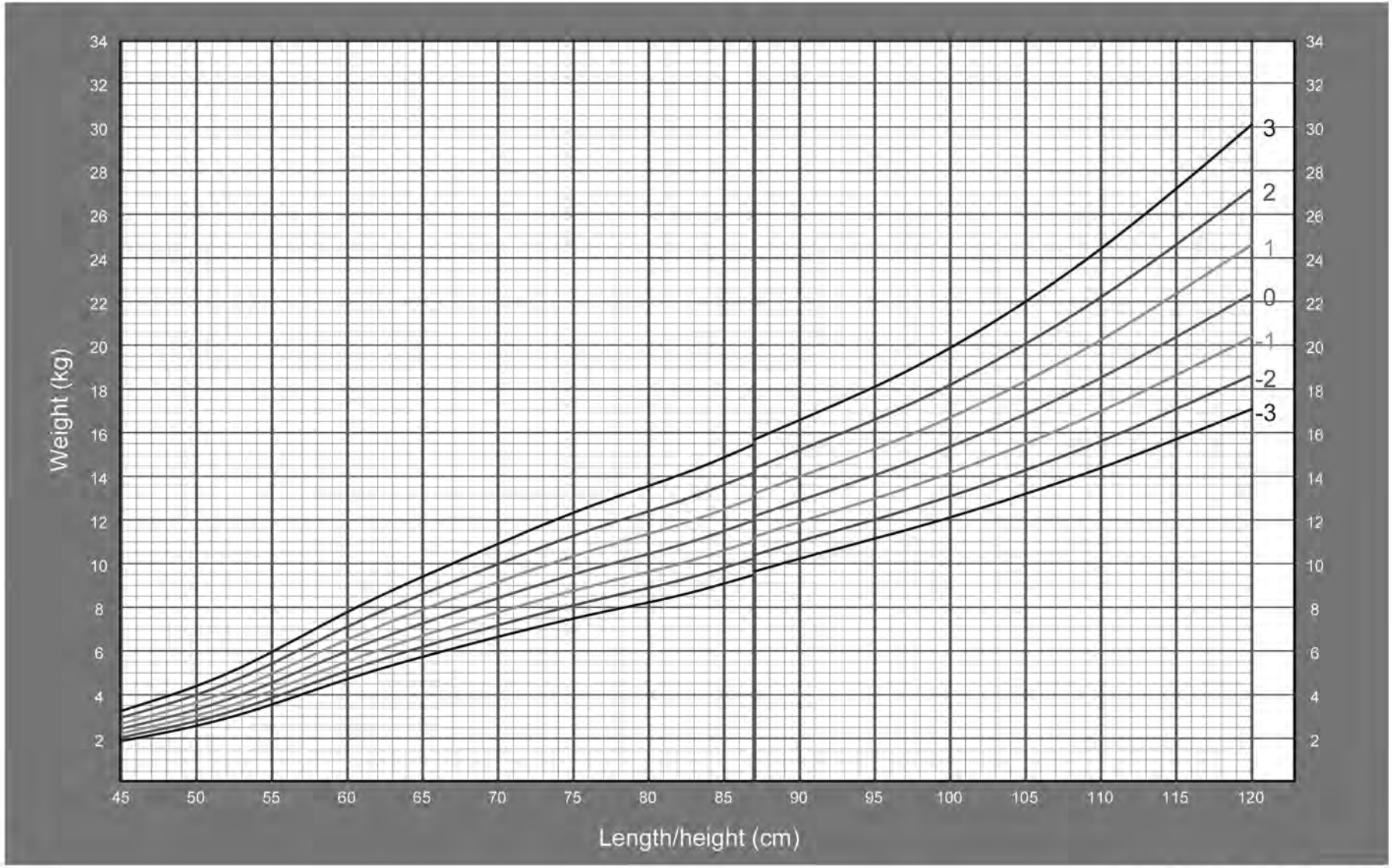


WHO Child Growth Standards

Appendix 18. Weight-for-length/height BOYS

World Health Organization

Birth to 5 years (z-scores)

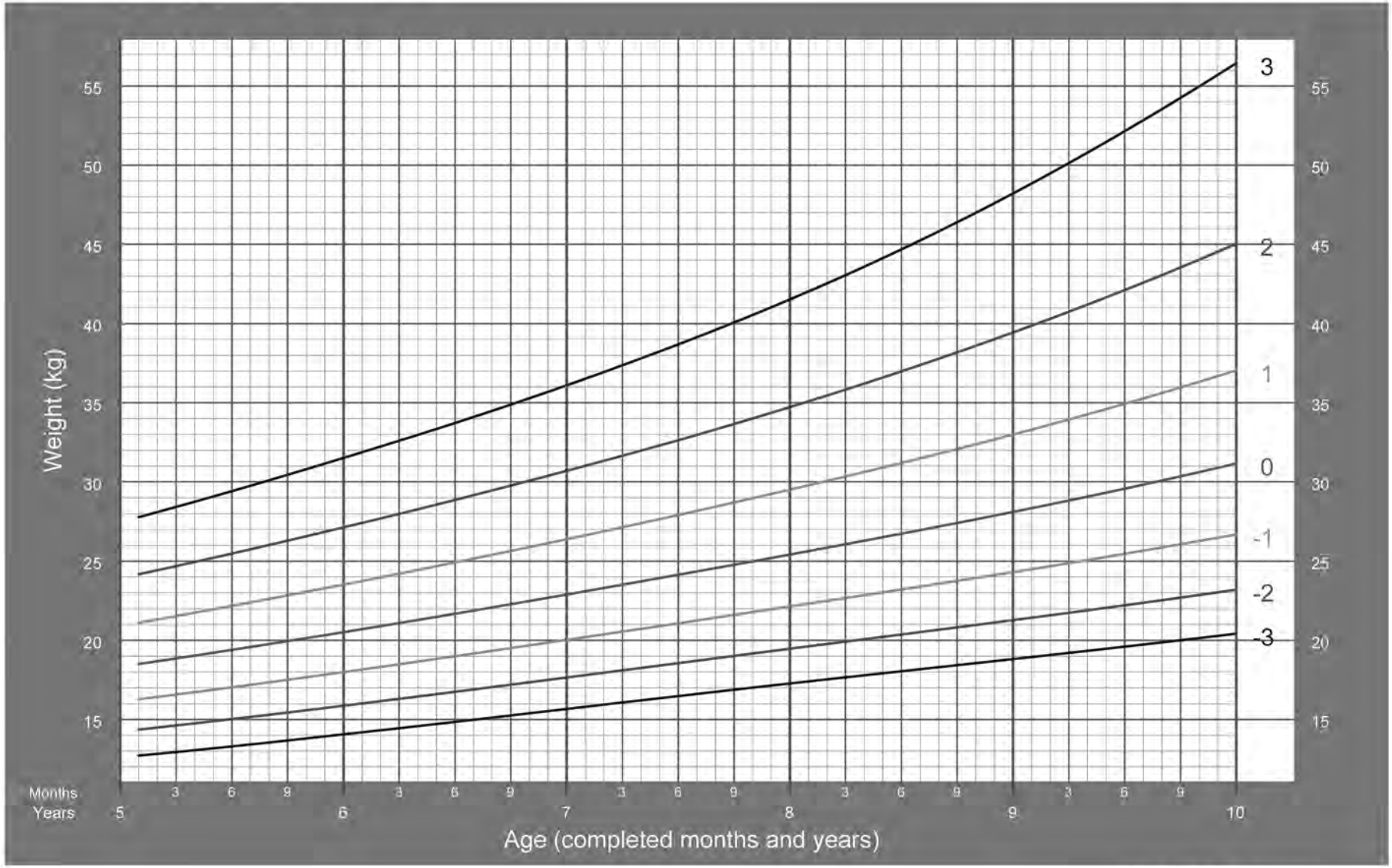


WHO Child Growth Standards

Appendix 18. Weight-for-age BOYS

5 to 10 years (z-scores)

World Health Organization

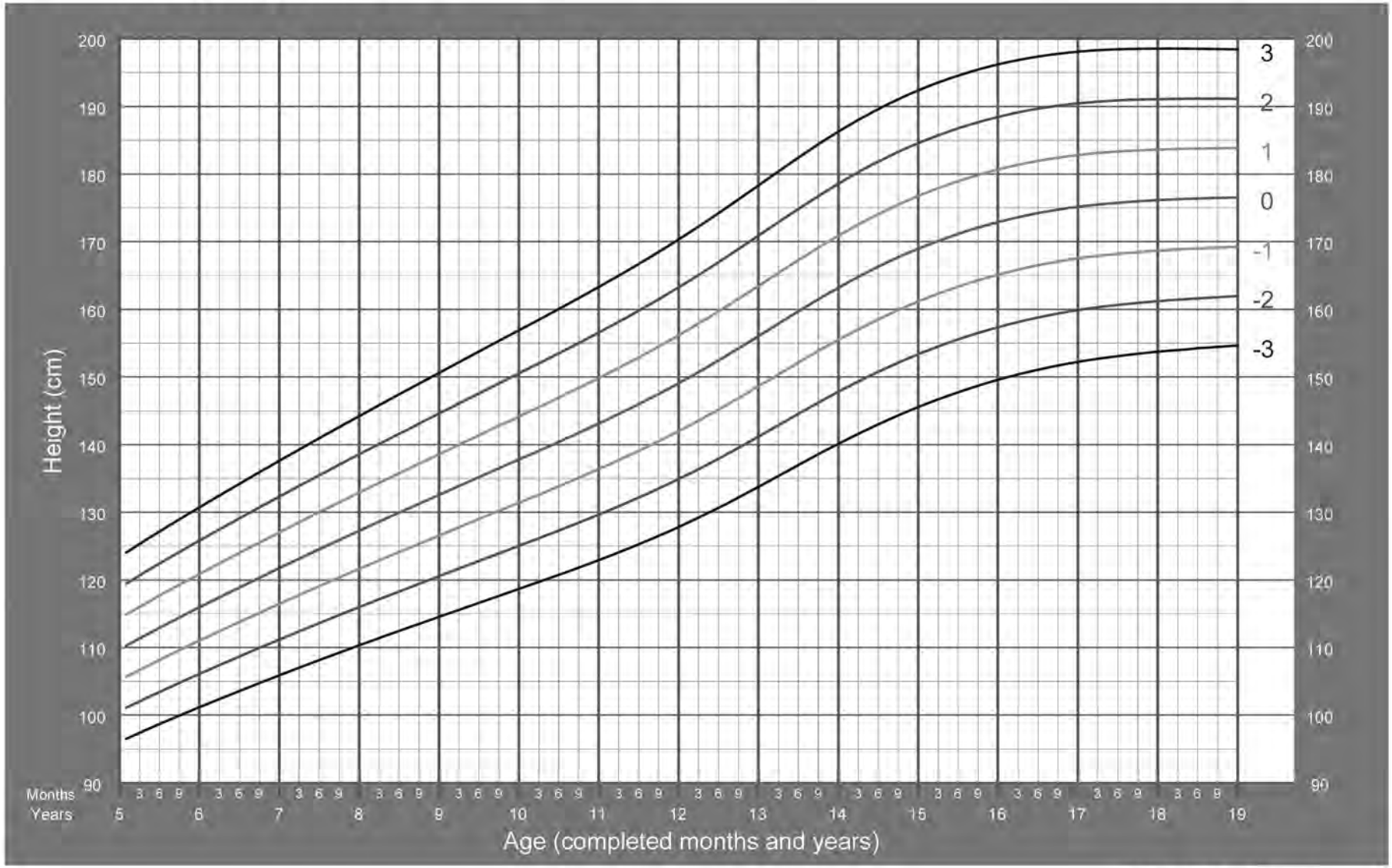


2007 WHO Reference

Appendix 18. Height-for-age BOYS

5 to 19 years (z-scores)

World Health Organization

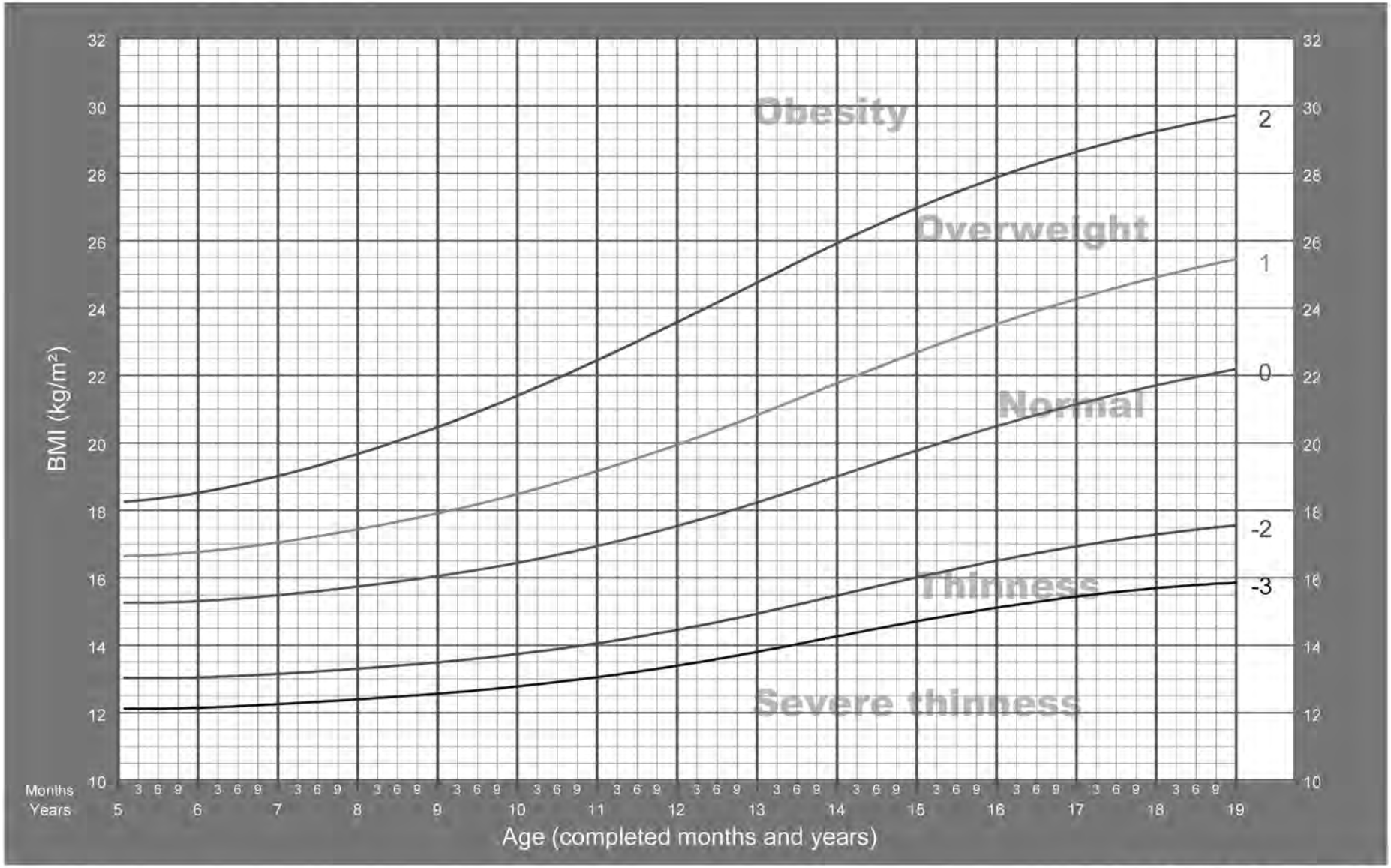


2007 WHO Reference

Appendix 18. BMI-for-age BOYS

5 to 19 years (z-scores)

World Health Organization

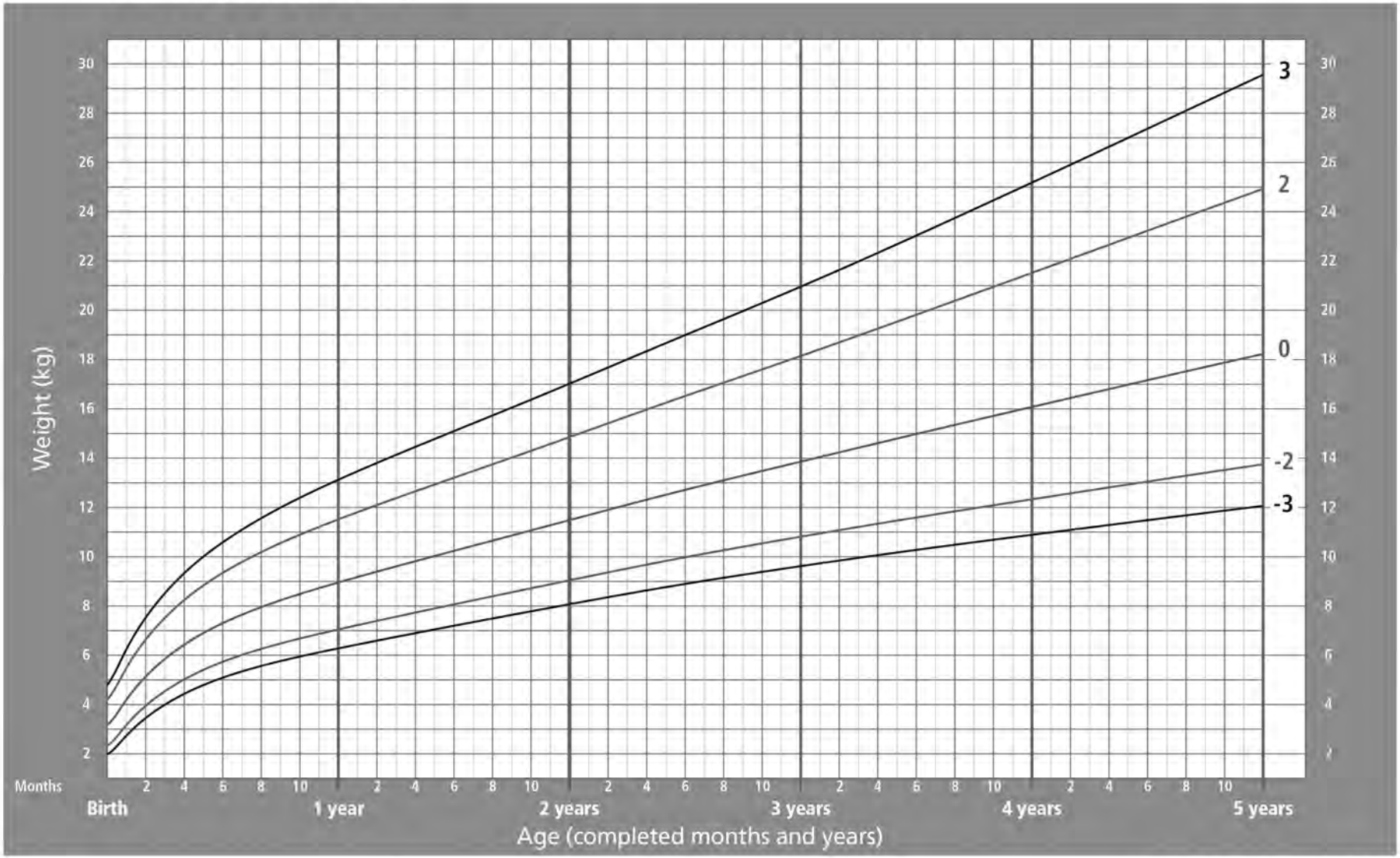


2007 WHO Reference

Appendix 18. Weight-for-age GIRLS

Birth to 5 years (z-scores)

World Health Organization

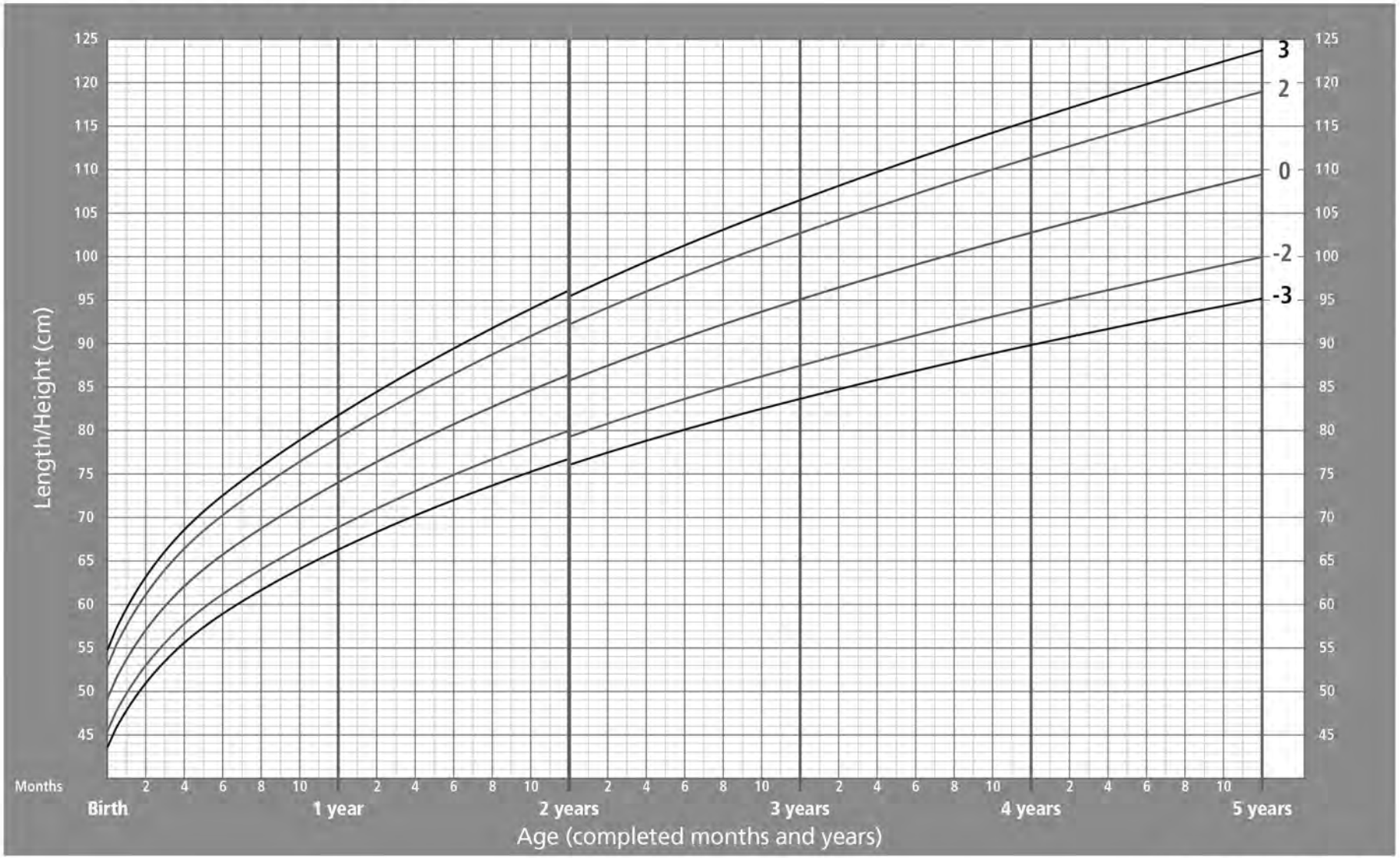


WHO Child Growth Standards

Appendix 18. Length/height-for-age GIRLS

Birth to 5 years (z-scores)

World Health Organization

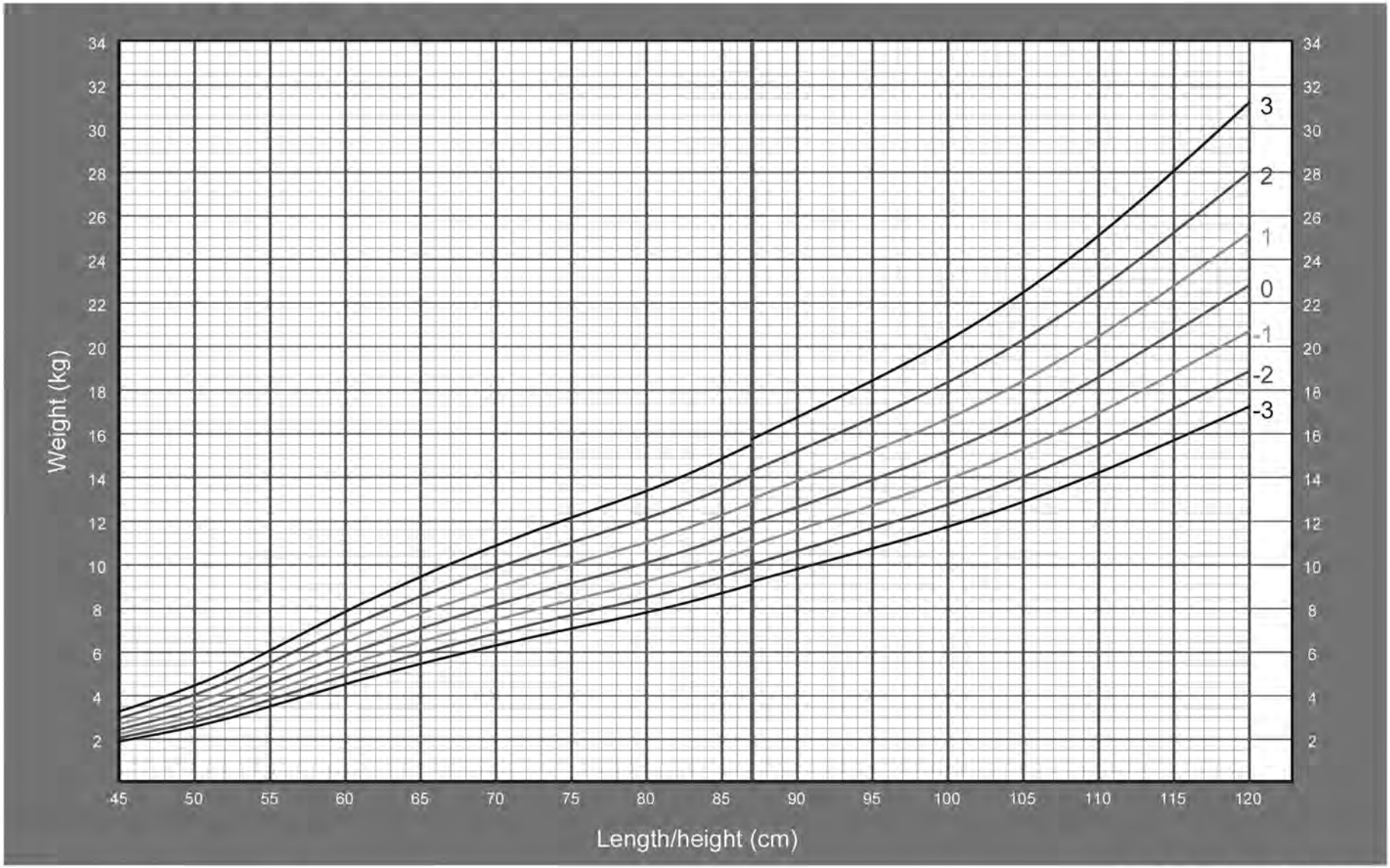


WHO Child Growth Standards

Appendix 18. Weight-for-length/height GIRLS

World Health Organization

Birth to 5 years (z-scores)

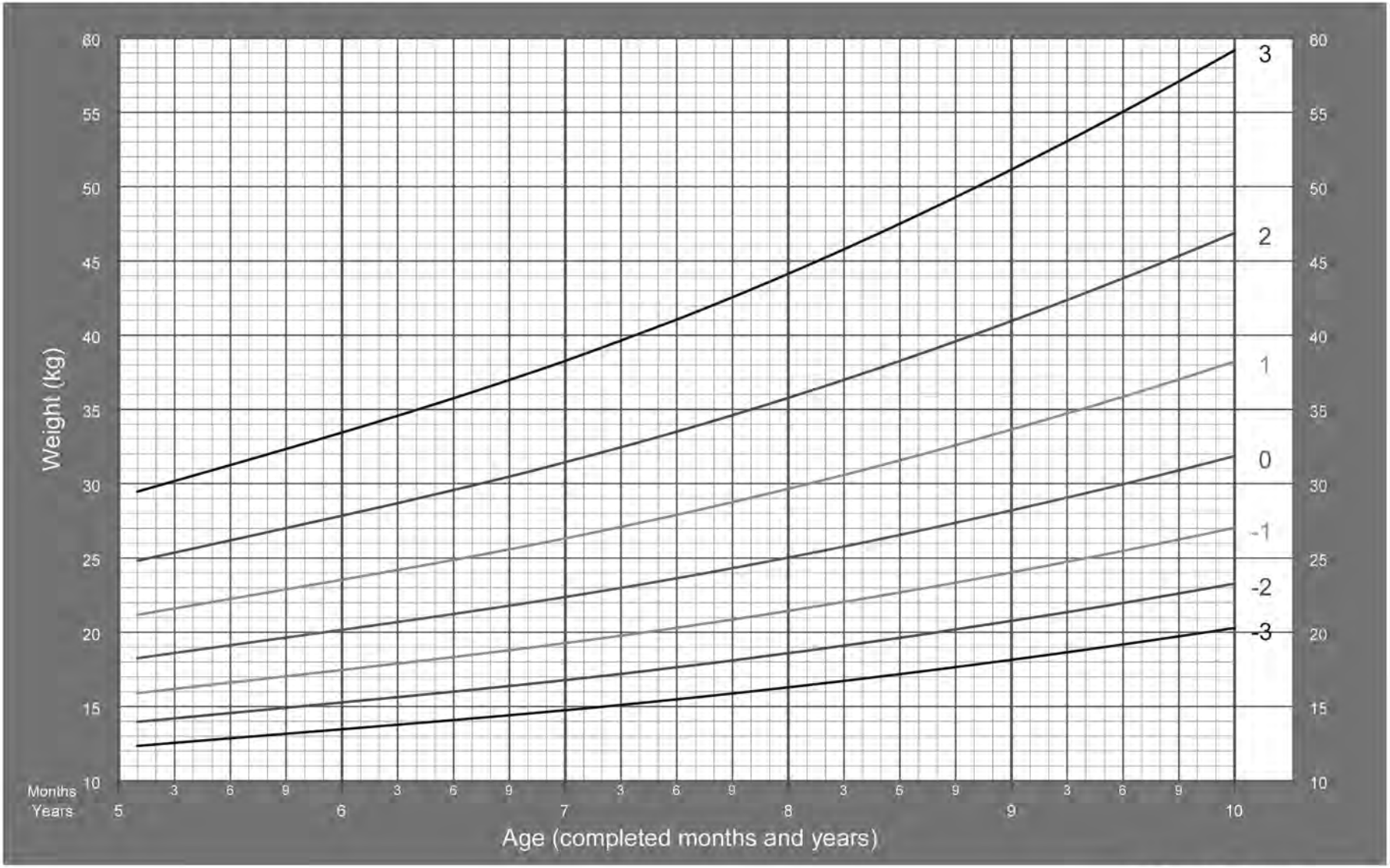


WHO Child Growth Standards

Appendix 18. Weight-for-age GIRLS

5 to 10 years (z-scores)

World Health Organization

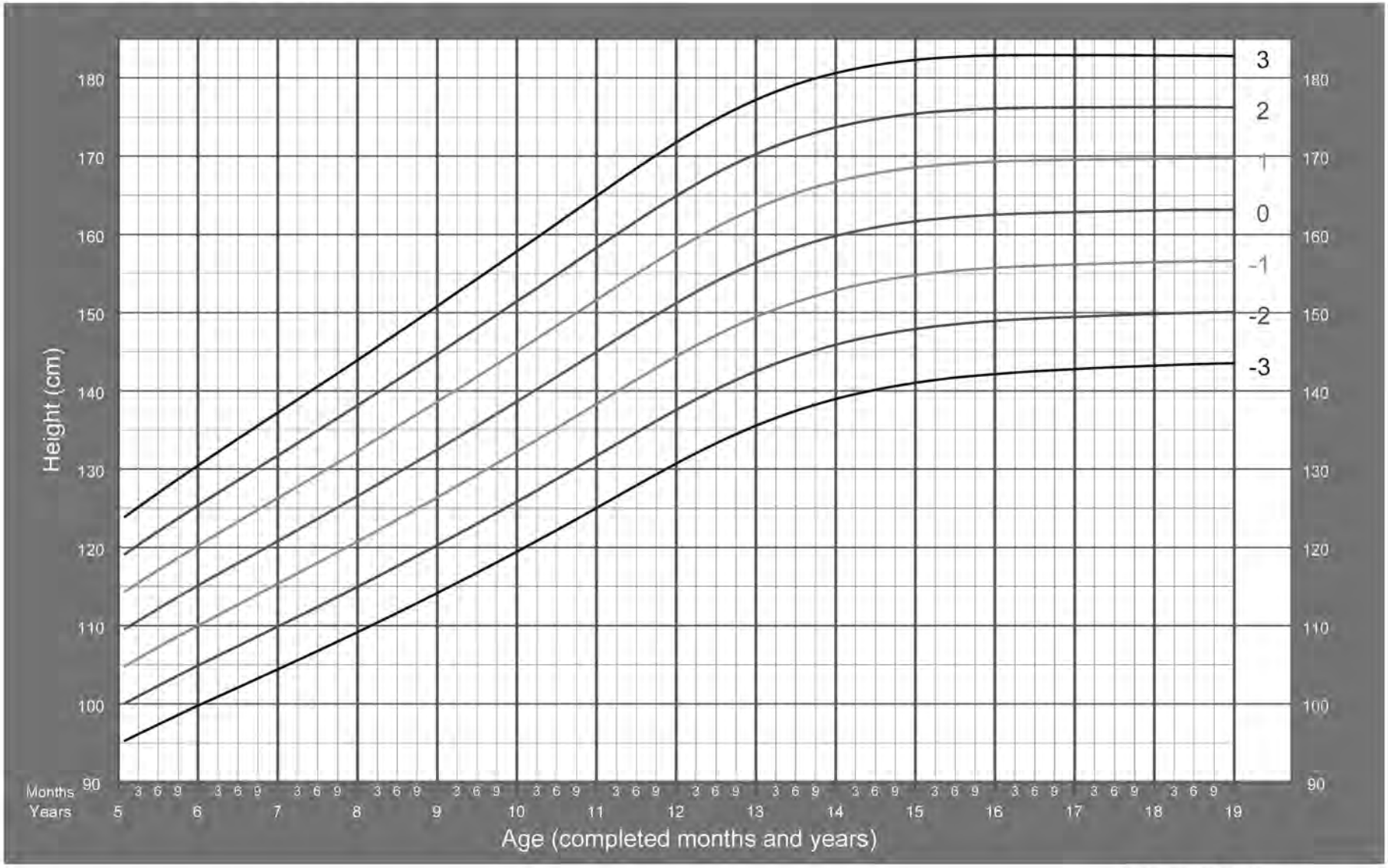


2007 WHO Reference

Appendix 18. Height-for-age GIRLS

5 to 19 years (z-scores)

World Health Organization

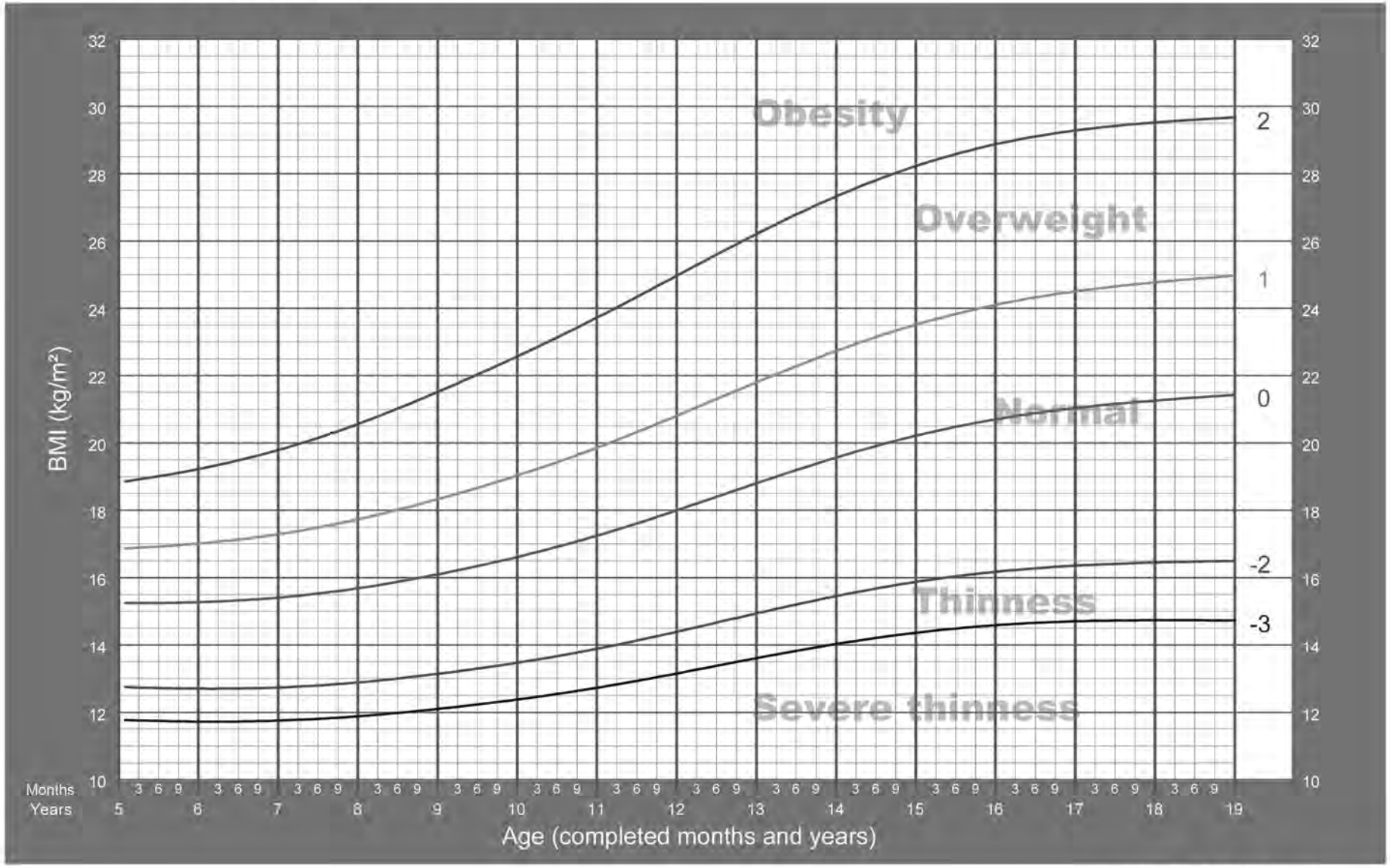


2007 WHO Reference

Appendix 18. BMI-for-age GIRLS

5 to 19 years (z-scores)

World Health Organization



2007 WHO Reference

Appendix 20. Oxygen weaning SOP

SOP title	Oxygen weaning-SOP-Clinical-V1
Version No.	V1
DATE OF ISSUE	30 October 2019 (has been in practical use since 2011)
ORIGINAL AUTHOR	Kathy Burgoine
REVIEWED BY	Htet Ko Ko Aung
AUTHORISED BY & DATE	Cindy Chu, 17 Mar 2020
LOCATION OF MASTER DOCUMENT	T:\Medical\Clinical SOPs

Document Review History

Version	Reviewed By & Date	Changes made	Date of Issue
1	C Chu, 30 Oct 2019 (update)	Weaning guidelines from 2011 were put into this SOP template	30 Oct 2019
1	HKKA 16 Mar 2020	A follow up review of the SOP resulted in no changes	17 Mar 2020

SOP TITLE
Process for weaning and stopping supplemental oxygen in the field clinics

PURPOSE AND SCOPE
This SOP covers how oxygen should be removed from patients who require supplemental oxygen during hospitalisation.

WHICH PATIENTS?
- Not neonate
- No COPD
- No congenital heart disease (especially cyanotic) – discuss with doctor
- No chronic hypoxia

EQUIPMENT *(see Figure 1 for oxygen delivery methods)*
- Non-rebreather mask
- Face mask
- Nasal cannula
- Connecting tubes
- Oxygen tank – check oxygen pressure

WEANING OXYGEN
Decrease oxygen when clinical condition better, RR improved, and oxygen saturations ≥ 95%. Decrease step by step and check saturation between each step:
- 5 litres with mask, THEN
- 4 litres with mask, THEN
- 3 litres with mask, THEN
- 2 litres with nasal cannula, THEN
- 1 litre with nasal cannula, THEN
- ½ litre with nasal cannula, THEN
- stop

NOTE: Oxygen weaning may depend on the individual patient, their disease, age, pregnancy status, and baseline oxygen saturation. The plan below is a general guide. If there is a different management plan, be sure that everyone on the clinical team (doctor, medic, nurse, health care worker and patient) is aware.

CHECK OXYGEN SATURATIONS

- Every 5 min x 3, THEN
- Every 15 min x 3, THEN
- Every 30 min x 2, THEN
- Every 1 hour x 2, THEN
- Routine vital signs (or follow treatment plan)

- *If oxygen saturations remain ≥ 94% at 60 minutes, continue to decrease oxygen or stop weaning. This depends on the treatment plan.*
- *If oxygen saturations drop <90% INCREASE the oxygen, check saturations, and when ≥94% stop weaning.*
- *If the patient becomes blue or oxygen saturations drop <90% at any time, restart oxygen*

COMMUNICATION

- A medic can make the decision to wean oxygen.
- The medic should include the oxygen weaning activities during medical rounds.
- All staff who are caring for the patient should be aware of the treatment plan.
- Complications are reported from the medic to the physician.

REFERENCES

BBG Guidelines, edition 2016
Obstetric Guidelines, edition 2018
Malaria Guidelines, edition 2018

Figure 1. Oxygen delivery methods

Fi02 and delivery device

Device	Reservoir capacity	O2 flow (L)	Approximate Fi02
Nasal Cannula	50 ml	1	0.21-0.24
		2	0.24-0.28
		3	0.28-0.34
		4	0.34-0.38
		5	0.38-0.42
		6	0.42-0.46
Oxygen face mask	150-250 ml	5 to 10	0.40 - 0.46
Mask with reservoir bag	750-1250 ml		
Partial non-rebreather		5 to 7	0.35-0.75
Non-rebreather		5 to 10	0.40-1.0

SMRU.

SHOKLO MALARIA RESEARCH UNIT

Guideline for Prevention of Mother to Child Transmission

8th edition

APPENDICES

Preliminary Introduction

PMTCT activity at SMRU is based on teamwork between OB and TB/HIV departments and involves medical assessment, counselling and referral to Myanmar OG and NAP at Myawaddy hospital for sustainable ART to patients.

In case of emergency, SMRU team can start and support ART short term. As soon as possible after the emergency SMRU team needs to refer to Myanmar program for long-term treatment for mother and baby.

Contents

Glossary

ALT:	Alanine Aminotransferase
ANC:	Antenatal Care
AROM:	Artificial rupture of membranes
ART:	Antiretroviral Therapy
AST:	Aspartate Aminotransferase
AZT:	Zidovudine
CD4:	Cluster of Differentiation 4
EFV:	Efavirenz
EPI:	Expanded Program on Immunization
FTC	Emtricitabine
G6PD:	Glucose 6 Phosphate Deficiency
Hb:	Hemoglobin
HBs Ag:	Hepatitis B Antigen
HCV Ab:	Hepatitis C Antibody
Hct:	Hematocrit
HIV:	Human Immunodeficiency Virus
MCH:	Maternal and Child Health
NAP	National AIDS Program
NVP:	Nevirapine
OIs:	Opportunistic Infections
PMTCT:	Prevention of Mother to Child Transmission
RDT:	Rapid Diagnostic Test
TDF:	Tenofovir
TPHA:	Treponema pallidum Hemagglutination Assay
VDRL:	Venereal Disease Research Laboratory
3TC:	Lamivudine

APPENDICES

1) Prevention of Mother to Child Transmission (PMTCT)

a) PMTCT Counsellors at the ANC do Pre and Posttest counselling.

PMTCT : All pregnant women should be tested for HIV at first visit (OB guideline),

Screening test: If a woman has a positive HIV screening test, counsellors should inform the OB doctor and prepare confirmation testing and close follow up (eg. 1 week). Please take extra care to get a reliable address/phone number or other contact information for any patients with a positive HIV screening test to help with safe follow-up.

Confirmation test: If confirmation test is positive for HIV, the counsellor who is doing the counselling should inform both OB Doctor, TB Doctor and Midwife team. TB/HIV doctors will plan to see the patient for TB and OIs screening .

HIV diagnosis should be in the file of patient so medics, midwives, nurses and doctors can know about it when they take care of the patient.

2) First visit – after diagnosis of HIV/before delivery, done by SMRU Doctor and preparation of ART plan

- History taking and Physical examination for CLINICAL STAGING (See BBG p.120-121)
- Check for PREVIOUS ART EXPOSURE
- Assessment and treatment for OIs including TB (See Appendix 2)
- initiate COTRIMOXAZOLE PRIMARY PROPHYLAXIS 960mg OD (for WHO stage I and II with CD4 <350, stage III and IV regardless of CD4)
- based on first visit, Doctor decides if need to do BASELINE INVESTIGATIONS (Doctor prescription)
    - CD4
    - CBC, CRP
    - ALT, AST, Total bilirubin, creatinine, Phosphorous, BUN
    - HBs Ag, Anti-HCV, RPR and TPIC (if not recently done in ANC)
    - G6PD test
    - Serum Cryptococcus Ag – if CD4<100
    - TB screening with TB screening questionnaires and tests if needed (sputum tests include GeneXpert, and CXR).
- ART plan: the counsellor and doctors should plan with the woman the best way to get her ART:
    - First Choice: To refer to Myawaddy NAP to initiate ART (challenging in organization but more sustainable for women),
    - In Emergency: To follow up at SMRU clinic for ART (if challenge to start ART at Myawaddy BUT not sustainable option for woman long-term)
    - For MSL women, we may consider Hlaingbwe referral
- Referral plan if Referral to Myawaddy:

- The ANC Counselor informs to Myawaddy SMRU liaison officer for referral to MWDY NAP and OG.
- The doctor fills the standardized required Forms:
  - SMRU developed PMTCT form
  - Cross-Border referral form for referral to MWDY
- If there is an unusual situation, SMRU Doctor should contact with the Dr in charge at Myawaddy NAP.
- SMRU referral ANC staff at Myawaddy will organize and communicate for appointment date.

3) Emergency situation

A positive screening test in a patient close to delivery is an emergency. If the patient is close to delivery – medic/counselor should inform to OB doctor urgently. OB doctor will contact to TB/HIV doctor **and ART will be started as soon as possible (try to start before delivery).**

If there is a medical emergency situation for a PMTCT patient and you need to refer to Myawaddy hospital, the Doctor requests to be informed about the case before you send.

4) Treatment regimen

Although woman will be followed at Myawaddy, ART plan should be known from ANC team including all counsellors.

When to start ART in pregnant woman

ART should be initiated in all pregnant and breast-feeding women living with HIV:

As soon as diagnosed - Any WHO clinical stage - At any CD4 cell count

ART should be continued lifelong.

Starting ART is urgent if EGA is >20 weeks: do as quickly as possible.

First Line Treatment regime for pregnant women and breastfeeding mothers

Preferred Regimen	**TDF + 3TC (or FTC) + EFV**	AZT = Zidovudine (NRTI) 3TC = Lamivudine (NRTI) EFV = Efavirenz (NNRTI) TDF = Tenofovir (NRTI) NVP = Nevirapine (NNRTI) FTC = Emtricitabine (NRTI)
Alternative (If preferred regimen is not tolerated)	AZT + 3TC + EFV or NVP OR TDF + 3TC (or FTC) + NVP	

Anemia is a side effect of AZT. If woman are followed at Myawaddy, the side effect monitoring will be done by Myawaddy, but ANC should be aware of potential side effects

- Check for clinical signs and symptoms of anemia at every visit during the first 12 weeks.
- Laboratory monitoring (Hb/HCT): at baseline, 4 wks and 12 wks.
- If Hb < 8 g/dl (Hct – 25%) at baseline or during monitoring, choose/switch to alternative regime and investigate/treat anemia

5) Delivery

The delivery plan for women who are getting ART at Myawaddy should be delivery at Myawaddy to make sure the baby can get into care and receive ART as well.

In case of emergency delivery at SMRU ANC, all OB team including Doctor and Midwife should be informed, know about PMTCT guideline and PMTCT Box to give adequate treatment at admission and after delivery.

- As with all patients:
  - use universal precautions (Gloves, gowns, masks, eye protection)
  - clean all blood spills with virkon or chlorine solution (if virkon not available)
  - Remind patient and family to clean up blood clots or splashes in bathroom or halls
- Vaginal delivery is preferred for patients on antiretrovirals at least 4 weeks. Less than 4 weeks may still have high viral load.
- Arrange for ANC booking Myawaddy Hospital. SMRU should help plan with the woman to help her get there safely. She may need to wait at the patient house in Myawaddy ahead of time.
- If late to start ART (<4 weeks before delivery) C/S BEFORE LABOR may reduce the risk of transmission to the baby.
  - If the woman already has active labor or ruptured membranes – there is no benefit to C/S. Do not risk delivery on the way by transferring at this point.
- **In labor:**
  - only use invasive procedures (AROM, Vacuum, episiotomy) if needed for safe delivery (document the reason)
  - In a 2nd stage with intact membranes, controlled AROM can be considered to decrease risk of amniotic fluid splash to MW face.
- There is no data on risk or benefit of membrane sweeping – likely safe in patients with at least 2- 4 weeks ART
- **Postpartum**
  - controlling blood loss is a priority for patient and staff safety
  - Some HIV and TB medications interact with methergyn and could cause increased side effects **or** decreased effectiveness – use Synto, Misoprostol and Tranexamic acid first

- Clean blood and amniotic fluid off the baby – **make sure to carefully wipe skin with alcohol wipe before Hep B vaccine or Vitamin K injection.** Bathe infant in warm water with soap after birth to decrease risk of healthcare worker exposure.

6) Other related Actions

a) Family planning & couple counselling

- When a woman is HIV positive, a counsellor should give couple counselling (with support/supervision from counsellor supervisor) and offer partner testing. If HIV positive, TB screening should be done for the partner by TB doctor. If no TB is diagnosed, he should be advised to go to Myawaddy NAP for further care and TB team can facilitate for MWD appointment

- Family planning is very important for HIV positive women. Help the woman choose an appropriate method of family planning. Try to include her partner in the discussions. Check the family planning method and compliance at each visit.

For women who want another baby, it is best to delay the next pregnancy until:

- 6-12 months on ART so viral load is undetectable
- Inter-pregnancy interval of at least 2-3 years
- Taking folic acid 3 months before conception

If the next pregnancy would be high risk eg: on ART <6-12 months, less than 2 years since last delivery:

- Long-acting, reversible methods of contraception are recommended (e.g. IUD or implant)
- Note: EFV decreases implant hormone levels, increasing contraceptive failure somewhat, **but implant remains one of the most effective methods even with EFV**
- Depo-provera is an option, but the schedule for injections should be clear; irregular use increases the failure rate (3 monthly injections are hard to remember).

If Family is complete:

- Tubal ligation (sterilization) may be offered if available, with willing informed consent of the woman and consideration of her partner's wishes, and influence.
- Make sure that the woman does not feel forced/pressured to have a sterilization. HIV infection alone is not an indication for sterilization. Women with HIV are able to become pregnant and deliver healthy HIV-negative children.

b) Infant prophylaxis

Will also be given by Myawaddy NAP, but need to keep PMTCT box in case of emergency and unplanned delivery at SMRU.

Simplified infant prophylaxis dosing recommendation –

AZT (twice daily) and NVP (once daily) **for 6 weeks** regardless of breast-fed or formula-fed

Check the baby haematocrit and give the first dose as soon as possible after birth.

Infant age	Daily dosing of NVP	Daily dosing of AZT
Birth to 6 weeks		
• Birth wt 2000-2499 g[a]	10mg once daily (1ml of syrup once daily)	10mg twice daily (1ml of syrup twice daily)
• Birth wt>2500 g	15mg once daily (1.5ml of syrup once daily)	15mg twice daily (1.5ml of syrup twice daily)
>6 weeks to 12 weeks[b]		
	20 mg once daily (2 ml of syrup once daily or half a 50 mg tablet once daily)	No dose established for prophylaxis; use treatment dose 60 mg twice daily or 6 ml of syrup twice daily or a 60 mg tablet twice daily

[a] For infants weighing <2000 g and older than 35 weeks of gestational age, the suggested doses are: NVP 2 mg/kg per dose once daily and AZT 4 mg/kg per dose twice daily. Premature infants younger than 35 weeks of gestational age should be dosed using expert guidance.

[b] Prophylaxis up to 12 weeks of age should be considered in special situations in which the infant is identified as HIV exposed after birth and is breastfeeding.

c) Infant follow up

The child should be seen ASAP after delivery, 2 weeks, 4 weeks and 6 weeks of age. Follow up should continue to 18 months.

Each visit should include

-Nutrition growth monitoring (Breastfeeding, weaning, complementary food)

-Developmental assessment

-Physical examination for AZT /Nevirapine side effects and presumptive signs and symptoms of HIV infection

-Hematocrit (Hct) testing at birth, 2, 4 and 6 weeks or if clinically indicated.

-Prevent anaemia: prophylaxis ½ folic acid tablet per week and ferrous sulphate syrup 0.3 ml once daily

-Treat anaemia: folic acid ½ tablet once daily, ferrous sulphate syrup 0.6 ml three times daily

-Follow the general recommendation of SMRU paediatric guideline if anemia develops.

d) Infant feeding options

Encourage breast feeding in all HIV positive mothers.

Mixed feeding (breastfeeding and bottle feeding together) it increases the risk of childhood infections and the risk of HIV transmission.

To avoid stress and confusion for the woman, always ask her what she has been told about feeding, and by whom (eg. SMRU staff, MWDY staff, Thai hospital staff). Ask about what feeding method she wants. Use this information when giving counselling for breast feeding.
Example counselling: "You were told by XXX that it is dangerous to breast feed your baby. That used to be our policy too, but we now know that it is safer for most women with HIV to breast feed than to bottle feed their babies. If you keep taking the medicine regularly you are unlikely to give your baby the virus by breastfeeding, and your breastmilk will protect her from other infections. Powder milk is expensive and can be dangerous if not prepared correctly. Which do you want to do?"

-At Myawaddy Hospital (according to national guidelines), if ART started under NAP in early pregnancy, and good adherence, Woman can have Normal delivery and can breastfeed.
-If late stage of pregnancy and poor adherence, they will do caesarean section and recommend bottle feeding

For breastfeeding mothers

- Within one hour of delivery: check for correct latching (enough areola in the mouth) to prevent cracked and sore nipples.
- Mother to check the baby's mouth regularly for sores.
- Assess mother's nutritional status. Check BMI. Give diet counselling or Asia Mix if necessary.
- No bottles, teats or pacifiers.

Exclusive breastfeeding during the first 6 months of life means that the baby gets only breast milk (no formula, tea, water, cereal, traditional medicines), oral polio vaccine and cotrimoxazole prophylaxis. Medications prescribed at the health centre or hospital to treat inter-current medical problems are also allowed.

Exclusive formula feeding means baby gets only formula (no breast milks). Before 6 months of age, the infant does not need any food other than milk to grow.

After 6 months, complementary foods are necessary for the infant's growth and should be introduced even though the breastfeeding **or** formula mother is continued.

For some exceptional cases formula milk is an acceptable alternative to breast milk.

Conditions needed to safely formula feed [1]

a) Safe water and sanitation are assured at the household level and in the community, **and,**
b) The mother, or other caregiver can reliably provide sufficient infant formula milk to support normal growth and development of the infant, **and,**
c) The mother or caregiver can prepare it cleanly and frequently enough so that it is safe and carries a low risk of diarrhoea and malnutrition, **and,**
d) The mother or caregiver can, in the first six months, exclusively give infant formula milk, **and,**

e) The family is supportive of this practice, **and,**
f) The mother or caregiver can access health care that offers comprehensive child health services

Weaning (eg. stopping breast milk) is recommended at 12 months. Weaning does not have to be fast. Remember that the baby is still protected via the mother's ART (assuming that the HIV viral load is very low). If another source of milk is not available, breastfeeding can be continued. If the baby tests positive for HIV, breastfeeding can continue for up to two years and beyond.

e) Vaccination

Vaccination of HIV exposed infants should be given as usual. BCG and Measles should be avoided in symptomatic infants.

f) Cotrimoxazole prophylaxis

Cotrimoxazole must be started at six weeks of age (even if PCR is not available or negative) and continued until HIV infection is excluded. If tested HIV negative 6 weeks after stopping of breast feeding, cotrimoxazole prophylaxis can be stopped.

Cotrimoxazole prophylaxis dosing table

Strength of liquid (mg/5 ml)or oral tab	3-5.9 kg	6-9.9 kg	10-13.9 kg	14-19.9 kg	20- 24.9 kg	25-34.9 kg
Suspension 200/40mg per 5 ml	2.5ml	5ml	5ml	10ml	10ml	-
Tablet 400/80mg	-	0.5	0.5	1	1	2

g) HIV testing for the infant: PCR, and HIV antibody (Not compulsory, based on the project availability, and Myawaddy FUP)

All infants should be offered a viral PCR test at 6 weeks after birth to ascertain HIV infection during pregnancy and birth. This can be done at the same visit when the patient starts cotrimoxazole prophylaxis. The reason is to diagnose HIV earlier in infants and start ART as early as possible.

If PCR not done by MWDY or SMRU, the baby should be followed closely for any clinical signs of HIV or AIDS. ARV prophylaxis **can be stopped** at 6 weeks in asymptomatic babies even if they were not tested, but cotrimoxazole **should be given**.

Rapid diagnostic tests for HIV testing can be used at **one year of age and/or 6 weeks after stopping breast feeding** to rule out HIV infection in asymptomatic HIV exposed infants.

All children must have their final HIV status confirmed at **18-months** of age with rapid diagnostic HIV testing (HIV RDT testing).

PMTCT Box

PMCT box should be kept in delivery room at all times.

Contents:

- PMTCT flow chart
- Baby ART:
  - Nevirapine syrup – 1 bottle
  - Zidovudine syrup – 1 bottle
- Mother ART:
  - TDF, 3TC and Efavirenz 600 mg (as combination or separate) 7 doses
    OR
  - AZT+3TC and Efavirenz 600 mg (as combination or separate) 7 doses

Midwife team must check and update the box monthly to make sure that all medicines are in good expiration dates.

If you use any medicine in the box, contact the pharmacy as soon as possible to restock.

References:

1. GUIDELINES FOR THE CLINICAL MANAGEMENT OF HIV INFECTION IN MYANMAR-Fifth EDITION, 2017

2. Management of PMTCT and Infant Feeding in MSF-H, October 2011

3. MSF HIV/TB guideline, 2015

4. Consolidated guidelines on the use of Antiretroviral drugs for treating and preventing HIV infection, recommendations for public health approach, second edition, 2016

5. Consolidated guidelines on the use of Antiretroviral drugs for treating and preventing HIV infection, June 2013

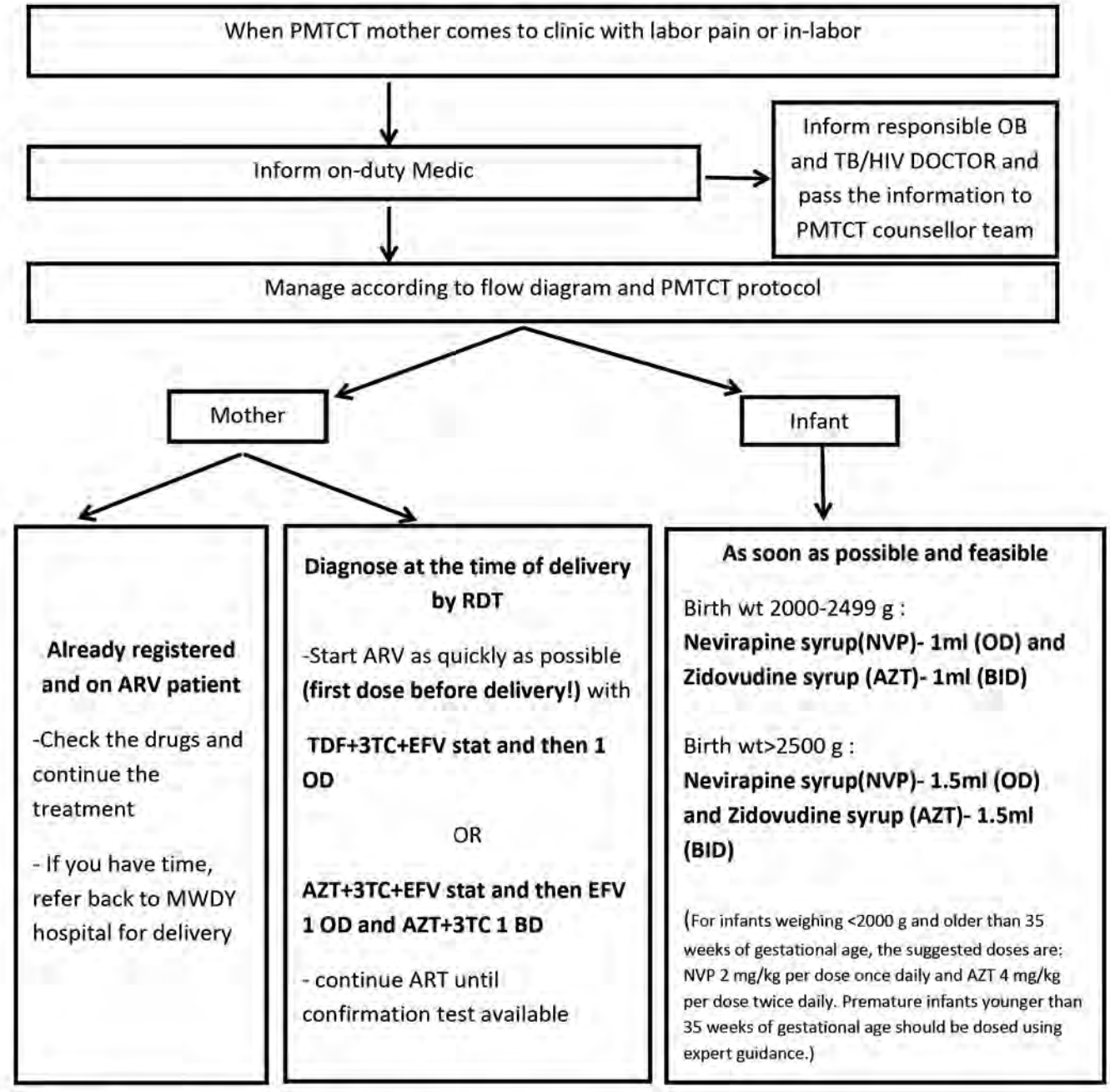
6. Consolidated guidelines on the use of Antiretroviral drugs for treating and preventing HIV infection, November 2015

7. Field guideline of HIV treatment for Adults and adolescents and Prevention of Mother to Child Transmission, June 2011

8. Labor and delivery management of women with human immunodeficiency virus infection. ACOG Committee Opinion No. 751. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;132:e131–37.

APPENDICES

Appendix 1 : FLOW CHART FOR PMTCT INTERVENTION DURING DELIVERY



NOTE – senior midwives can calculate and give the medicines to both mother and infant in case of emergency condition but it is necessary to make a confirmation and double check with on-duty Medic.

-Vaccinate all infants according to EPI schedule. BCG and Measles vaccines are contraindicated in symptomatic and severe immunocompromised HIV infected ones.

Appendix 2: TB Active Case Detection Form

Personal data

Name:|_____|Age:| D.O.B |_____| |__|Male |__| female Ethnic |__|Bur |__|Karen

Address:|_____| If Patient is <15 year: Parent Name: |_____|(Father) |_____|(Mother)

Phone No:||_____|ACD Type |___| Contact |__| Healthcare Worker |__|Special case |__|Other_____

Screening Questionnaire

A. TB Suspected symptoms တီဘီရောဂါလက္ခဏာများ	No	Yes
1. Cough any duration **ချောင်းဆိုးနေခြင်း**	☐	☐
2. Cough with blood (within last 12 months) **ချောင်းဆိုးလျှင်သွေးပါခြင်း(တနှစ်အတွင်း)**	☐	☐
3. Persistent fever > 2 weeks **ပါတ်ထက်ပိုပြီးဖျားနေခြင်း**	☐	☐
4. Weight loss (last 3 months) **ကိုယ်အလေးချိန်ကျခြင်း(၃လအတွင်း)**	☐	☐
5. Night sweat **ညဖက်ချွေးထွက်ခြင်း**	☐	☐

If "Yes" to any of above questions, send for diagnosis. အထက်ပါလက္ခဏာတစ်ခုခုရှိလျှင်ရောဂါစစ်ဆေးရန်လွှဲပါ။

B. TB Contact Case

☐ No, မရှိပါ

☐ Yes, send to TB clinic. ရှိလျှင်တီဘီဆေးခန်းသို့ လွှဲပါ

တီဘီရောဂါသည်နှင့်ထိတွေ့မှုရှိခြင်း

Name of the Source Case ..... Relation .....

လူနာအမည် တော်စပ်ပုံ

Type of TB: ..... TB registry number .....

တီဘီရောဂါအမျိုးအစား တီဘီလူနာနံပါတ်

C. History of TB treatment

တီဘီဆေးကုသမှုရာဇဝင်

☐ No previous TB treatment
တီဘီဆေးကုသမှုခံယူဖူးပါ

☐ Yes, send to TB clinic
တီဘီဆေးကုသမှုခံယူဖူးသည် (တီဘီဆေးခန်းသို့ လွှဲရန်)

When ဘယ်တုန်းက	Where ဘယ်မှာ	Type of TB တီဘီရောဂါအမျိုးအစား	Duration ကုသမှုကြာချိန်	Outcome ကုသမှုရလဒ်

Referred to Medic / Doctor for further diagnostic services

Medic/ဆရာဝန်ထံသို့ ရှေ့ဆက်စစ်ဆေးရန်လွှဲပြောင်းပေးခြင်း

☐ **No** မရှိပါ ☐ **Yes** လွှဲပြောင်းပေးသည်

Interviewer: ..... *Date:* .....

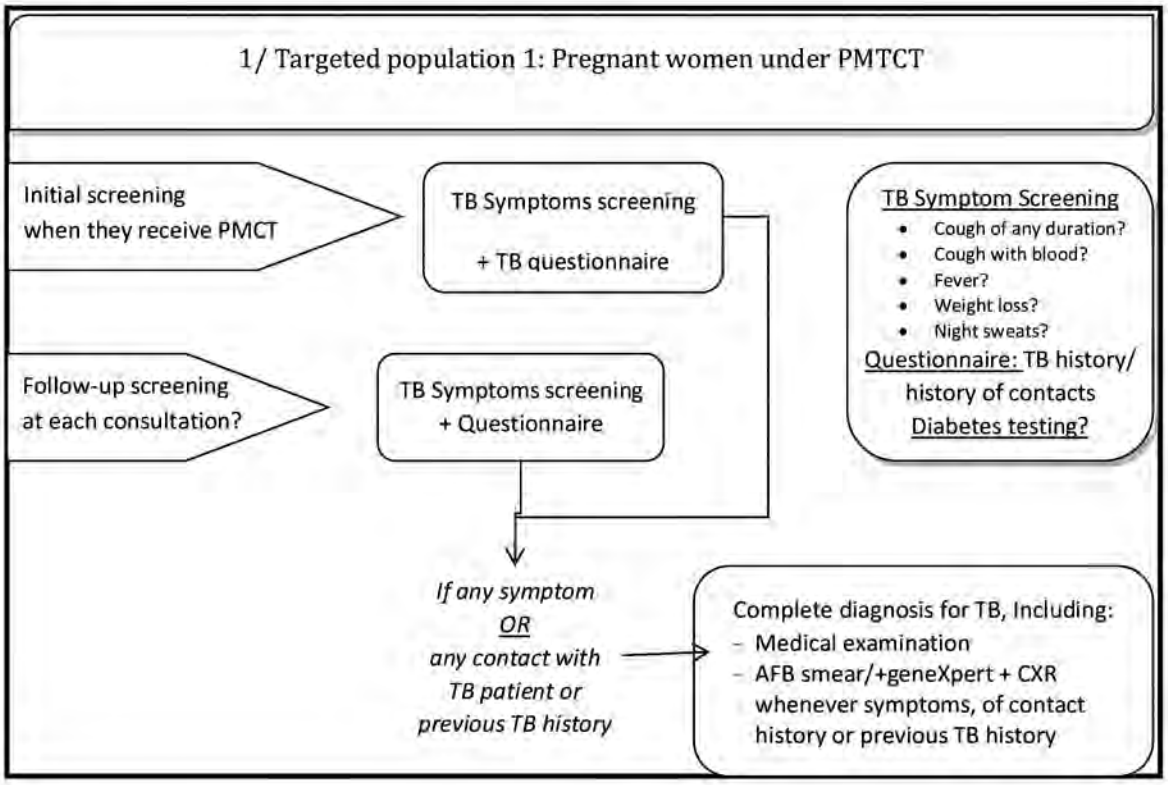
မေးမြန်းသူအမည် နေ့စွဲ

FT-07: Version:1.1.2014

APPENDICES

Tuberculosis Screening in PMTCT

Screening algorithm for ALL infected pregnant women who receive PMTCT: use at initial screening and at all follow up consultation with TB screening questionnaire.



If attending ANC OPD, any coughing patient should be asked to wait in a separate area and wear a mask. If you suspect TB, wear an N95 mask when seeing the patient and let other staff know you suspect TB so they can protect themselves.

- Screening for Active TB disease with bacteria called Mycobacterium tuberculosis
- Can spread to other people through aerosols (droplets of sputum in the air), more likely to spread if sputum is positive
- Screening PMTCT should look for symptoms and history of previous contact with TB patient or previous TB history
- Symptoms include cough (any duration), fever, coughing blood (hemoptysis), and weight loss (or in pregnancy, failure to gain weight), night sweats
- TB can infect many different organs (eg. kidney, brain): **think of TB** for any patient with prolonged fevers, prolonged cough, poor weight gain/weight loss, abnormal lung sounds, tired and depressed

Questions to ask when checking for TB risk:

- How long has the person had a cough? Any night sweats?
- Is the cough productive of sputum? Has the person lost weight?
- Has the person had treatment recently for pneumonia?

- Any close contact with TB? Is the person HIV positive?
- Has the patient already treated with TB
- Does the patient have diabetes?

If any of symptoms, or history of contacts or previous TB, complete questionnaire and get sputum sample. Ask patients to return for results and follow up.

Diagnosis:

- Discuss all suspect TB patients with OB doctor (or TB doctor if available). Any highly suspicious, complicated, or confirmed positive cases, OB doctor will discuss with/refer to TB doctor
- Do full physical exam: lymph nodes? Abnormal lung sounds? Very thin? Liver? Spleen?
- Use specific TB lab request form, and request two sputum samples from patients for sputum tests for AFB: one "spot" test the same day, one early morning sputum sample.
- For PMTCT, on lab request form for TB, always request geneXpert with sputum test
- Other tests that may be used, especially if PMTCT+ or strongly suspect TB but negative sputum: CXR, TST, other fluids for AFB (eg. urine, ascites, CSF, Lymph node aspirate), ultrasound (FASH scan)
- TB diagnosis needs to be confirmed by TB doctors and treatment initiated by them

Treatment:

- TB treatment will be started under responsibility of TB doctors and place for treatment will be case by case discussion.
- TB patients need to take long (6-24 month) courses of anti-TB antibiotics, and should be managed by staff familiar with TB. If you suspect TB contact the OB or TB doctor.

ANC:

- If sputum positive, arrange for ANC visit after the other women have gone home (eg. 14:00) to decrease risk to other patients
- High risk for anemia, IUGR, stillbirth, PTL
- Do US for growth and BPP/Doppler if FH is low or decreased FM
- Coordinate with TB team – if they already did CBC/HCT this week, no need to repeat.

Delivery:

- If Pulmonary TB (sputum positive or negative):
    - All staff need to wear N95 mask at delivery. Avoid air conditioner in high risk of transmission situations.
    - Keep woman away from other patients (discuss with TB team/OB doctor if there is difficulty providing safe delivery for the TB patient or other patients because of space)
    - Clean floor and walls of delivery with chlorine solution after delivery
    - Discuss with TB team: baby may need INH prophylaxis for 3-6 months
    - Breastfeeding usually encouraged (discuss with TB team if mother severely unwell, drug resistant TB etc.), but mother should wear a mask, and stay separate from baby when not breastfeeding until she is sputum negative.
    - If need to separate mother and baby, try to print a picture of the baby for the mother to have, and organize every day meeting with infection control measure.

INDEX

MAE TAO CLINIC

Medication handbook – MTC version 2020

Introduction to the handbook

- ✓ This medication handbook was developed in August 2014, to help improve patient management at MTC. The handbook was updated in June 2020, at this time the WHO classifications were removed and the drugs were arranged alphabetically.
- ✓ MTC and the authors are not responsible for any consequence resulting from the application of the information in this document. Readers should always check the most up to date information.
- ✓ Some information had been chosen because of its relevance for MTC's specific setting & constraints.
- ✓ If you have any comments or suggestions, you are welcome to contact MTC to share them.
- ✓ The process of the writing of this handbook has been the following:
  - Reviewing WHO essential drug list 2013, from the perspective of MTC's situation
  - Selecting drugs to include; drugs available at the clinic, or drugs that are relevant for the health worker to have information about
  - Adapting information from MSF essential drug 2013 guidelines
- ✓ Each medication in the handbook is categorized into one of the following groups

	Category	Availability	Description
E	Essential drug at MTC	Available at the clinic	Commonly use at the MTC, according to protocols
C	Controlled drug	Available at the clinic	Controlled in MTC +/- in Thailand
S	Special drug	Available at the clinic +/- need to order when need	Use case by case with supervisor approval
i	Information	Not available at the clinic +/- Partner supply some of those drug	On WHO/MSF essential drug list
*	Other	Available at the clinic	Not on WHO/MSF essential list

- ✓ The following information is given for each medication:
  - Indication
  - Dosage:
    - Tab includes any form of oral (except syrup): tablet, capsule....
    - Length of treatment (how many days) depends on the indication
  - Contraindication
  - Side-effects: only more common side-effects are listed.
    - GI disturbance: Many drugs can give diarrhoea, nausea and vomiting.
  - Interaction: When you give two or more drugs at the same time, the action of the drugs may change.
  - Remarks if appropriate;
    - If kidney and/or liver functions are not good, be careful when prescribing a full dose of the majority of drugs.
  - Use during pregnancy and breastfeeding: Always be careful when you prescribe for a pregnant woman.

Abbreviations used

PO	oral	**mcg**	microgram
IM	intramuscular	**mg**	milligram
IV	intravenous	**g**	gram
SC	subcutaneous	**kg**	kilogram
PR	per rectum	**IU**	International Units
PV	per vagina	**Max**	Maximum
BID	2 times/day = every 12 hours	**Start**	Starting
TID	3 times/day = every 8 hours	**HS**	"hora somni"= at bed time
QID	4 times/day = every 6 hours	**M IU**	Million IU
STAT	one dose only	**GI**	gastrointestinal
PPROM	Pre-term prolonged rupture of membrane	**IUGR**	*intrauterine growth restriction*
NA	Non Applicable		

Note about storage

- ✓ if no information, storage is below 30◦c

Note about pregnancy

Always be careful when you prescribe for a pregnant woman or a breastfeeding woman

- ✓ No contraindication: can give easily
- ✓ Possible to use: can give if really needed
- ✓ Do not use during 1st trimester: specific situation we may not use
- ✓ Avoid: better not to use, but in specific situations, it may be better to use rather than not to
- ✓ Contraindication: never use, too high risk of problem

Possible to use	Do not use during 1st trimester	Avoid	Contraindication	
Cetirizine Metronidazole Paracetamol Metformin Gliclazide Methyl-dopa	Albendazole Artesunate Carbamazepine Cimetidine Co Artem Hydralazine Mebendazole Nifedipine OPV Praziquantel Pyrantel Pyrazinamide Sodium valproate Warfarin	Aspirin ABC Acetazolamide Amitriptyline BisacodylFurosemide Chlorpromazine Ciprofloxacin Deferiprone Dexoph Diazepam Domperidone EFV Fluconazole Fluoxetine Fluphenamine Haloperidol Isosorbide dinitrate Mefloquine MMR Phenobarbitone Phenytoin Tertracaine Hydrochlorthiazide	Allopurinol Benzhefixol (Artane) BCG Bromocriptine COC Copper IUD Cyclophosphamide DEC Enalapril Depo DHP Diclofenac Doxycycline Ergometrine	Griseofulvin Ibuprofen Implanon Indomethacin Itraconazole Levodopa Mefenamic acid Podophylline Primaquine Simvastatin Spironolactone Streptomycin

Note for paediatrics

- ✓ For any medication in syrup form, always check the quantity per dose, as each manufacturer may choose a different strength. Also each syrup may have a different storage condition, especially after opening
- ✓ To facilitate the intake of medicine by children, you can mix any drug with milk (except iron)

References

- BBG 2007
- BNF 61
- Vidal.fr
- MIMS Thailand
- MSF essential drug 2013
- Dorosz 2012

DRUG NAME	MTC	DRUG INFORMATION	
Acetazolamide (Diamox) **tab 250mg**	S*	**Indication**	Glaucoma
		Dosage	0.25-1g per day in divided doses *Angle closure glaucoma:* give 500mg STAT immediately, then 250mg 4 times per day until patient referred for surgery
		Contraindication	HypoK, hypoNa, adrenocortical insufficiency, sulfonamide hypersensitivity, avoid if hepatic or renal impairment
		Side-Effects	Many including blood disorders, rashes, GI disturbance, dizziness, depression, ataxia
		Interactions	
		Remarks	
		Pregnancy:	*Avoid*
		Breastfeeding:	*No contraindication*
Acyclovir **tab 200mg** **tab 400mg** *antiviral*	E	**Indication**	Genital herpes, herpes simplex virus (HSV) CNS infection, severe varicella zoster, herpes zoster virus (shingles) Chickenpox in adults.
		Dosage	*Genital*: <12yo 40-80mg/kg/day divided TID (max dose 1200mg/day); give 7-10 days or resolved; ≥12yo 400mg TID *HSV CNS* (poor treatment option): If <4mo discuss with doctor; <12yo 10-15mg/kg/dose TID (max 20mg/kg/dose); give for 10-14 days for meningitis and 14-21 days for encephalitis; ≥12yo 5-10mg/kg TID. *Shingles*: <12yo 60-80mg/kg/day divided TID; give for 7-10 days; ≥12yo 800mg 5x per day. *Chickenpox* (adult and adolescent if given within 72 hours): 800mg 5 times a day for 5 days
		Contraindication	Allergy
		Side-Effects	Headache, skin rash, allergic reaction, GI disturbance
		Interactions	
		Remarks	Start within 72 hours of symptoms or lesions appearing. Drink plenty of fluid. Reduce dose if renal impairment.
		Pregnancy:	*No contraindication*
		Breastfeeding:	*No contraindication*
Adrenaline (1/1,000) **amp 1mg /1ml**	S	**Indication**	Anaphylactic shock, severe allergic reactions, cardiac arrest, possible for severe asthma or croup
		Dosage	*Anaphylaxis:* IM undiluted (0.01mg/kg, max 0.5mg) Adult: 0.5ml Child 6yrs-12yrs: 0.25ml 6mo-6yrs: 0.12ml <6mo: 0.05ml For babies, dilute the dose in NSS to give useable volume *Cardiac arrest*: slow IV diluted Adult: 1mg Child: 0.01mg/kg *Severe asthma or coup*: nebulisation Child <4yrs: 2.5ml Child >4yrs/adult: 5ml
		Contraindication	Be careful if diabetes, ischemic heart disease, hypertension, hyperthyroidism
		Side-Effects	Arrhythmias
		Interactions	Beta-blockers, tricyclic antidepressants
		Remarks	Discard any vial with a pink or brownish colour
		Pregnancy:	*No contraindication*
		Breastfeeding:	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Albendazole **tab 200mg** **tab 400mg** *anti-helminthic*	E	**Indication**	Worm infection; ascariasis, enterobiasis, hookworm, trichuriasis, strongyloidiasis, trichinellosis
		Dosage	Child: 1-2yrs 200mg STAT; Child >2yrs/Adult: 400mg STAT *Strongyloidiasis:* Child: 1-2yrs 200mg BID 3 days; > 2yrs/Adult: 400mg BID 3 days
		Contraindication	Pregnancy, <1yr, ocular cysticercosis
		Side-Effects	Headache
		Interactions	
		Remarks	Also used for cutaneous lava migrans Take between meals
		Pregnancy:	*Contraindicated*
		Breastfeeding:	*No contraindication*
Allopurinol **tab 150mg**	S	**Indication**	Treatment of gout, with hyperuricemia, in combination with diet
		Dosage	Adult: 150mg OD, take during meal. Titrate up in 150mg steps (ie 300, 450 etc) monthly depending on uric acid level until target level reached (then continue this dose lifelong).
		Contraindication	Child <6yrs
		Side-Effects	GI disturbance, headache
		Interactions	Aminopenicillin, glibencamide
		Remarks	Monitor uric acid. Co-prescribe with colchicine 0.6mg bd for first 3 months treatment (to prevent gout flare)
		Pregnancy	*Contraindicated*
		Breastfeeding	*Contraindicated*
Aluminum Hydroxide **tab 250mg** *anti-acid*	E	**Indication**	Gastritis and peptic ulcer
		Dosage	Child: (rarely use) 25mg/kg TID Adult: 500mg-1g TID, take between meals and/or at bedtime, also when painful attacks
		Contraindication	
		Side-Effects	Constipation, diarrhoea
		Interactions	Reduces absorption of many drugs; **take 2hours from any other medication**
		Remarks	Chew tablet
		Pregnancy:	*No contraindication*
		Breastfeeding:	*No contraindication*
Aminophylline **amp 10ml** **tab 100mg**	E*	**Indication**	Prevention of apnoea of prematurity *(see SMRU Neonatal guidelines)* 2nd line treatment to consider in very severe asthma in children if salbutamol not effective or as OPD treatment in adults if there are no other treatments available
		Dosage	*Apnoea of prematurity*: Neonate <1.6kg or <34 weeks gestation: IV Loading dose 6mg/kg, IV maintenance dose 2.5mg/kg BID *Acute asthma*: Child 5mg/kg IV over 20 min; max dose: 500mg *OPD asthma treatment*: Adult: 100-300mg oral TID or QID
		Contraindication	Cardiac disease, hypertension, hypothyroidism, epilepsy
		Side-Effects	GI disturbance, palpitation, tachycardia, dizziness, neonatal irritability
		Interactions	
		Remarks	2nd line if theophylline not available
		Pregnancy:	*No contraindication*
		Breastfeeding:	*Avoid*

DRUG NAME	MTC	DRUG INFORMATION	
Amitriptyline **tab 10mg** *tricyclic antidepressant*	S	**Indication**	Neuropathic pain (eg sciatica, diabetic neuropathy etc.), migraine and tension headache prevention,major depression (2nd line), severe anxiety, nocturnal enuresis in children >6 years old
		Dosage	Adult: start 10-25mg HS. Increase monthly. Max dose: 150mg/day (for *depression*, usually 75mg OD). Use for at least 3-6 months, can be used lifelong if needed for *neuropathic pain*. Child >11yrs: start 0.1mg/kg; Max dose: 2mg/kg HS
		Contraindication	Cardiovascular disease, prostate disorders, glaucoma; be careful for old people and diabetes
		Side-Effects	Sedation, urinary retention, blurred vision, tachycardia, orthostatic hypotension, agitation, confusion, dangerous in deliberate overdose
		Interactions	Alcohol, amphetamine, cimetidine, mefloquine, tramadol, chlorpromazine
		Remarks	Analgesic effect is delayed for 7-10 days, depression, wait 3 weeks for improvement
		Pregnancy:	*Avoid*
		Breastfeeding:	*Monitor the child for drowsiness*
Amoxicillin **tab 250 mg** **tab 500mg** **syrup 125mg/5cc** *antibiotic - penicillin*	E	**Indication**	*See MTC antibiotic guideline*. Pneumonia, bronchitis, sinusitis, otitis media, streptococcal tonsillitis *(2nd line)*, dental infection, *Helicobacter pylori* infection *(in combination)*, leptospirosis Post abortion care
		Dosage	Mild-moderate: Adult and child>40kg: 250mg-500mg TID; Child <40kg: 10-25mg/kg TID; Infant ≤3mo: 25-50mg/kg/day divide TID (max 30mg/kg/day divid BID) Severe: Adult and child >40kg: 1gm TID; Child <40kg :80-100mg/kg/day divided TID; Max dose: 500mg/dose or 1200mg per day)
		Contraindication	Glandular fever (EBV), Penicillin allergy, be careful if cephalosporin allergy
		Side-Effects	GI disturbance
		Interactions	
		Remarks	Do not usually give for sore throat; Do not give for UTI (because of bacterial resistance)
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Amoxicillin/ Clavulanic acid (co-amoxiclav) **tab 500/62.5mg** **tab 500/125mg** **Syrup 500/62.5mg** **Syrup 125/31.25mg** *antibiotic - penicillin*	S	**Indication**	*See MTC antibiotic guideline*, 2nd line option for persistent tonsillitis, animal bite, 2nd line for acute otitis media/sinusitis, severe pneumonia, mastoiditis, facial cellulitis etc.
		Dosage	Expressed as amoxicillin dose Child < 40kg: 25mg/kg BID (or 15mg/kg TID); Adult/ Child >40kg: 1g BID or 500mg TID. The clavulanic acid should not exceed 375mg per day.
		Contraindication	Penicillin allergy, be careful if cephalosporin allergy, decrease if severe renal failure
		Side-Effects	GI disturbance, jaundice, cholestatic hepatitis, candida infection
		Interactions	
		Remarks	Dose ratio varies depending on manufacturer, discuss dose with senior staff or doctor
		Pregnancy:	*No contraindication*
		Breastfeeding:	*No contraindication*
Amphotericin B **Vial 50mg** *antifungal* Store between 2-8°C	i	**Indication**	Cryptococcal meningitis, severe peniciliosis or histoplasmosis
		Dosage	IV infusion: 0.7-1mg/kg over 4-6h with 5% glucose, for 1-2 weeks
		Contraindication	Be careful with renal failure
		Side-Effects	Intolerance reaction during injection: fever, hypotension, allergy; renal impairment
		Interactions	Nephrotoxic drug, drug causing hypokalaemia, digoxin, NVP, AZT
		Remarks	Need close monitoring during injection, with prior hydration
		Pregnancy:	*Late pregnancy check baby kidney function*
		Breastfeeding:	*Avoid except if must use*

DRUG NAME	MTC	DRUG INFORMATION	
Ampicillin **vial 1g** **vial 500mg** *antibiotic - penicillin*	E	**Indication**	Severe infection: septicaemia, pneumonia, peritonitis/appendicitis, meningitis, liver abscess, leptospirosis, severe tonsillitis, neonatal sepsis/meningitis, puerperal fever, septic abortion, PID Prophylaxis for PPROM
		Dosage	IV: Neonate <7 days: 50mg BID; 7-21 day old: 50mg TID; Child: 25-50mg/kg QID; Adult: 500mg-2g QID
		Contraindication	Penicillin allergy, use cautiously if cephalosporin allergy, glandular fever (EBV)
		Side-Effects	GI disturbance
		Interactions	
		Remarks	Usually needs to be combined with gentamicin. There is high resistance in this area, if patient not improving choose 2nd line antibiotic
		Pregnancy:	*No contraindication*
		Breastfeeding:	*No contraindication*

Anti-D immunoglobulin	i	**Indication**	Rhesus negative mother following delivery or abortion
		Dosage	Depends on preparation
		Contraindication	Previous splenectomy
		Side-Effects	GI disturbance, low or high BP, headache, fever
		Interactions	
		Remarks	Can also be given prophylactically during pregnancy If not given there is risk of severe jaundice and anaemia for next baby
		Pregnancy:	*No contraindication*
		Breastfeeding:	*No contraindication*

Artemether + lumefantrine **=coartem (20mg/120mg)** *antiparasite - antimalarial*	i	**Indication**	Malaria – uncomplicated falciparum
		Dosage	1-4 tab BID 3 days, depending on body weight. Take with meals (including milk)
		Contraindication	
		Side-Effects	Nausea, headache, dizziness,
		Interactions	Fluconazole, macrolides, quinolones, beta blockers
		Remarks	Should not be used as prophylaxis for malaria
		Pregnancy:	*Avoid 1st trimester*
		Breastfeeding:	*No contraindication*

Artesunate **tab 50mg** **amp 60mg** *antiparasite - antimalarial*	E	**Indication**	Malaria – *P. falciparum (refer to SMRU malaria guidelines)*
		Dosage	PO/IV: 2-4mg/kg OD for 3-7 days
		Contraindication	Efavirenz
		Side-Effects	GI disturbance, headache, dizziness
		Interactions	Take between meals
		Remarks	Always use in combination
		Pregnancy:	*No contraindication (based on SMRU data, Moore et al. 2016; WHO guidelines have not yet changed as of June 2020)*
		Breastfeeding:	*No contraindication*

Ascorbic acid **= vitamin C** **tab 500mg** **tab 50mg**	E	**Indication**	Indication and prevention of scurvy (vitamin C deficiency) Anaemia treatment to increase absorption of ferrous sulfate
		Dosage	Treatment: Child: 150-200mg/day; Adult: 500-750mg/day, until symptom improve. Prevention: Child/Adult: 25-50mg/day as long as needed
		Contraindication	Iron overload
		Side-Effects	GI disturbance, nephrolithiasis if dose >1g/day, can cause haemolysis in G6PD deficiency if large doses or if combined with other haemolytic drugs
		Interactions	
		Remarks	Can be given also to help iron (ferrous sulfate) absorption
		Pregnancy:	*No contraindication*
		Breastfeeding:	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Aspirin **=Acetylsalicylic acid** **Tab 81mg** **tab 300mg** *NSAID*	E	**Indication**	Mild pain, Fever, Rheumatic diseases, prevention of thrombosis/stroke/infarct. Prevention of eclampsia in at risk patients
		Dosage	*Analgesia*: Child >12yrs: 10-15mg/kg QID Max 100mg/kg/day; Adult: 300-900mg QID Max 4g/day. *Thrombosis prevention*: 75-100mg/day Take with meal
		Contraindication	Child <12yrs, Gastric ulcer, Dengue Fever, Gout,
		Side-Effects	Gastric irritation, Increased Bleeding Time, Bronchospasm.
		Interactions	NSAID, Corticosteroid, Spironolactone, Metoclopramide, Warfarin
		Remarks	**Be careful:** Asthma, G6PD deficiency, dehydration, gastric pain.
		Pregnancy:	*75mg dose used from 12 weeks pregnancy to prevent eclampsia*
		Breastfeeding:	*Avoid*
Atenolol **tab 25mg** **tab 50mg** *betablocker (cardioselective)*	S	**Indication**	Hypertension, prevention of angina, prophylaxis of MI, arrhythmia, cardiac failure
		Dosage	Adult: 25-50mg OD Max 100mg OD
		Contraindication	Asthma, COPD, severe depression, hypotension, bradycardia<50bpm
		Side-Effects	Bradycardia, hypotension, asthma, GI disturbances, hypoglycaemia
		Interactions	Antihypertensive drugs, nitrates, acetazolamide, ketamine, mefloquine, digoxin
		Remarks	*Beta blockers may cause IUGR*
		Pregnancy:	*No contraindication, but monitor newborn glucose*
		Breastfeeding:	*Avoid*
Atropine Sulphate **Amp 0.6mg/ml**	S	**Indication**	Premedication in anaesthesia, bradycardia (eg with cervical shock), spasms of GI tract (bile duct)
		Dosage	0.25-1mg SC or IV (under medical supervision)
		Contraindication	Urethra-prostatic disorders, cardiac disorders, glaucoma, child with high fever
		Side-Effects	Urinary retention, dryness of mouth, constipation, dizziness, headache, dilatation of pupils, tachycardia
		Interactions	With other anticholinergic drugs
		Remarks	Do not mix with other drugs in the same syringe
		Pregnancy	*No contraindication*
		Breastfeeding	*Avoid*
Azithromycin **tab 250mg** *antibiotic - macrolide*	S	**Indication**	Trachoma, scrub typhus *(for child <8yrs and pregnant & breastfeeding women)*, streptococcal tonsillitis *(if penicillin-allergy)*
		Dosage	Child >6mths: 10mg/kg STAT, then 5mg/kg/day for 4 days.4 days; Adult: 500mg STAT, then 250mg OD x 4 days.
		Contraindication	Allergy
		Side-Effects	Gastrointestinal disturbance, Stevens Johnson Syndrome
		Interactions	Artesunate, aluminium hydroxide, anti-arrythmics, anti-psychotics
		Remarks	Can be used for chancroid, genital Chlamydia trachomatis (problem with increasing resistance)
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
BCG vaccine 1ml ***Cold Chain*** Storage 2-8°C After reconstituted use within 4 hours	E	**Indication**	Prevention of TB (especially meningitis, miliary)
		Dosage	<1yr: 0.05ml; >1 yr: 0.1ml intradermal injection left upper arm
		Contraindication	Symptomatic HIV, leukaemia/lymphoma, immunosuppression – long term steroids
		Side-Effects	Normal local reaction 2-4 weeks papule, then ulcer, then scar. Occasionally discharge/cold abscess, lymphadenitis, osteitis.
		Interactions	Do not mix in the same syringe with other vaccines Clean skin with sterile water, not alcohol
		Remarks	
		Pregnancy	*Do not use*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Beclomethasone Inhaler *steroid*	i	**Indication**	Long term treatment of persistent asthma, but not for asthma attack
		Dosage	Dose depends on the severity. Try to find lowest effective dose in 2-4 divided doses: Child: 100-800mcg/day; Adult: 500-1500mcg/day
		Contraindication	Active tuberculosis
		Side-Effects	Throat irritation, oropharyngeal candidiasis
		Interactions	
		Remarks	Do education for the proper use of inhaler, if needed, use a spacer
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Benzathine benzylpenicillin (extensilline) **vial 1.2 MIU** **vial 2.4 n** *antibiotic - penicillin*	S	**Indication**	Rheumatic fever, prophylaxis for rheumatic heart disease, syphilis, severe tonsillitis, diphtheria close contact
		Dosage	*Syphilis:* 2.4 MIU IM (half dose each buttock) once per week for 3 weeks *Rheumatic fever:* Child: 25-50,000 IU/kg; Adult: 1.2 MIU IM STAT, then every 4 weeks *Severe tonsillitis:* Child: 25-50,000 IU/kg; Adult: 1.2 MIU IM STAT *Rheumatic Heart Disease Prophylaxis*: 25-50,000 IU/kg; Adult: 1.2MIU IM Stat once monthly ideally for at least 10 years, ideally with cardiac echo monitoring annually
		Contraindication	Penicillin allergy, be careful if cephalosporin allergy
		Side-Effects	
		Interactions	
		Remarks	Do not give IV – may cause cardiorespiratory arrest.
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Benzhexol (Artane) (Trihexy-phenidyl) **tab 2mg /0.25**	S	**Indication**	Extrapyramidal syndrome induced by neuroleptic, Parkinson disease
		Dosage	4 to 10mg per day in 2-3 times
		Contraindication	Glaucoma, urinary retention, instable cardiac disease
		Side-Effects	Dry mouth, visual disturbance, constipation, urinary retention
		Interactions	Chlorpheniramine, neuroleptic drugs, diazepam
		Remarks	Anticholinergic (e.g. biperiden)
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*
Benzoic acid + salicylic acid Whitfield ointment **ointment 15%** **ointment 500mg**	E	**Indication**	Can be used as an additional treatment for tinea capitis and can be used for tinea corporis (ringworm) when no ketoconazole/clotrimazole cream available. Can be used for plaque psoriasis
		Dosage	2 applications per day, sparingly on clean and dry skin, for 3-6 weeks *Psoriasis*: use twice weekly for thickened areas of skin
		Contraindication	Do not apply on superinfected or exudative lesions, mucous membrane or eyes. DO NOT USE on face
		Side-Effects	Skin irritation, local benign inflammation
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Benzyl Benzoate BBE 25% solution **liquid 450ml**	E	**Indication**	Scabies and pediculosis (pubic lice)
		Dosage	Apply to the whole body (avoid mucous membranes and eyes), do not wash for 4 hours, Severe cases may need repeated applications.
		Contraindication	Do not apply to inflamed or broken skin
		Side-Effects	
		Interactions	
		Remarks	Treat all members of the family at the same time. Wash clothes and bedding. It may be easier to use permethrin cream if treatment failure (available in Mae sot pharmacies).
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Benzylpenicillin injection ***vial 1 or 5MUI*** *antibiotic - penicillin*	S	**Indication**	Neonatal tetanus, symptomatic congenital syphilis, adult neurosyphilis, diphtheria
		Dosage	Neonate: 50mg/kg QID 10 days *(syphilis)*, 1 week *(tetanus);* Adult: *neurosyphilis*: 12-24MIU/4h 2 weeks Max dosage for moderate infections 8 MUI/day, severe infections 24 MIU/day
		Contraindication	Penicillin allergy, be careful if cephalosporin allergy
		Side-Effects	GI disturbance, kidney failure
		Interactions	
		Remarks	1 million IU = 600mg
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Betamethasone cream **Cream 0.1%** *Topical steroid*	E	**Indication**	High potency topical steroid for many inflammatory skin conditions
		Dosage	Adult and child >1 yr old: apply thinly once daily for acute treatment - maximum for 4 weeks. In *severe eczema* can use as control treatment only on weekends to prevent relapse
		Contraindication	Untreated bacterial, fungal or viral skin infections
		Side-Effects	Thinning of skin, worsening of skin infection
		Interactions	
		Remarks	Avoid chronic use. Avoid face, axillae, genital area because it can cause thinning of skin that is not reversible
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Bisacodyl **tab 5mg** *stimulant laxative*	E	**Indication**	Constipation
		Dosage	Child >3yrs: 5-10mg OD; Adult: 10-15mg HS
		Contraindication	Intestinal obstruction, inflammatory bowel disease
		Side-Effects	Diarrhoea, cramps, low potassium
		Interactions	
		Remarks	
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Bromhexine **tab 8mg** **syrup**	E*	**Indication**	Respiratory disorder with thick or excessive mucous production
		Dosage	PO: Children 2-5yrs: 2mg TID; Children 6-12yrs: 4mg TID; Adults: 8mg TID.
		Contraindication	
		Side-Effects	GI disturbance, headache, dizziness, sweating, skin rash
		Interactions	
		Remarks	Productive sputum
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Bromocriptine **tab 2.5mg**	E*	**Indication**	Prevent production of breast milk
		Dosage	2.5mg BID for 2 weeks
		Contraindication	Hypertension, serious mental disorder, heart valve or coronary artery disease
		Side-Effects	Nausea, constipation, headache
		Interactions	Erythromycin
		Remarks	
		Pregnancy	*Do Not Use*
		Breastfeeding	*Do Not Use*
Buscopan (hyoscine butylbromide) **tab 10mg** **amp 20mg/ml**	E	**Indication**	Spasms of GI tract and genitourinary tract
		Dosage	PO, IM or IV (slow injection/infusion) Child 6-12yrs: 10mg/dose, max TID; Child >12yrs to Adult: 10-20mg/dose, max QID.
		Contraindication	Child <6yrs, glaucoma, prostate problem, cardiac disorder
		Side-Effects	Constipation, heart rhythm problem, urinary urgency and retention, dry mouth, confusion
		Interactions	Erythromycin, antipsychotics, metoclopramide
		Remarks	Be careful in older people, hypertension, reflux disease, diarrhoea
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Calamine lotion 450ml **lotion 450ml** **lotion 60ml**	E	**Indication**	Symptomatic treatment of pruritus
		Dosage	Apply a thin layer 3-4 times / day, duration according to clinical response
		Contraindication	Do not apply on very infected or exudative lesions, mucous membrane or eyes
		Side-Effects	
		Interactions	
		Remarks	Use carefully on face. Shake container well before application.
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Calcium carbonate **tab 600mg**	E	**Indication**	Hypocalcaemia (prevention and treatment) and prevention of pre-eclampsia in pregnant women
		Dosage	Adults: 1-2 tablets BID
		Contraindication	
		Side-Effects	Tingling, warm flushes, dizziness
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Calcium **(Lactate) tab 300mg**	S	**Indication**	Hypocalcaemia (prevention and treatment)
		Dosage	Adults: 3 tablets TID
		Contraindication	
		Side-Effects	Tingling, warm flushes, dizziness
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Calcium gluconate 10% (or levulinate) **amp 10ml**	E	**Indication**	Severe hypocalcaemia, symptomatic hypermagnesaemia (excessive dose of magnesium sulfate)
		Dosage	Slow IV (at least 10 min) repeated as required: Child <20kg: 0.5ml/kg; Adult: 10ml;
		Contraindication	Severe renal disease, digoxin
		Side-Effects	Tingling, warm flushes, dizziness, hypercalcemia, tissue necrosis if extravasation
		Interactions	
		Remarks	Patient must lie down during injection and 30-60 min after
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Carbamazepine **tab 200mg** *anti-epileptic*	C	**Indication**	Epilepsy (*long term treatment*), neuropathic pain
		Dosage	*Increase slowly until effective dose:* Child: 2.5mg/kg BID, max: 20mg/kg/day; Adult: 100mg BID, max 2g/day.
		Contraindication	Severe heart disease, bone marrow depression; Be careful if liver or kidney disease
		Side-Effects	Dizziness, drowsiness, confusion, double vision, low sodium, low RBC-platelet-WBC
		Interactions	Doxycycline, steroids, isoniazid, valproic acid, COC, chloroquine, mefloquine
		Remarks	Do not stop treatment abruptly
		Pregnancy	*Do not start in first trimester*
		Breastfeeding	*No contraindication*
Cefotaxime **vial 500 mg** *antibiotic - cephalosporin*	E	**Indication**	Neonatal sepsis 2nd line Pneumonia, osteomyelitis, PID and UTIs etc in adults
		Dosage	<1 week old + birth weight <1500g: 50mg/kg BID; >1 week old: 150mg/kg/day divided TID-QID; Max dose: <28 days old 200mg/kg/day, ≥28 days old: 12 g/day. Adults: 1-2 g BID-TID.
		Contraindication	Cephalosporin allergy, Be careful if penicillin allergy
		Side-Effects	GI disturbance, blood disorder, jaundice
		Interactions	
		Remarks	If gentamicin contraindicated, use as 1st line
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Ceftriaxone **vial 1g** *antibiotic - cephalosporin*	E	**Indication**	Severe infection: broad coverage for most infections, *see antibiotic guideline* for details of recommended use (eg.septicaemia, pneumonia, meningitis, GI infections, severe acute malnutrition, reproductive tract infections, pyelonephritis
		Dosage	Slow IV or IM: Child: 50-80mg/kg OD (if dose>50mg/kg, give IV only), Avoid in children <2 weeks old. Adult: 1-2g OD, give BID if suspect meningitis *Gonorrhea*: 250-500mg IM STAT Max dose: moderate infections 1g/day, severe infections 4g/day
		Contraindication	Cephalosporin allergy. Avoid if < 14 days old, premature neonates or increased risk for jaundice
		Side-Effects	Allergy, headache, GI disturbance. Can cause bile sludging so be careful if <14 days old or gallbladder disease
		Interactions	
		Remarks	Once reconstituted, keep solution 1 day at <25°c or 3 days in fridge
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Chloramphenicol **eye drop**	E	**Indication**	2nd line for conjunctivitis
		Dosage	2 drops in eye up to 6 times per day
		Contraindication	
		Side-Effects	Transient stinging
		Interactions	
		Remarks	Use TEO as first line
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Chloroquine base **tab 150mg** **tab 250mg** *antiparasite - antimalarial*	E	**Indication**	Malaria - simple PV, PO, PM ***(refer to SMRU malaria guidelines)*** SLE, Rheumatoid arthritis
		Dosage	**D1:** 10mg/kg, **D2:** 10mg/kg, **D3:** 5mg/kg *For rheumatic disease*: start 150mg OD
		Contraindication	Retinopathy
		Side-Effects	GI disturbance, headache, itchy skin, visual disturbance
		Interactions	Aluminium, carbamazepine, sodium valproate
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Chlorpheniramine **=Chlorphenamine** **tab 4mg** **syrup 2mg** **amp 10mg/ml** *antihistamine*	E	**Indication**	Minor allergic reactions (seasonal allergy, allergy to drugs & food) After anaphylactic shock, give for 2 days oral to prevent relapse
		Dosage	PO: 1-2yrs: 1mg BID (max 3mg/day); 3-5yrs: 2mg/4-6h (max 6mg/day); Child 6-12yrs: 2mg/4-6h (max 12mg/day); Adult: 4mg/4-6h (max 24mg/day); IV/IM: 10-20mg/dose (max 40mg/day) Give IV over 1 minute *Duration: according to clinical response; as short as possible*
		Contraindication	Child <1yr, be careful if prostate disorder, glaucoma, elderly, epilepsy
		Side-Effects	Drowsiness, headache, urinary retention, dry mouth, palpitation, confusion, tinnitus
		Interactions	Alcohol, CNS depressant
		Remarks	Symptomatic treatment
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Chlorpromazine HCL **tab 100mg** **tab 25mg** **tab 50mg** *neuroleptic*	C	**Indication**	Acute or chronic psychosis, severe anxiety not controlled by benzodiazepines, severe prolonged hiccups, nausea and vomiting in terminal illness
		Dosage	*Psychosis:* 25mg TID increased up to maintenance dose (max 600mg) given OD at night *Anxiety*: 25-50mg TID (refer to supervisor or ask doctor) *Hiccups*: 25-50mg tid (short term max 1 week in patients admitted to IPD) *Nausea and vomiting in terminal illness* (adults): 10-25mg every 4 hours
		Contraindication	Glaucoma, prostate disorders, dementia
		Side-Effects	Drowsiness, dry mouth, blurred vision, urinary retention, constipation
		Interactions	Mefloquine, chloroquine, tramadol, carbamazepine,
		Remarks	Reduce dose gradually before stopping
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*

DRUG NAME	MTC	DRUG INFORMATION	
Cimetidine **tab 200mg** **tab 400mg** *antiulcer (H2 receptor antagonist)*	E	**Indication**	Step down treatment for gastritis, Heat rash (hives)
		Dosage	Adult: 400mg BID
		Contraindication	Phenytoin and aminophylline; be careful if liver, kidney disease, or child <12y
		Side-Effects	GI disturbance, headache, tiredness, dizziness, rash, gynaecomastia
		Interactions	Many interactions
		Remarks	Be careful not to give within 2 hours of giving aluminium hydroxide
		Pregnancy	*Do not use*
		Breastfeeding	*Contraindication*
Ciprofloxacin **tab 250mg** **tab 500mg** *antibiotic - quinolone*	E	**Indication**	*See antibiotic guidelines*. Shigellosis, typhoid fever, urinary tract infection, chancroid, cholecystitis, septicaemia (infection due to Gram-negative bacteria). Pseudomonas infection.
		Dosage	Child >1mth: 7.5-15mg/kg BID; Adult: 500mg BID. Max dosage for moderate infections 500mg/dose, for severe infections 750mg/dose.
		Contraindication	Tendinitis with ciprofloxacin; Be Careful if epilepsy, G6PD deficiency
		Side-Effects	GI disturbance, neurological disturbance, arthralgia, myalgia, tendon damage
		Interactions	Theophylline, co-artemether, if co-administered with ferrous fumarate or calcium the ciprofloxacin should be taken 2 hours before or 4 hours after
		Remarks	Reduce dose by half if renal failure; drink a lot of liquid during treatment
		Pregnancy	*Avoid*
		Breastfeeding	*No contraindication*
Clindamycin **tab 150mg** **tab 300mg** *antibiotic / lincosamid/ antimalarial*	E	**Indication**	Malaria (*refer to SMRU malaria guidelines*), osteomyelitis, 2nd line for pneumocystis jirovecii pneumonia (previously known as PCP)
		Dosage (for most bacterial infections)	Avoid in neonates; Child 1mo-16y/o: 8-25mg/kg/day divided QID, Max dose 1.8g/day; Adult: 150-450mg QID, Max dose 2.4g/day.
		Contraindication	History of allergy
		Side-Effects	Colitis (stop and give metronidazole), nausea, rash, jaundice
		Interactions	Erythromycin
		Remarks	For malaria, always use in combination. Dose may change depending on cause of infection.
		Pregnancy	*No contraindication*
		Breastfeeding	*Avoid*
Clotrimazole (clotriderm) **Cream 5-10-20mg** **cream 450mg** **vag-tab** *antifungal*	E	**Indication**	Fungal skin infection including ringworm vaginal candidiasis (2nd line) and candida balanitis
		Dosage	Apply to affected area BID or TID; Vaginal tab 200mg for 3 nights or 100mg for 6 nights
		Contraindication	
		Side-Effects	Sometimes local irritation, burning or itching
		Interactions	
		Remarks	Essential WHO list only vaginal tab
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Cloxacillin **syrup 125mg/ml** **tab 250mg** **vial 500mg** *antibiotic - penicillin*	E	**Indication**	*See MTC antibiotic guideline.* Skin infections, septic arthritis, osteomyelitis, otitis externa, severe pneumonia (*if poor response to first treatment),* umbilical sepsis, endocarditis
		Dosage	PO/IV Neonate <7d/o + <1.5kg: 25mg/kg BID; <7d/o + >1.5kg: 50mg/kg BID, or 7-28d/o any kg: 50mg/kg TID; Child: 15mg/kg QID, *if severe* 50mg/kg QID; Max dose 2g QID; Adult: 500mg QID, *if severe* 1-2g QID.
		Contraindication	Penicillin allergy
		Side-Effects	GI disturbance, neonatal jaundice, kidney failure
		Interactions	
		Remarks	Poor absorption – take 1 hour before or 2 hours after meals. Reduce dose by half if renal impairment
		Breastfeeding	*No contraindication*
		Breastfeeding	*No contraindication*

COC (Combined Oral Contraceptive) Oestrogen+ progestogen **tab** ***21 tab effective*** ***7 tab placebo***	E	**Indication**	Contraception For family planning
		Dosage	Start the 1st -5th day of menstruation or immediately after abortion or at the 21st day after childbirth not breastfeeding: 1 tab OD
		Contraindication	Breast cancer, uncontrolled hypertension, complicated diabetes, history of thromboembolic disorders, coronary insufficiency, valvular disease, stroke, severe liver disease, unexplained vaginal bleeding, migraine with neurological signs, renal impairment, hyperlipidaemia, smoker >35y/o, BMI >35
		Side-Effects	Oligoamenorrhoea, vaginal candidiasis, nausea, weight gain, breast tenderness, mood change, acne, headache
		Interactions	Rifampicin, phenytoin, carbamazepine, griseofulvin, phenobarbital, ARV
		Remarks	
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication. COC can be used in breastfeeding patients after 6 months (and considered after 6 weeks as long as there are no other contraindications)*

Colchicine **tab 0.6 mg**	i	**Indication**	To prevent acute gout attacks when starting on allopurinol for treatment of chronic gout. An alternative for acute gout treatment in patients who cannot take NSAIDS.
		Dosage	*Gout prevention dose*: 0.6mg BID for first 3 months of treatment on allopurinol *Acute gout treatment dose*: 1.2mg stat and then 0.6mg 1 hour later
		Contraindication	Severe kidney disease
		Side-Effects	Diarrhoea, GI upset, neutropenia
		Interactions	Azithromycin, erythromycin, statin, ART (protease inhibitors), grapefruit
		Remarks	
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Cotrimoxazole = Sulfamethoxazole (SMX) + Trimethoprime (TMP) **syrup** **tab 400/80mg** *antibiotic - sulfamide*	E	**Indication**	1st line treatment of Pneumocystis jirovecii (PCP), isosporiasis and brucellosis. Prophylaxis of PCP, toxoplasmosis, and bacterial infection for HIV patient
		Dosage	*PCP treatment:* Child: 100/20mg/kg/day divided 3-4 doses; Adult: 90-120mg/kg/day divided 3 doses *PCP Prophylaxis*: Child 30mg/kg OD; Max dose 960 mg/day; Adult 960mg OD. *General infections*: Child 6-12mg TMP/kg/day divided BID; max dose 960mg TMP/day Adult 160mg TMP dose BID; max dose 5760mg TMP/day.
		Contraindication	Child <1month, sulfonamide allergy, severe renal or liver failure
		Side-Effects	GI disturbance, blood disorder, neuropathy, photosensitivity, hyperK
		Interactions	Phenytoin
		Remarks	Do not use for empiric UTI treatment (resistance). Can use for susceptible organisms. Can store opened syrup for 20 days or 40 days if in fridge
		Pregnancy	*Avoid late pregnancy unless HIV*
		Breastfeeding	*Avoid if baby<1month unless HIV*
Cyclophos-phamide **tab 25mg**	S	**Indication**	Severe SLE, severe recurrent nephrotic syndrome, cancer
		Dosage	1.5-2.5mg/kg per day
		Contraindication	Bone marrow impairment, UTI
		Side-Effects	Low WBC, GI disturbance, haematuria, hair lose, skin rash, infertility, leukaemia
		Interactions	
		Remarks	Check kidney function before start; reduce dose if renal impairment
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*
Deferiprone **tab 500mg**	i	**Indication**	Iron overload in patient with thalassemia major
		Dosage	Child >6yrs/Adult: 25mg/kg TID. Take with food.
		Contraindication	Recurrent neutropenia
		Side-Effects	Neutropenia, GI disturbance, headache, arthropathy, red-brown urine, zinc deficiency
		Interactions	Aluminium Hydroxide
		Remarks	If possible, monitor CBC for neutrophils
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Depo-Progesterone **Vial** **Medroxyprogest-erone acetate** *long acting progesterone*	E	**Indication**	Contraception for family planning
		Dosage	1st injection given during first 5 days menstruation or after abortion or childbirth: 150mg IM injection every 3mths,
		Contraindication	Liver disease, family history of stroke or heart attack <45yrs, breast cancer. Use cautiously if >40yrs old, diabetes or obese
		Side-Effects	Irregular or no vaginal bleeding, nausea, weight gain
		Interactions	
		Remarks	Return of fertility may be delayed for 3-12mths after stopping
		Pregnancy	*Contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Dexamethasone **tab 0.5mg** **amp 4mg/ml** *steroid*	E	**Indication**	Anaphylactic shock, severe allergic reaction, Inflammatory syndrome in severe infection *(if on antibiotic treatment)*, foetal lung maturation *(risk of premature delivery <34 weeks of gestation)*
		Dosage	IM/slow IV: Child: <8kg 1mg; 8-15kg 3mg; 15-30kg: 5mg; >30kg 8mg; Adult: 12mg *Dose and duration vary according to severity and clinical response.* *For foetal lung maturation:* give to the mother 8mg IM TID in 24h
		Contraindication	Peptic ulcer, uncontrolled bacterial/parasitic infection, acute viral infection
		Side-Effects	If prolonged treatment: fluid retention, increase susceptibility to infection, growth retardation
		Interactions	
		Remarks	Deworm with albendazole 400mg BID for 3 days (to clear strongyloides) before starting dexamethasone. If treatment longer than 10 days, decrease dose gradually. Dexamethasone 0.75mg ⇔ prednisolone 5mg ⇔ hydrocortisone 20mg
		Pregnancy	*No contraindication, for short period*
		Breastfeeding	*No contraindication*

Dexoph eye (=Decordex-N) **eye drop** **neomycin + dexamethasone**	E	**Indication**	Otitis externa, After eye surgery
		Dosage	1 or 2 drops 4-6 hourly, 6-7 days
		Contraindication	Trachoma, corneal ulcer, viral or fungal or TB eye infection not controlled
		Side-Effects	Delay to cure corneal wound, high eye pressure, predisposes to fungal infection
		Interactions	
		Remarks	Use after eye exam; Used after eye surgery
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*

Diazepam **tab 5mg** **amp 10mg/2ml** *benzodiazepine*	C	**Indication**	Convulsion/seizure, agitation and anxiety, muscle spasms, tetanus, pre-procedure
		Dosage	PO: Child: 0.5mg/kg/day; Adult: 5 to 15mg/day. *Slow IV* STAT: Child: 0.3mg/kg (can give per-rectum (PR)); Adult: 5-10mg. Repeat every 2-5 min to maximum 5mg but can repeat again in 2 hours. Max dose 10mg/dose (no max daily dose; large doses maybe needed in some cases like tetanus).
		Contraindication	Respiratory depression, asthma, liver failure
		Side-Effects	Drowsiness, dependence if >2 weeks of use, overdose (ataxia, confusion, respiratory depression)
		Interactions	Chlorpheniramine, phenytoin, alcohol
		Remarks	For shortest duration possible (addiction), not a treatment for any chronic problem, chronic insomnia, anxiety or post-traumatic stress syndrome. Avoid for neonate unless no other option for convulsion
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*

Diclofenac **tab 25mg** **tab 50mg** **amp 25mg/ml** **amp 75mg/ml** *NSAID*	E*	**Indication**	Moderate pain, particularly due to inflammation (acute sciatic neuralgia, renal colic)
		Dosage	PO: Adult: PO 25-50mg TID; Child: 1mg/kg BID or TID. Take with meal IM: 75mg OD
		Contraindication	Renal or hepatic impairment, cardiovascular diseases, severe malnutrition, peptic ulcer, coagulation defects, severe infection, dehydration, allergy to NSAIDs
		Side-Effects	Epigastric pain, peptic ulcer, haemorrhage, allergic reactions, renal impairment
		Interactions	Diuretic, other NSAID (do not combine), anticoagulants
		Remarks	Be careful with asthma
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Diethyl-carbamazine (DEC) **tab 300mg** *antihelminthic* Store between 15-30°C	S	**Indication**	Lymphatic filariasis
		Dosage	6mg/kg single dose in combination with albendazole 400mg single dose OR 6mg/kg daily for 12 days monotherapy
		Contraindication	Elderly, infants, pregnancy, breastfeeding, heart or renal disease
		Side-Effects	Fever, myalgia, headache, anorexia, abdominal discomfort. Can cause severe adverse reactions (skin or eye symptoms, shock) if treat patients who are co-infected with onchoceriasis or loiasis.
		Interactions	
		Remarks	Do not use during acute attack. Be careful if history of seizures. Single annual dose may be given in national eradication program There are various treatment protocols, including combination with doxycycline, and re-treatment after 6 mths
		Pregnancy	*Contraindication*
		Breastfeeding	*Not recommended*
Digoxin **tab 0.25mg**	E	**Indication**	Heart failure, supraventricular arrhythmia (Fibrillation, flutter, paroxysmal tachycardia)
		Dosage	0.125 to 0.25mg OD
		Contraindication	Bradycardia, coronary artery disease, calcium
		Side-Effects	GI disturbance, headache, confusion, rhythm disorders, blurred vision indicates overdose
		Interactions	Quinine, chloroquine, diuretics, steroid, macrolides, itraconazole, amphotericin B
		Remarks	Narrow margin between therapeutic and toxic dose; check blood level
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Dihydroartemisinin/Piperaquine (DP) **Tab 20/160mg** **Tab 40/320mg** *Antiparasite/ antimalarial*	I	**Indication**	Uncomplicated malaria *(refer to SMRU malaria guidelines)*
		Dosage	Dose expressed as DHA component
		Contraindication	Heart failure, arrhythmia, erythromycin, haloperidol, fluconazole
		Side-Effects	Cardiac disorders, tachycardia, GI disturbance
		Interactions	Rifampicin, carbamazepine, phenytoin, phenobarbital, antiretroviral
		Remarks	
		Pregnancy	*Contraindicated*
		Breastfeeding	*No contraindication*
Domperidone **tab 10mg**	E	**Indication**	To increase breast milk supply, neonatal gastro-oesophageal reflux, nausea and vomiting
		Dosage	Neonate: 250 mcg/kg TID (max dose 400 mcg/kg QID) >12 yrs old and Adult: 10-20mg TID
		Contraindication	Intestinal obstruction
		Side-Effects	GI disturbances, rarely; arrhythmias, drowsiness, seizures, dry mouth, headache
		Interactions	
		Remarks	For neonatal use, discuss with senior staff; also useful for nausea, vomiting & hiccups
		Pregnancy	*Avoid*
		Breastfeeding	*No contraindication*
Doxazosin **tab 2mg** *alpha 1 blocker*	I*	**Indication**	Benign prostate hypertrophy (BPH), Hypertension, to help stone pass with renal colic
		Dosage	2mg per day, evening meal; can increase to 8mg per day. For renal colic 1-4mg HS for 4 weeks or until stone passes
		Contraindication	Woman, child, liver impairment
		Side-Effects	Sexual disturbance, hypotension, dizziness, headache, tiredness or weakness
		Interactions	
		Remarks	Check PSA before to rule out carcinoma
		Pregnancy	*NR*
		Breastfeeding	*NR*

DRUG NAME	MTC	DRUG INFORMATION	
Doxycycline **tab 100mg** **tab 200mg** *antibiotic – tetracycline/ antimalarial*	E	**Indication**	Malaria (*refer to SMRU malaria guidelines)*, Leptospirosis, Scrub typhus, Chlamydia, Trachoma, Lymphatic filariasis
		Dosage	Adult: 200mg STAT, then 100mg OD; Child >8yo: 2mg/kg BID or 4mg/kg OD. Take with meal. Max dose 200mg/day
		Contraindication	Child <8yrs, allergy
		Side-Effects	headache, photosensitivity
		Interactions	Phenytoin, phenobarbitone, carbamazepine, iron preparations, antacids
		Remarks	**For malaria, always use in combination with other drugs**
		Pregnancy	*Contraindication*
		Breastfeeding	*Avoid*
DTP Vaccine (DT whole cell P) **5ml** ***Cold Chain*** Storage 2-8°C	E	**Indication**	Prevention of diphtheria, pertussis and tetanus
		Dosage	0.5ml IM, follow Thai or Myanmar vaccination guidelines Leave minimum of 4 weeks between doses
		Contraindication	Significant reaction to previous DTP. Encephalopathy/uncontrolled epilepsy
		Side-Effects	Local reaction, fever within 24 hours, rarely anaphylaxis and seizures
		Interactions	
		Remarks	Also available: DTaP (Acellular pertussis vaccine), DTP-hep B
		Pregnancy	*Use dT during pregnancy*
		Breastfeeding	*Use dT in adult – no contraindication*
Enalapril **tab 20mg** **tab 5mg** *antihypertensive - ACE inhibitor*	E	**Indication**	Hypertension, congestive heart failure, diabetic nephropathy
		Dosage	Starting dose Hypertension: 5-10mg OD titrate up to target BP; Heart failure, diabetic nephropathy: 2.5mg OD. Maximum 40mg OD
		Contraindication	Hypersensitivity to enalapril
		Side-Effects	Hypotension, dry cough, hyperkalaemia, headache, dizziness, nausea, renal impairment, allergic reactions
		Interactions	Alcohol, nitrates, other antihypertensive drugs
		Remarks	Reduce dose in renal impairment, be careful of potassium levels if using with diuretic, causes cardiovascular, neurologic and kidney abnormalities in the foetus
		Pregnancy	*Contraindication*
		Breastfeeding	*No contraindication*
Enema Sodium chloride 15% *laxative*	i	**Indication**	Constipation
		Dosage	STAT, repeat according to response
		Contraindication	Severe/unexplained bowel obstruction, rectal bleeding
		Side-Effects	
		Interactions	
		Remarks	Laxative, purgative (introducing liquids into the rectum and colon via the anus)
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Ergometrine **vial 1ml** Storage 2-8°C	E	**Indication**	2nd line post-partum haemorrhage (PPH)
		Dosage	0.2mg STAT IM or slow IV
		Contraindication	Pre-eclampsia and high BP
		Side-Effects	Rise in BP, GI disturbance, headache, dizziness, chest pain, palpitations, tinnitus
		Interactions	
		Remarks	Check BP before giving
		Pregnancy	*NA*
		Breastfeeding	*Avoid*

DRUG NAME	MTC	DRUG INFORMATION	
Erythromycin **Syrup** **tab 250mg** *antibiotic - macrolide*	E	**Indication**	*See MTC antibiotic guideline.* Use when 1st line treatment not possible (e.g. penicillin-allergy) for pneumonia, otitis, STI including syphilis, leptospirosis, streptococcal infection (tonsillitis or skin) Prophylaxis for PPROM, Diphtheria (treatment and close contact)
		Dosage	PO: Child: 30-50mg/kg/day; Adult: 1-2g/day in 2-3 divided doses. Max dose for moderate infections 2000mg/day, severe infections 4000mg/day
		Contraindication	Allergy to macrolide, do not give with Aminophylline, carbamazepine
		Side-Effects	Diarrhoea, rashes, arrhythmia
		Interactions	Digoxin, cimetidine, ergometrine
		Remarks	Use carefully if cardiac disease, prolonged QT interval. Take between meals
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

Ethambutol (E) **tab 100mg** **tab 400mg** HRZE H 75mg, R 150mg, Z 400mg, E 275mg *antibiotic - anti-TB*	i	**Indication**	TB (in combination with other anti-TB drugs)
		Dosage	E 15-25mg/kg OD; Reduce dose to 3 times per week if renal impairment. HRZE Weight based dose: 20-34kg 2tab, 35-39kg: 2.5tab, 40-54kg: 3tab, 55-70kg: 4tab, >70kg: 5tab
		Contraindication	Severe renal impairment or pre-existing optic neuritis
		Side-Effects	Retrobulbar optic neuritis, visual problem
		Interactions	
		Remarks	Stop immediately and get expert advice if visual problem. (Usually reversible).
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

F.B.C. **Tab**	E*	**Indication**	Prevention and treatment of anaemia
		Dosage	1 tab BID or TID
		Contraindication	Iron overload, thalassemia, severe liver disease
		Side-Effects	GI disturbance, change stool colour
		Interactions	
		Remarks	Fe 200mg, vit B1 2mg, B2 2mg, B12 5mg, C 20mg, B3 10mg, FA 100mcg, Ca 100mg
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

Ferrous Sulphate **tab 200mg** **tab 50mg**	E	**Indication**	Prevention (pregnancy, malnutrition) and treatment of anaemia
		Dosage	Child <5kg: 50mg; Child >5kg: 100-200mg; Adult: 200mg. Take with meal. Prevention: give OD (for Child: 1-2mg/kg/day) *Treatment:* give TID (for Child: 3-6mg/kg/day)
		Contraindication	Sickle cell anaemia, thalassemia, severe liver disease
		Side-Effects	GI disturbance, including constipation and change of stool colour
		Interactions	Ciprofloxacin, doxycycline, methotrexate, antacids (decrease effect if taken at the same time)
		Remarks	200mg of ferrous sulfate contains 65mg of element iron
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication; for child, give to mother*

DRUG NAME	MTC	DRUG INFORMATION	
Finasteride **tab 5mg** *5 alpha reductase inhibitor*	j*	**Indication**	Benign prostate hypertrophy (BPH)
		Dosage	1 tab of 5mg per day
		Contraindication	Woman, child, liver impairment
		Side-Effects	Sexual disturbance, allergy, chill, cold sweat, confusion, dizziness
		Interactions	
		Remarks	Check PSA before to rule out carcinoma. 1mg dose used for male pattern baldness!
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*
Fluconazole **tab 200mg** *antifungal*	E	**Indication**	Oral/oesophageal candidiasis, severe ringworm; cryptococcal meningitis treatment & prophylaxis (if HIV and CD4 <100), recurrent vaginal candidiasis
		Dosage	PO: Child: 2-4mg/kg OD; Max dose in child 400mg/dose. Adult: 100-800mg OD. Vaginal candida infection: normally 150mg stat (or 200mg). in recurrent thrush discuss with CC about a possible weekly regimen
		Contraindication	
		Side-Effects	GI disturbance, headache, skin reaction, anaphylaxis, liver disorder, blood disorder
		Interactions	Rifampicin (administer 12 hours apart), chloroquine, erythromycin, haloperidol, mefloquine, quinine, co-artem, warfarin, carbamazepine, phenytoin, benzodiazepines, calcium channel blockers, ART (NVP, AZT)
		Remarks	Give half dose if renal impairment, use cautiously if heart or liver disease
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Fluphenazine **vial 25mg/ml** *neuroleptic*	C	**Indication**	Maintenance treatment for psychosis/schizophrenia
		Dosage	1 injection (IM) of 12.5mg to 100mg, every 2 weeks (refer to supervisor)
		Contraindication	Child, coma status
		Side-Effects	Extrapyramidal symptoms, neuroleptic malignant syndrome, hypotension, drowsiness
		Interactions	
		Remarks	Long-acting depot injections are used for maintenance therapy especially when compliance with oral treatment is unreliable
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Folic Acid = calcium folinate=vitamin B9 **tab 5mg**	E	**Indication**	Megaloblastic anaemia: malnutrition, repeat attack of malaria, intestinal parasitosis, diabetics/epileptics need higher dose to prevent neural tube defects Prophylaxis of neural tube defects (very early pregnancy)
		Dosage	*Folic acid deficiency*: Child: 2.5mg OD;Adult: 5mg OD. *Prevention dose*: 5mg per week in low risk patients, 5mg OD for prenatal use in diabetics and epileptics
		Contraindication	
		Side-Effects	
		Interactions	
		Remarks	Be careful if suspect/confirmed malignancy
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication; for child, give to mother*

DRUG NAME	MTC	DRUG INFORMATION	
Fosfomycin **Inj** **tab**	I	**Indication**	Alternative antibiotic for uncomplicated cystitis caused by ESBL (UTI in children and males are considered complicated cystitis; discuss with doctor in these patients).
		Dosage	>40kg: 3gm oral single dose or 6gm IV BID, max IV dose is 8gm/dose
		Contraindication	Adjust dose in kidney and liver disease
		Side-Effects	
		Interactions	
		Remarks	Use only as an alternative treatment for uncomplicated UTI caused by ESBL bacteria (resistant)
		Pregnancy	*No contraindication*
		Breastfeeding	*Present in breast milk, consider benefit of treatment case by case*
Furosemide **tab 40mg** **amp 20mg/2ml** **amp 40mg/2ml** *loop diuretic*	E	**Indication**	Oedema caused by renal, hepatic or congestive heart failure; hypertension, pulmonary oedema. If acute kidney injury from malaria, *see SMRU malaria guidelines*.
		Dosage	Child: 1-2mg/kg OD, up to every 6 hr. Max child dose: 80mg/day Adult: 20-40mg OD; *if persistent pulmonary oedema: 80-150mg.* Max adult dose: 600mg/day
		Contraindication	Other types of oedema (kwashiorkor, hepatic encephalopathy)
		Side-Effects	Hypokalaemia, poor nutritional status, dehydration, orthostatic hypotension
		Interactions	Digoxin (enhances toxicity of digoxin), gentamicin, streptomycin, indomethacin
		Remarks	Be careful when use for diabetes, advise to eat a lot of fruit (fruit contains potassium), do not give for peripheral oedema
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Gentamicin **amp 80mg/2ml** *antibiotic - aminoglycoside*	E	**Indication**	Severe infection: endocarditis, septicaemia, pneumonia, peritonitis/appendicitis, meningitis, liver abscess, neonatal sepsis/meningitis, puerperal fever, septic abortion, PID Always in combination with another antibacterial
		Dosage	IV 5-7mg/kg OD 2-5 days, max dose 360mg
		Contraindication	Renal failure, nephrotoxic drugs (diuretics/metformin)
		Side-Effects	Ear and kidney toxicity
		Interactions	
		Remarks	Do not prolong treatment unnecessarily
		Pregnancy	*Avoid*
		Breastfeeding	*No contraindication*
Gentamicin **cream** **5g tube** *antibiotic - aminoglycoside*	E*	**Indication**	Minor skin infections (such as impetigo, folliculitis) or minor infections related to some skin conditions (such as eczema, psoriasis, minor burns/cuts/wounds)
		Dosage	Apply a thin film to affected area TID
		Contraindication	
		Side-Effects	Transient irritation
		Interactions	
		Remarks	Discontinue if infection gets worse
		Pregnancy	*Avoid*
		Breastfeeding	*No contraindication*
Gentamicin **eye drop** *antibiotic*	E*	**Indication**	Conjunctivitis, Otitis externa 2nd line for prevention of gonococcal or chlamydial conjunctivitis for neonates
		Dosage	1-2 drop In each eye 3-8 times per day
		Contraindication	Gentamicin allergy
		Side-Effects	
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Glibencamide **tab 5mg** *diabetic medication*	E	**Indication**	Diabetes, non-insulin dependent or not controlled by well followed diet
		Dosage	2.5 to 5mg OD morning; adjust dosage until diabetic control. Max dose: 15mg/day
		Contraindication	Insulin dependent diabetes, juvenile diabetes, renal, hepatic or thyroid problem
		Side-Effects	Hypoglycaemia due to excessive dose, allergic reaction
		Interactions	Alcohol
		Remarks	Need blood glucose monitoring regularly
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Glicazide *diabetic medication*	i*	**Indication**	Diabetes, non-insulin dependent or not controlled by well followed diet
		Dosage	Adults: 40-80mg OD up to maximum 160mg BID
		Contraindication	Pregnancy and breastfeeding
		Side-Effects	GI disturbance, cholestatic jaundice
		Interactions	Alcohol
		Remarks	Need blood glucose monitoring regularly
		Pregnancy	*Contraindicated*
		Breastfeeding	*Contraindicated*
Glucose hyper 50% **amp 10ml** **amp 20ml**	E	**Indication**	Hypoglycaemia blood glucose <2.5mmol/L
		Dosage	1ml/kg bolus IV slowly direct IV injection IV infusion
		Contraindication	Do not administer hypertonic solution IM/SC
		Side-Effects	Local inflammation – irritant to veins
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Griseofulvin *antifungal*	E	**Indication**	Fungal infection, ringworm
		Dosage	PO: Child: 10-20mg/kg OD; Adult: 500mg OD or 750mg if severe infection. Take with meal. Treat 4-6 wks for tinea capitis, 2-4 wks for tinea corporis
		Contraindication	Severe liver disease
		Side-Effects	Headache, dizziness, blood disorders, can cause fulminant hepatitis (consider checking baseline liver function tests in patients ≥35 years old)
		Interactions	Oral contraceptive, anticoagulant, alcohol (avoid)
		Remarks	Men: do not make partner pregnant during and for 6 mths after treatment Woman: avoid pregnancy during and for 1 month after treatment
		Pregnancy	*Contraindicated if liver enzymes are elevated*
		Breastfeeding	*Contraindicated*
Haloperidol 0.5mg **tab 0.5mg** **tab 2mg** **tab 5mg** **vial 5mg** *neuroleptic*	C	**Indication**	Acute or chronic psychosis, severe anxiety not controlled by benzodiazepines
		Dosage	*Psychosis:* 1-5mg BID, increased to maximum 10mg BID *Anxiety*: 0.5mg BID (refer to supervisor)
		Contraindication	Cardiac disorders, dementia
		Side-Effects	Drowsiness, sexual dysfunction, arrhythmias
		Interactions	Carbamazepine, rifampicin, chloroquine, fluconazole, erythromycin, mefloquine, quinine
		Remarks	Avoid alcohol
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*

DRUG NAME	MTC	DRUG INFORMATION	
Hepatitis B vaccine **0.5ml** **1ml** ***Cold Chain*** Storage 2-8°C	E	**Indication**	Prevention of hepatitis B
		Dosage	Neonate and child, 16yrs: 10 micrograms IM given at Birth, 6 weeks, and 18 weeks Adult: 20 micrograms IM 3 doses given at month 0, 1 and 12 There are different vaccine schedules, *refer to national vaccine schedules* or package insert.
		Contraindication	Previous severe reaction. Postpone if fever >38°C
		Side-Effects	Local skin reaction, fever, rarely anaphylaxis
		Interactions	
		Remarks	Shake vial before use. Also available at MTC: Hep B combined with DTP
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Hydralazine **vial 20mg** *antihypertensive*	S	**Indication**	Severe hypertension in pregnancy, if systolic BP≥160mmHg and diastolic BP ≥ 110. Malignant hypertension
		Dosage	Slow IV protocol (mix with 20cc of NSS): 5mg over 2 min, and monitor BP for 20 min; if needed, repeat the injection, maximum 4 injections (20mg), waiting 20min between each. Goal: diastolic BP <110mmHg but never fall below 90
		Contraindication	Stroke, kidney disease, HR>140/min, heart failure.
		Side-Effects	Tachycardia, nauseas, vomiting, palpitation, headache, hypotension,
		Interactions	Alcohol, other antihypertensive drugs, NSAID, steroid, COC
		Remarks	Adjust dosage according to BP; monitor BP (can drop abruptly), pulse, Fetal heart sounds
		Pregnancy	*Avoid during 1st trimester*
		Breastfeeding	*No contraindication*
Hydrochloro-thiazide **tab 50mg** *diuretic*	E	**Indication**	Hypertension
		Dosage	Initial adult dose: 12.5mg OD, Max dose: 50mg OD
		Contraindication	Severe renal/liver failure, gout, pregnancy, kwashiorkor
		Side-Effects	Low potassium, high glucose, dehydration. If use with spironolactone be careful of high potassium.
		Interactions	
		Remarks	Be careful when use for diabetes, Advise to eat a lot of fruit (fruit contains potassium)
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Hydrocortisone Cream 1% *steroid*	E	**Indication**	Inflammatory skin disorders e.g. eczema
		Dosage	Apply thinly to affected area OD or BID
		Contraindication	Untreated bacterial, fungal or viral skin infections
		Side-Effects	Thinning of skin, worsening of skin infection
		Interactions	
		Remarks	Avoid prolonged use – increased risk of steroid related side effects
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Ibuprofen **tab 200mg** **tab 400mg** **syrup 100mg** *NSAID*	E	**Indication**	Mild to moderate pain (including post-operative period), fever, rheumatic disease. *Refer to SMRU Neonatal guidelines for ibuprofen dosing in PDA closure.*
		Dosage	Child: 2.5-10mg/kg TID; Adult: 400mg TID-QID. Take with meal.
		Contraindication	Renal or hepatic impairment, severe malnutrition, peptic ulcer, coagulation defects, severe infection, dengue fever, severe heart failure, dehydration, allergy to NSAIDs
		Side-Effects	Epigastric pain, peptic ulcer, haemorrhage, allergic reactions, renal impairment
		Interactions	Diuretic, other NSAID (do not combine), anticoagulants
		Remarks	Be careful with asthma Once opened, store oral suspension between 8°C and 15°C
		Pregnancy	*Contraindication*
		Breastfeeding	*Short term treatment*
Implanon **Progestogen**	E	**Indication**	Long term reversible contraception – 3yrs
		Dosage	Insertion during the first 7 days of menstruation or immediately after abortion or after childbirth), with a sterile applicator, subdermally into the inner side of the non-dominant arm, 6-8cm above the elbow crease
		Contraindication	Breast cancer, severe liver disease, unexplained vaginal bleeding, current thromboembolic disorders
		Side-Effects	Headache, acne, oligoamenorrhoea, menometroragia, mood change, weight gain, abdominal pain, GI disturbance, allergic reaction
		Interactions	Rifampicin, phenytoin, carbamazepine, griseofulvin, phenobarbital, ARV
		Remarks	Should be palpable under the skin; for removal, use anaesthesia, scalpel and forceps
		Pregnancy	*Contraindicated*
		Breastfeeding	*No contraindication*
Insulin **(short acting)** Keep 2-8°C (fridge)	i	**Indication**	Insulin dependent diabetes, diabetic ketoacidosis (DKA)
		Dosage	*Subcutaneous injection, dose varies depending on patient needs* Aim blood glucose 4.4-8mmol/L. Take before meals.
		Contraindication	Hypoglycaemia
		Side-Effects	Hypoglycaemia, local skin reaction, lipodystrophy
		Interactions	
		Remarks	Patient should rotate sites of injection to prevent lipodystrophy Often administer in combination with intermediate or long-acting insulin
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Intermediate / **Long acting insulin** Keep 2-8°C (fridge)	i	**Indication**	Insulin dependent diabetes
		Dosage	*Subcutaneous injection, dose varies depending on patient needs* Aim for blood glucose 4.4-8mmol/L
		Contraindication	Never administer by IV injection, Hypoglycaemia
		Side-Effects	Hypoglycaemia, local skin reaction, lipodystrophy
		Interactions	
		Remarks	Often administer in combination with short-acting insulin
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Isoniazide (H) **tab 100mg** **tab 300mg** HRZE H 75mg, R 150mg, Z 400mg, E 275mg HR H 150mg- R 300mg *antibiotic - anti-TB*	i	**Indication**	TB (in combination with other anti-TB drugs) and TB prophylaxis
		Dosage	H Adult: 300mg/day HRZE Weight based dose: 20-34kg: 2tab, 35-39kg: 2.5tab, 40-54kg: 3tab, 55-70kg: 4tab, >70kg: 5tab HR Child <30kg: 5-10mg/kg OD; Adult: 21-54kg: 1tab, 55-70kg: 2tab, >70kg: 2.5tab
		Contraindication	Severe hepatic impairment
		Side-Effects	Peripheral neuropathy, jaundice, hypersensitivity
		Interactions	Carbamazepine and phenytoin
		Remarks	Give with Vitamin B6 10mg to prevent neuropathy
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication, give baby Vit B6 5mg/day*
Isopto Carpine/ Pilocarpine 2% eye drop	E	**Indication**	Glaucoma
		Dosage	1-2 drops in eye TID or QID
		Contraindication	Child, retinal detachment
		Side-Effects	Blurred vision, headache, rarely retinal detachment
		Interactions	
		Remarks	Only works when eye pressure is not too high. Use in conjunction with acetozolamide in angle closure glaucoma
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Isosorbide dinitrate **tab 10mg** *antianginal*	E	**Indication**	Prophylaxis & treatment of acute angina and MI, congestive heart failure
		Dosage	Adult: start 10mg BID, gradually increase. Max dose: 30mg QID *If for treatment of acute angina/MI*: give sublingually 5-10mg
		Contraindication	Hypotension, heart valve problems, severe anaemia; be careful if hypothyroidism
		Side-Effects	Headache, flushing, hypotension, tachycardia, haemolysis in G6PD deficiency
		Interactions	
		Remarks	
		Pregnancy	*Avoid*
		Breastfeeding	*Not recommended*
Itraconazole **tab 100mg** *antifungal*	S*	**Indication**	Peniciliosis, histoplasmosis, dermatophytosis of the scalp (tinea capitis)
		Dosage	*Peniciliosis:* treatment 200mg BID prevention 200mg OD *Dermatophytosis*: Child: 3-5mg/kg; Adult: 200mg OD, for 2-4 weeks.
		Contraindication	Quinidine
		Side-Effects	GI disturbance, anaphylaxis,
		Interactions	Steroids, digoxin, carbamazepine, PI, diazepam
		Remarks	If prolonged, monitor liver function
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*
IUD copper *contraceptive*	E	**Indication**	Contraception (long term reversible); emergency contraception (EC)
		Dosage	1 device inserted into uterine cavity, for 5yrs For emergency contraception, insert within 5 days of intercourse
		Contraindication	Recent STI, severe anaemia, PID, unexplained PV bleeding
		Side-Effects	Painful heavy or irregular menstruation
		Interactions	
		Remarks	Insert after menstruation finished. If possible screen for STI before insertion.
		Pregnancy	*Do Not Use*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Japanese encephalitis vaccine JE **0.5ml** ***Cold Chain*** Storage 2-8°C	E	**Indication**	Prevention of Japanese encephalitis
		Dosage	0.5ml IM at 18 mths, 19 mths, 2yr 7 mths *Vaccine schedule depends on national vaccine schedules* or refer to package insert.
		Contraindication	Previous severe reaction, postpone if fever >38°C
		Side-Effects	Local skin reaction, fever, rarely anaphylaxis
		Interactions	
		Remarks	
		Pregnancy	*Avoid; assess benefit to the mother*
		Breastfeeding	*Avoid; assess benefit to the mother and risk to the infant*
Labetalol **tab 40mg** *betablocker*	i*	**Indication**	Hypertension
		Dosage	Adult: 100mg BID, Max 400mg BID; Old people: start 50mg BID
		Contraindication	Asthma, COPD, bradycardia, hypotension,
		Side-Effects	Hypotension, tiredness, headache, weakness, rash, scalp tingling, difficulty passing urine
		Interactions	Aminophylline, NSAIDs, rifampicin, steroids, contraceptive pill, anti-diabetic drugs
		Remarks	*Beta blockers may cause IUGR; labetalol is best beta blocker to use during pregnancy*
		Pregnancy	*No contraindication for mother - monitor newborn glucose after delivery*
		Breastfeeding	*Avoid*
Lactulose **15ml / dose-sachet** *laxative*	E	**Indication**	Constipation (2nd line) especially for child and pregnant woman; hepatic encephalopathy (reduce hyperammonemia)
		Dosage	*Constipation:* Infant <1yr: 5mL; Child 6-14ysr: 15mL; 1-6yrs: 5-10mL; *Adult 15-45ml/day.* *Encephalopathy:* 30-45ml TID according to response
		Contraindication	Bowel obstruction, inflammatory bowel disease
		Side-Effects	Diarrhoea
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Lidocaine (xylocaine) **1%-10mg/ml, 50ml vial** **2%-20mg/ml, 50ml vial** **(for dental)**	S	**Indication**	Local anaesthesia for trauma, incision, suturing or procedure for treatment or investigation.
		Dosage	The volume to be injected depends on the surface area to be anesthetized; Max dose: Child: 5mg/kg; Adult: 200mg IM or SC (1%: 200mg=20ml; 2%: 200mg=10ml)
		Contraindication	Allergy to lidocaine, impaired cardiac conduction
		Side-Effects	
		Interactions	
		Remarks	Be careful: infected tissue/abscess - risk of spreading the infection If accidentally given IV can cause severe hypotension
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Lidocaine (xylocaine) with Adrenaline (epinephrine) **2% / 1:100000 vial**	S	**Indication**	Local anaesthesia for dental procedures, lidocaine combined with adrenaline prolongs anaesthesia and reduces bleeding
		Dosage	*(see lidocaine)*
		Contraindication	*(see lidocaine)*, Never use for the anaesthesia of extremities, risk of ischemia and necrosis
		Side-Effects	
		Interactions	
		Remarks	*(see lidocaine)*
		Pregnancy	*(see lidocaine)*
		Breastfeeding	*(see lidocaine)*

DRUG NAME	MTC	DRUG INFORMATION	
Loperamide **tab 2mg**	S	**Indication**	Chronic diarrhoea with HIV
		Dosage	Child 4-8yrs: 1mg QID max 3 days; Child 8-12yrs: 2mg QID max 5 days Adult: 4mg STAT then 2mg after each loose stool. Maximum dose 16mg per day for 5 days
		Contraindication	Child under 2yrs, bloody or Infective diarrhoea, abdominal distension
		Side-Effects	Abdominal cramps, dizziness, rash, constipation
		Interactions	
		Remarks	Use very cautiously
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Loratadine or Cetirizine **tab 10mg** *antihistaminic H1*	i	**Indication**	Minor allergic reactions (contact dermatitis, seasonal allergy, allergy to drugs & food), urticaria
		Dosage	Child <6yrs: 5mg OD; Adult & Child >6yrs: 10mg OD.
		Contraindication	Child <2yrs, QT prolonged, severe kidney or liver disease
		Side-Effects	Headache, drowsiness
		Interactions	
		Remarks	Symptomatic treatment
		Pregnancy	*Possible to use, discuss with doctor*
		Breastfeeding	*Possible to use, discuss with doctor*
Magnesium **Tab**	S*	**Indication**	For supplementation feeding, for malnourished child, low magnesium level
		Dosage	According to protocol: around 0.4-0.6mmol/kg/d(12mg/kg/day)
		Contraindication	
		Side-Effects	Constipation, diarrhoea
		Interactions	Be careful to take 2h from any other drug, not to reduce efficacy
		Remarks	Sometimes used in combined tablet with aluminium hydroxide for GERD
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Magnesium sulphate **amp 10%/2ml** **amp 50%/2ml**	S	**Indication**	Eclampsia (treatment) and severe pre-eclampsia (prevention);; severe asthma
		Dosage	*Loading dose*: 4g IV in 10 min or 10g IM; *Maintenance dose:* 1g/h IV or 4g IM/4h *Continue 24 hour after last convulsion/delivery* *For asthma*: Child: 40mg/kg; Adult: 1-2g (in NSS) in 20 min infusion;
		Contraindication	Severe renal failure
		Side-Effects	Overdose: decreased patellar/knee reflex, hypotension, arrhythmia, confusion, respiratory depression <16/min, oliguria
		Interactions	Nifedipine, quinine
		Remarks	If overdose, stop Mg and then give calcium gluconate
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Marcaine Spinal (Bupivacaine Hydrochloride) **vial 0.5%**	S*	**Indication**	Intrathecal (subarachnoid) spinal anaesthesia for surgery
		Dosage	For *intrathecal injection*: Child: 0.25-0.50mg/kg; Adult: 10-20mg.
		Contraindication	Allergy; contraindications of Intrathecal anaesthesia,
		Side-Effects	Hypotension, bradycardia, nausea, postdural puncture headache, urinary retention or incontinence, paraesthesia
		Interactions	
		Remarks	Urological & lower limb surgery lasting 2–3 h, abdominal surgery lasting 45–60 min.

DRUG NAME	MTC	DRUG INFORMATION	
Measles/Mumps/ Rubella vaccine (MMR) 5ml ***Cold Chain*** Storage 2-8°C	E	**Indication**	Prevention of measles, mumps and rubella
		Dosage	0.5ml IM 9 mths and 2 ½ yrs. There are different vaccine schedules, *refer to national vaccine schedules* or package insert.
		Contraindication	Previous severe reaction, postpone if fever >38°C, severe immunosuppression
		Side-Effects	Local skin reaction, fever, rash, rarely anaphylaxis
		Interactions	
		Remarks	Live attenuated vaccine
		Pregnancy	*Avoid*
		Breastfeeding	*No contraindication*
Mebendazole **tab 100mg** **tab 500mg** *antihelminthic*	E	**Indication**	Worm: ascariasis, trichuriasis, hookworm, enterobiasis, trichinellosis
		Dosage	if >6m/<10kg: 50mg BID 3 days; Child >1yr/Adult: 100mg BID 3 days or 500mg stat.
		Contraindication	Pregnancy first trimester, children <6m
		Side-Effects	GI disturbance, headache dizziness
		Interactions	
		Remarks	Take between meals
		Pregnancy	*Avoid 1st trimester*
		Breastfeeding	*No contraindication*
Mefenamic Acid **tab 250mg** *NSAID*	E*	**Indication**	Mild pain, dysmenorrhea especially pain and heavy bleeding
		Dosage	PO 250-500mg TID Take with meal
		Contraindication	Child <12yrs, renal or hepatic impairment, severe malnutrition, peptic ulcer, severe infection, SLE, caution with asthma, allergy to NSAIDs
		Side-Effects	Gastrointestinal disturbance, headache, allergic reaction
		Interactions	other NSAID (do not combine), anticoagulants, diuretic
		Remarks	Be careful with asthma
		Pregnancy	*Contraindication*
		Breastfeeding	*Contraindication*
Meropenem **Vial 1000mg** *Antibiotic/ carbapenem*	i	**Indication**	For severe infection with resistant bacteria (usually hospital acquired)
		Dosage	Child: 10-20mg TID; Adult: 0.5-1g TID IV infusion 15-30 min (NSS or D5%, 1g/50ml) Max 1000mg/dose
		Contraindication	
		Side-Effects	GI disturbance, headache, rash, low platelets, seizures
		Interactions	Sodium Valproate
		Remarks	For meningitis use double dose
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Metformin **tab 500mg** *diabetic medication// biguanide*	E	**Indication**	Diabetes non-insulin dependent or not controlled by well followed diet or In addition to insulin
		Dosage	Start 500mg OD for 1 week and titrate up to 1g BID by weekly increases.
		Contraindication	Abnormal kidney functions, heart failure, alcoholism, radioactive contrast
		Side-Effects	GI disturbance especially diarrhoea, lactic acidosis, vit B12 malabsorption (B12 deficiency seen in 1:14 patients)
		Interactions	Alcohol, cimetidine, propranolol, steroids, hydrochlorothiazide, furosemide, contraceptive pill.
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Methyldopa **tab 250mg** *antihypertensive (centrally acting)*	E	**Indication**	Hypertension especially during pregnancy
		Dosage	Starting dose Adults: 250mg TID; Max 3g daily; Old people: 125mg BID; Max 2g daily
		Contraindication	Depression, active liver disease
		Side-Effects	Orthostatic hypotension, nausea, stomatitis, dry mouth, oedema, sedation, headaches, nightmares, jaundice, anaemia, bone marrow depression
		Interactions	Propranolol, alcohol, NSAIDs, oral contraceptive pill, iron, steroids
		Remarks	Not for emergency treatment of high BP because takes 2 days before works
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Metoclopramide **amp 10mg** **tab 10mg** *anti-emetic (anti-sickness)*	E	**Indication**	Nausea and vomiting
		Dosage	PO/IV Child: 0.12mg/kg TID; Adult: 10mg TID; Max duration: 12 weeks
		Contraindication	GI haemorrhage, perforation or obstruction
		Side-Effects	Tremor, abnormal movements, restlessness, drowsiness
		Interactions	Levodopa (do not use together), avoid use with other sedative drugs
		Remarks	Use cautiously in children and old people. Reduce dose by half if severe renal
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Metronidazole **Syrup** **tab 200mg** **vial 500mg** *antibiotic/ antiprotozoal*	E	**Indication**	*See MTC antibiotic guideline.* Infection due to anaerobic bacteria, amoebiasis, giardiasis, trichomoniasis and bacterial vaginitis
		Dosage	PO/IV Child: 7.5mg BID if <1month old, TID if >1month old Adult: 400-800mg TID for 5-10 days (dose depends on diagnosis, change IV to PO as soon as possible); For *trichomoniasis* and *bacterial vaginitis*: 2g STAT Max dose: oral 2250mg/day, IV 1500mg/day
		Contraindication	Hypersensitivity to the drug
		Side-Effects	Unpleasant taste, GI disturbance, headache, jaundice.
		Interactions	Alcohol (do not use), phenytoin, oral anticoagulant,
		Remarks	Be careful with liver failure; always give PO if possible (IV & PO are as effective)
		Pregnancy	*Possible to use*
		Breastfeeding	*Avoid prolonged use*
Miconazole/ ketoconazole Cream *antifungal*	i	**Indication**	Cutaneous candidiasis, candida balanitis, mild dermatophyte infection
		Dosage	Apply BID, sparingly, on clean and dry skin, treat for 1-4 weeks
		Contraindication	
		Side-Effects	Local irritation
		Interactions	Can damage the latex in condoms (protection no longer guaranteed)
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Misoprostol **tab 200mcg**	C	**Indication**	Induction of labour, cervical dilatation before aspiration or curettage, treatment of post-partum haemorrhage (PPH), incomplete abortion in the first trimester
		Dosage	*(refer to MTC protocol/obstetric guidelines and SMRU obstetric guidelines)*
		Contraindication	
		Side-Effects	GI disorders, headache, dizziness, fever chills, uterine hypertonia, uterine rupture, foetal distress
		Interactions	
		Remarks	Do not administer simultaneously with oxytocin; Monitor very closely FHS
		Pregnancy	*Can use during delivery*
		Breastfeeding	*No contraindication*
MOM (Milk of Magnesium) **syrup 240ml**	S	**Indication**	Gastritis, constipation
		Dosage	*For constipation:* Child: 5-15ml; Adult: 30-60ml at night at night *For gastritis:* Adult; 5-15ml QID (400mg/5ml)
		Contraindication	Renal failure, peritonitis, intestinal obstruction, severe heart disease
		Side-Effects	Abdominal cramps, diarrhoea, hypotension, muscle weakness
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Morphine *opioid*	i	**Indication**	Short course for severe pain
		Dosage	No standard dose: start at 10mg BID and slowly titrate up over days
		Contraindication	Severe respiratory impairment, nausea, constipation, urine retention, confusion
		Side-Effects	Withdrawal symptoms, sedation, nausea, constipation
		Interactions	Alcohol, benzodiazepines, neuroleptics, antihistamines
		Remarks	Narcotic, easily addictive, do not use for chronic pain unless terminal illness
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Multivitamin **syrup 60ml** **tab**	E*	**Indication**	Vitamin supplementation to prevent some deficiencies in people at risk (pregnant women, malnourished persons)
		Dosage	Child <5yr: 1 tab/day; Child >5yr: 2tab/day; Adult: 3tab/day.
		Contraindication	
		Side-Effects	
		Interactions	
		Remarks	Vit A 2,500 IU, vit D 300 IU, vit B1 1mg, vit B2 0.5mg, vit B3 7.5mg, vit C 15mg
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Niclosamide **tab 500mg** anti-helminthic	E	**Indication**	Tapeworm
		Dosage	Child <10kg: 500mg STAT; 11-35kg: 1g STAT; Adult: 2g STAT.
		Contraindication	
		Side-Effects	Vomiting – *consider metoclopramide 10mg STAT prophylaxis,* dizziness, itchy skin
		Interactions	
		Remarks	Chew tablets before swallowing. Not effective for cysticercosis
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Nifedipine **tab 10mg** *antihypertensive - calcium channel blocker*	E	**Indication**	Hypertension – useful in malignant hypertension and in pregnancy, Threatened premature labour (tocolytic), Raynauds syndrome, acute ischaemia in digits. Primary pulmonary hypertension
		Dosage	*HTN in pregnancy*: 10-50mg BID; *Premature labour:* 20mg TID
		Contraindication	Severe cardiac disease or post myocardial infarction, systolic <90mmHg, magnesium or salbutamol
		Side-Effects	Headache, flushing, peripheral oedema, hypotension, tachycardia,
		Interactions	Cimetidine, phenytoin, rifampicin, betablockers, grapefruit
		Remarks	Be careful BP drop abruptly (too fast), do not give as long term treatment (better to use amlodipine longer term)
		Pregnancy	*Contraindicated during 1st trimester*
		Breastfeeding	*Avoid*
Nitrofurantoin **tab 100mg** *antibiotic*	E	**Indication**	UTI
		Dosage	Child >3mths: 1.5mg/kg QID; Adult: 50-100mg QID; Take with meal
		Contraindication	G6PD deficiency, last weeks of pregnancy.
		Side-Effects	GI disturbance
		Interactions	
		Remarks	G6PD test need to be done prior to use
		Pregnancy	*Not last weeks of pregnancy*
		Breastfeeding	*Avoid*
Nystatin 100000 IU oral / vaginal *antifungal*	E	**Indication**	Oral candida, vaginal candida
		Dosage	Oral: 100,000 IU QID (up to 500,000 IU QID *if immune-compromised e.g. HIV*) Vaginal: 100,000 IU OD at night – insert high in vagina
		Contraindication	
		Side-Effects	
		Interactions	
		Remarks	Take at least 30 mins before eating
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Omeprazole **tab 20mg** *proton pump inhibitor (PPI)*	E	**Indication**	1st line of complicated peptic ulcer (perforation, haemorrhage), for healing and preventing recurrence 2nd line for gastro-oesophageal reflux and benign peptic ulcer
		Dosage	*Complicated peptic ulcer:* 20mg BID *GERD:* 20mg OD for 4 weeks *Benign peptic ulcer:* 20mg OD for 7-10 days *Helicobacter pylori eradication (in combination with antibiotics):* 20mg BID
		Contraindication	
		Side-Effects	Headache, diarrhoea, skin rash, dizziness, abdominal pain
		Interactions	Warfarin, digoxin, phenytoin, itraconazole
		Remarks	Omeprazole may be introduced in IPD
		Pregnancy	*Avoid 1st trimester*
		Breastfeeding	*Not recommended*
Oral polio vaccine (OPV) **2ml** ***Cold Chain*** Storage 2-8°C	E	**Indication**	Prevention of poliomyelitis
		Dosage	2-3 drops PO at 6 weeks, 12 weeks, 18 weeks, 18 mths, and 5yrs. There are different vaccine schedules, *refer to national vaccine schedules* or package insert.
		Contraindication	Postpone if fever >38°C
		Side-Effects	
		Interactions	
		Remarks	If child has diarrhoea at time of vaccination give dose and repeat again after 4 weeks. Booster doses given in yearly Polio campaign
		Pregnancy	*NA*
		Breastfeeding	*NA*

DRUG NAME	MTC	DRUG INFORMATION	
ORS **Oral**	E	**Indication**	Prevention and treatment of dehydration to replace fluid and electrolyte loss from acute diarrhoea, cholera
		Dosage	*Prevention of dehydration:* WHO plan A *Treatment of moderate dehydration:* WHO plan B *Treatment of severe dehydration:* WHO plan C, in combination with IV therapy According to loss, usually 200-400ml after every loss motion
		Contraindication	Unable to tolerate oral liquid
		Side-Effects	Eyelids become puffy: stop ORS, give plain water
		Interactions	
		Remarks	Use one ORS powder sachet and mix it with clean boiled water (cooled) Read the directions on the sachet to see how much water to add
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

Oxytocin **vial 10IU/ml** Storage 2-8°C	E	**Indication**	Incomplete abortion, prevention and treatment of post-partum haemorrhage (PPH), induction of labour
		Dosage	*(refer to MTC protocol/SMRU obstetric guidelines)*
		Contraindication	Do not use for induction if previous c/s, foetal distress
		Side-Effects	GI disturbance, palpitations, anti-diuretic effect in large doses
		Interactions	Do not use less than 6 hours after misoprostol
		Remarks	Monitor closely for foetal distress (contraction and FHS)
		Pregnancy	*Can use during delivery*
		Breastfeeding	*No contraindication*

Paracetamol= acetaminophen **tab 500mg** **Syrup** **amp 300mg**	E	**Indication**	Mild pain, fever
		Dosage	PO: Child: 15mg/kg QID (max 2g/day); Adult: 500mg-1g QID (mg 4g/day) IM: Child: 10mg/kg QID; Adult: 300mg QID
		Contraindication	Caution with hepatic impairment. Reduce dose by half
		Side-Effects	Liver damage if over dosage
		Interactions	
		Remarks	No anti-inflammatory properties
		Pregnancy	*No contraindication*
		Breastfeeding	*No Contraindication*

Penicillin V phenoxymethylpenicillin **Syrup** **tab 250mg** *antibiotic - penicillin*	E	**Indication**	*See MTC antibiotic guideline.* Streptococcal tonsillitis, dental infection. prophylaxis after splenectomy and specific situation
		Dosage	Child: 7.5-15mg/kg QID; Adult: 250-500mg QID, 1g BID dose is equally effective; *Prophylaxis*: 500mg BID
		Contraindication	Penicillin allergy, be careful if cephalosporin allergy
		Side-Effects	kidney failure
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Permethrin cream 30g tube	I	**Indication**	2nd line for scabies treatment
		Dosage	Child >2 months - 1 year: 1/8 tube (=3.75g) apply over whole body including the neck, face, ears and scalp Child 1-5 years: 1/4 tube (=7.5g) apply over whole body including the neck, face, ears and scalp. If >2 years old do not apply to the neck, face, ears, and scalp. Child 6-12 years: 1/2 tube (=15g) and patient >12 years: 1 tube (=30g) apply to whole body but not neck, face, ears and scalp Wash off cream after 8-12 hours The cream is a 'vanishing' cream so will not be visible after application.
		Contraindication	Allergy to ingredients
		Side-Effects	Itching, erythema
		Interactions	
		Remarks	treat all family members at the same time. wash clothes and bedding
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Phenobarbital =phenobarbitone **tab 30mg** **tab 60mg** **vial 200mg/ml**	C	**Indication**	Epilepsy (*long term treatment*), generalized convulsions (if diazepam cannot control) 1st line for neonatal convulsion
		Dosage	PO: Child: initial 3mg/kg HS (max 8mg/kg); Adult: 60mg HS (max 180mg). IV: Child/Neonate: 10-20mg/kg over 30 min; Adult: 10mg/kg over 30 min.
		Contraindication	Severe respiratory depression
		Side-Effects	Drowsiness, confusion, hypotension, rash, blood disorders, respiratory depression and arrest
		Interactions	Doxycycline, metronidazole, steroid, COC
		Remarks	For neonatal dose *see SMRU neonatal guidelines*
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Phenytoin 50mg/ml **vial 50mg/ml** **tab 100mg**	C	**Indication**	Epilepsy (long term treatment), generalized convulsions (if diazepam cannot control) 2nd line for neonatal convulsion
		Dosage	PO (in 2-3 doses): Child: 3-8mg/kg/day (max 300mg/day); Adult: 200mg/day (max 500mg/day). IV infusion – For Neonate: 20mg/kg over 30 min Child/Adult: dilute with NSS: 15mg/kg over 1 hour Monitor very closely, risk of low BP, slow HR, respiratory depression
		Contraindication	Bradycardia
		Side-Effects	Confusion, dizziness, headache, tremor, insomnia, depression, swollen gums, anaemia
		Interactions	Aspirin, cotrimoxazole, metronidazole, isoniazide, cimetidine, doxycycline, steroids, COC
		Remarks	Never dilute with dextrose; If long term use, administer folic acid.
		Pregnancy	*Avoid*
		Breastfeeding	*Avoid*
Podophylline 15-25% **liquid 100ml**	E	**Indication**	External genital, vaginal and perianal warts
		Dosage	Apply once to area – *see remark*. Leave for 1-4 hours then wash with soap and water
		Contraindication	Do not use for children. Do not apply to healthy skin, warts >3cm, cervical, oral, urethral
		Side-Effects	Local reaction, pain, ulceration. GI disturbance.
		Interactions	
		Remarks	Apply protective layer of vaseline to surrounding skin. Apply by healthworker
		Pregnancy	*Do not use*
		Breastfeeding	*Do not use*

DRUG NAME	MTC	DRUG INFORMATION	
Potassium chloride **tab 500mg**	E	**Indication**	Low potassium, maybe secondary to diuretics; to make ORS
		Dosage	Adult: 500mg-1.5g TID depending on potassium result
		Contraindication	Do not combine with spironolactone, be very careful if you must use in patients with kidney failure.
		Side-Effects	GI disturbance, ulceration (to avoid take at the end of the meal)
		Interactions	
		Remarks	Advise patient to alternatively eat plenty of fruit
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Praziquantel **tab 600mg** *anti-helminthic*	E	**Indication**	Tapeworm, paragonimus (fluke worm)
		Dosage	*Taenia (tapeworm):* 20mg/kg STAT; *Paragonimus:* 25mg/kg TID for 3 days
		Contraindication	Ocular cysticercosis
		Side-Effects	Drowsiness, headache, GI disturbances, dizziness,
		Interactions	
		Remarks	*See BBG*
		Pregnancy	*Do not use 1st trimester*
		Breastfeeding	*No contraindication*
Prednisolone =prednisone **tab 5mg** *steroid*	E	**Indication**	Allergic & inflammatory diseases/reactions (asthma, COPD,, nephrotic syndrome, rheumatoid arthritis)
		Dosage ***(with food)***	Child: 1-2mg/kg OD; Adult: 0.5-1.5mg/kg OD; *Duration vary according to indication and clinical response*
		Contraindication	Peptic ulcer, uncontrolled bacterial/parasitic infection, acute viral infection
		Side-Effects	If prolonged treatment: fluid retention, increase susceptibility to infection, growth retardation
		Interactions	
		Remarks	Give deworming If treatment longer than 10 days, decrease dose gradually Prednisolone 5mg ⇔ dexamethasone 0.75mg ⇔ hydrocortisone 20mg
		Pregnancy	*No contraindication, for short period*
		Breastfeeding	*No contraindication, take after feed*
Primaquine **tab 15mg** **tab 5mg** **tab 7.5mg** *antiparasite - antimalarial*	E*	**Indication**	Malaria – Decrease transmission, anti-relapse for *P. vivax* and *P. ovale (refer to SMRU malaria guidelines)*
		Dosage	*P. vivax, P. ovale:* 0.5mg/kg OD for 14 days *If G6PD deficiency*: 0.75mg/kg once a week for 8 weeks *P. falciparum, P. malariae:* 0.25mg/kg STAT (*no need for G6PD test*)
		Contraindication	Infant <6 mths, Hb <6g/dl, rheumatoid arthritis, G6PD deficiency
		Side-Effects	Vomiting, loss of appetite, abdominal pain
		Interactions	
		Remarks	Be careful with G6PD, give the correct dose if G6PD deficient
		Pregnancy	*Contraindication*
		Breastfeeding	*Do not use if baby <1 mths (see Gilder et al, 2018)*
Procaine penicillin G **vial 3M IU/10ml** *antibiotic - penicillin*	S	**Indication**	Neurosyphilis
		Dosage	Deep IM: Child: 25-50mg/kg OD or BID; Adult: 600mg-2.4g OD or BID x 7-14 days
		Contraindication	Penicillin allergy, be careful if cephalosporin allergy
		Side-Effects	pain at injection site, kidney failure
		Interactions	
		Remarks	100.000UI=100mg; Be Careful not to give IV Is effective for many infections but not as 1st line
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Propranolol **tab 10mg** **tab 40mg** *beta blocker*	E	**Indication**	Hypertension, angina/MI, arrhythmia, thyrotoxicosis, anxiety with palpitations, tremor, migraine prophylaxis
		Dosage	*HTN:* 40mg BID; max 160mg BID *Angina/MI:* 40mg BID or TID; 120mg BID *Arrhythmias/thyrotoxicosis:* 10-40mg TID / QID *Anxiety/palpitation:* 40mg OD; 40mg TID
		Contraindication	Asthma, COPD, bradycardia, hypotension,
		Side-Effects	Bradycardia, hypotension, heart failure, bronchospasm, sleep disturbance, cold hands and feet
		Interactions	Aminophylline, NSAIDs, rifampicin, steroids, contraceptive pill, anti-diabetic drugs
		Remarks	*Beta blockers may cause IUGR*
		Pregnancy	*No contraindication; monitor newborn glucose*
		Breastfeeding	*Avoid*
PTU (propylthiouracil) **tab 50mg**	E	**Indication**	Hyperthyroidism
		Dosage	Adult: 50-150mg TID initially and then reduce as per guideline (*refer to MTC/BBG protocol*)
		Contraindication	Hypothyroidism
		Side-Effects	GI disturbance, rarely bone marrow depression
		Interactions	
		Remarks	Once TSH is normal reduce dose – e.g. 50-150mg OD *If taken during pregnancy, risk of neonatal goitre and hypothyroidism: check TFTs*
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Pyrantel (combantrin) **125mg/5ml** *anti-helminthic*	E	**Indication**	Worm infection: ascariasis (roundworm), enterobiasis (pinworm), trichinellosis, ancylostomiasis (hookworm)
		Dosage	10mg/kg STAT dose (*for severe infection or trichinellosis continue 4-5 days*)
		Contraindication	
		Side-Effects	Headache, GI disturbance
		Interactions	
		Remarks	Better to give mebendazole or albendazole if no contraindication
		Pregnancy	*Avoid in 1st trimester*
		Breastfeeding	*No contraindication*
Pyrazinamide (Z) **tab 400mg** HRZE H 75mg, R 150mg, Z 400mg, E 275mg Antibiotic - Anti-TB	i	**Indication**	TB (in combination with other anti-TB drugs)
		Dosage	Z Child: 20-30mg/kg OD; Adult: <50kg: 1.5g OD; >50kg: 2g OD; HRZE Weight based dose: 20-34kg: 2tab; 35-39kg: 2.5tab; 40-54kg: 3tab; 55-70kg: 4tab; >70kg: 5tab
		Contraindication	Jaundice/severe hepatic impairment, severe gout
		Side-Effects	Hepatitis, rash, joint pain, GI disturbance
		Interactions	
		Remarks	
		Pregnancy	*Avoid in 1st trimester*
		Breastfeeding	*No contraindication*
Pyridoxine vit B6 **tab 10mg**	E	**Indication**	Prevention and treatment of peripheral neuropathy (especially 2nd to isoniazid)
		Dosage	*Prevention:* Child <5kg: 5mg OD; Child/adult >5 kg: 10mg OD *Treatment:* Adult: 50mg TID; Child: 50mg OD
		Contraindication	
		Side-Effects	GI disturbance, dizziness
		Interactions	
		Remarks	Always give if INH treatment
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Quinine **amp 600mg/2ml** **tab 300mg** *antiparasite - antimalarial*	E	**Indication**	Malaria – *P. falciparum (refer to SMRU malaria guidelines)*
		Dosage	IV *loading dose* 20mg/kg IV *infusion* over 4 hours dilute in 250ml of D5W/D10W (for children <20kg dilute in 10ml/kg). Then 10mg/kg IV infusion TID PO: 10mg/kg TID for 7 days
		Contraindication	
		Side-Effects	Hypoglycaemia, visual and hearing problems, cardiac disorders
		Interactions	Chloroquine, mefloquine, co-arthemer
		Remarks	Monitor blood glucose closely IM injection should be deep into anterior thigh **Always use in combination with other anti-malarial drug**
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Rabies immunoglobulin ***Cold Chain*** Storage 2-8°C	i	**Indication**	Post exposure prophylaxis against rabies infection (available at MSH or Mae sot Ram– self referral)
		Dosage	20 units/kg infiltrated in and around wound or IM anterolateral thigh.
		Contraindication	
		Side-Effects	Local swelling at site of injection, rarely anaphylaxis
		Interactions	
		Remarks	Give with rabies vaccine, but not at same site
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Rabies vaccine ***Cold Chain*** Storage 2-8°C	i	**Indication**	Prevention of rabies (available at MSH – self referral)
		Dosage	***Pre exposure vaccine schedule*** - There are different dosing regimens and injection (IM or SC) instructions, *refer to package insert.* ***Post exposure prophylaxis (PEP)*: Day 0**: 2 doses (1 in each arm or thigh); **Day 7**: 1 dose; **Day 21**: 1 dose
		Contraindication	
		Side-Effects	Local skin reaction, fever, rarely anaphylaxis
		Interactions	
		Remarks	Refer to *SMRU medical guidelines* for more information on vaccine administration
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Red blood cell (Unmixed) *Or* **Mixed blood**	E	**Indication**	Symptomatic anaemia, acute bleeding with shock and/or severe thrombocytopaenia
		Dosage	Child <1yr: 15cc/kg; Child >1yr: 20cc/kg; Severely malnourished child: 10cc/kg Adult: 1-2 bags (1 bag = 350-450cc)
		Contraindication	
		Side-Effects	Transfusion reaction – haemolysis, pulmonary oedema, allergic reaction – urticarial, anaphylaxis
		Interactions	
		Remarks	Safety of blood: check HIV, HCV, HBV, malaria, Hb, G6PD (if available) Ensure donor and patient blood group is compatible Follow blood transfusion protocol for administration
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Rifampicin (R) **Tab 150mg 300mg** HRZE H 75mg, R 150mg, Z 400mg, E 275mg HR H 150mg- R 300mg *antibiotic - anti-tb*	i	**Indication**	TB (in combination), leprosy (in combination)
		Dosage	***R Tuberculosis:*** Child <30kg: 15mg/kg; Child >30kg/Adult: 10mg/kg, on empty stomach max 600mg/day; *duration according to protocol* HRZE Weight based dose: 20-34kg: 2tab; 35-39kg: 2.5tab; 40-54kg: 3tab; 55-70kg: 4tab; >70kg: 5tab HR Weight based dose: 21-54kg: 1tab; 55-70kg: 2tab; >70kg: 2.5tab ***Leprosy:*** (1/month) Child <10y: 12-15mg/kg; Child 10-14y: 450mg; Adult: 600mg
		Contraindication	Jaundice, severe haematological disorder, Be careful if liver failure
		Side-Effects	Orange-red discoloration of body secretion (urine, tears), GI disturbance, drowsiness, influenza-like, thrombocytopenia, hepatotoxicity
		Interactions	Reduces effect of many drugs+++ including hormonal treatment e.g. COC
		Remarks	If patient takes ARV, need to give Rifabutin instead of rifampicin *Give vit K prevention in late pregnancy and neonate*
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Salbutamol (= albuterol) Inhaler **tab 2mg** **Syrup** *bronchodilator*	E	**Indication**	Symptomatic treatment of asthma attack (nebulization and inhaler) Treatment of persistent asthma not controlled by inhaled steroid (tablet)
		Dosage	*Dose and presentation depend on the severity* *Inhaler:* 2-4 puffs (up to 10 puffs) every 10-30 minutes if needed (up to every 6 hours if outpatient) *Nebulisation:* 2.5mg-5mg (with NSS up to 4ml) during 10-15min, every 20-30 minutes if necessary *Tablet:* Child 2-6y: 3-6mg/day; 6-12y: 6mg/day; Child >12yrs/Adult: 6-12mg/day
		Contraindication	For tab: be careful for diabetes, hyperthyroidism, arrhythmia, angina, hypertension
		Side-Effects	Headache, tremor, tachycardia
		Interactions	Methyldopa (acute hypotension)
		Remarks	Do education for the proper use of inhaler, if needed, use a spacer Tablet only if administration of inhaler is not possible or not available Tab not indicated for acute asthma attack since its onset of action is within 30 min
		Pregnancy	*No contraindication*
		Indication	Symptomatic treatment of asthma attack (nebulization and inhaler) Treatment of persistent asthma not controlled by inhaled steroid (tablet)
Sildenafil **tab 25mg** **tab 50mg** **tab 100mg** *vasodilation*	i	**Indication**	Acute ischaemia in fingers or toes mainly in patients with collagen vascular disorder (eg SLE, scleroderma) or vasospastic disorder (eg severe Raynauds syndrome. Pulmonary arterial hypertension. Erectile dysfunction/impotence
		Dosage	***Acute ischaemia*** *(off label)*: 25mg BID - TID until ischaemia resolves. ***Pulmonary Arterial Hypertension***: Adult >17 years: 20mg TID ***Erectile dysfunction***: 50mg -100mg take 1 hour before sexual activity. Max 100mg/day
		Contraindication	Unexplained blindness in one eye, severe liver disease, BP <90/50, recent stroke or heart attack,
		Side-Effects	Headache, flushing, dyspepsia, nasal congestion, dizziness, nausea, blurred vision
		Interactions	Glyceryl Trinitrate spray or nitroglycerin tablets (used for angina), isosorbide mono/dinitrate (all nitrates). Decrease dose if on protease inhibitors (ART)
		Remarks	Check G6PD test
		Pregnancy	*Contraindicated*
		Breastfeeding	*Contraindicated*

DRUG NAME	MTC	DRUG INFORMATION	
Silver Sulphadiazine **450mg** *antibacterial*	E	**Indication**	Prophylaxis and treatment of infections of burns Treatment of infections of leg ulcers and bed sores
		Dosage	Apply a 3-5mm layer on the clean wound OD, and cover with sterile compresses
		Contraindication	Infant <1month, monitor for haemolysis in G6PD deficiency
		Side-Effects	Skin reaction; if applied to large burn - systemic absorption, can cause haemolysis in G6PD deficiency
		Interactions	
		Remarks	Check G6PD test
		Pregnancy	*Avoid during last month*
		Breastfeeding	*No contraindication*
Simvastatin *statin – cholesterol lowering*	i	**Indication**	High level of LDL cholesterol, for patient with high risk of cardiovascular disease (eg hypertensives/diabetics/smokers or after having a heart attack or stroke (to prevent another one)
		Dosage	Adult: ideally 40mg at night if available, otherwise 20mg at night
		Contraindication	Liver disease, transaminase elevated, myopathy, kidney failure
		Side-Effects	GI disturbance, muscle pain, headache, neuropathy, tendinitis, high transaminases, bad dreams
		Interactions	Grapefruit, amlodipine (max dose simvistastin 20mg if prescribed together)
		Remarks	
		Pregnancy	*Contraindicated*
		Breastfeeding	*Contraindicated*
Sodium Valproate **tab 200mg** *anti-epileptic*	C	**Indication**	Epilepsy (not 1st line for women of reproductive age)
		Dosage	Child: 5mg/kg BID or TID; increase until optimal dose (usually 20-30mg/kg/day); Adult: 200mg TID
		Contraindication	Liver active disease, pancreatitis
		Side-Effects	dyspepsia, nausea, ataxia, weight gain, low platelets, oedema, liver toxicity, sedation, confusion
		Interactions	Aspirin, chloroquine, mefloquine, tricyclic antidepressant
		Remarks	If possible, monitor LFT and TP during the first 3-6mths of treatment
		Pregnancy	*Don't start during 1st trimester*
		Breastfeeding	*No contraindication*
Spironolactone **tab 25mg** *potassium sparing diuretic*	E	**Indication**	Oedema due to congestive heart failure, nephrotic syndrome, liver cirrhosis
		Dosage	*Nephrotic syndrome:* Child/Adult: 3mg/kg OD *Ascites:* 100-200mg OD, Max 400mg *Heart failure:* 25mg OD
		Contraindication	High potassium, pregnancy and breastfeeding,
		Side-Effects	Nausea, impotence, gynaecomastia, menstrual irregularities, lethargy, headache, increased potassium
		Interactions	Indomethacin, aspirin, COC, digoxin, potassium.
		Remarks	Use with caution old people, renal and liver disease
		Pregnancy	*Do Not Use*
		Breastfeeding	*Do Not Use*
Streptomycin (S) *antibiotic - aminoglycosides - anti-TB*	i	**Indication**	TB (in combination with other anti-TB drugs)
		Dosage **IM injection OD**	Child: 15mg/kg; Adult: <45yrs to >50kg: 1g OD, <50kg: 750mg OD; 45-60yrs to >37kg: 750mg OD, <37kg: 500mg OD; >60yrs: 500mg OD
		Contraindication	Allergy to aminoglycoside antibiotics
		Side-Effects	Deafness, renal impairment, skin rash
		Interactions	Do not give with furosemide (increases risk of deafness)
		Remarks	Do not give IV
		Pregnancy	*Contraindicated*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Tenofovir **tab 300mg** *antiretroviral - NRTI*	S	**Indication**	HIV – in combination with other antiretrovirals Chronic hepatitis B – only for staff enrolled in treatment programme
		Dosage	Child 4–9kg: 12mg/kg BID; 9–30kg: 9mg/kg BID Adult/Child >30 kg: 250–300mg BID
		Contraindication	
		Side-Effects	GI disturbance, liver/pancreatic/renal disorder, low phosphate
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*Refer to protocol*
Tetanus immunoglobulin ***Cold Chain*** Storage 2-8°C	i	**Indication**	Post exposure prophylaxis against tetanus infection, treatment of tetanus. *Patient needs urgent referral to MSH to receive tetanus treatment.*
		Dosage	**Post exposure prophylaxis**: Child and adult: 250 IU IM; 500 IU if >24 hours since injury *Treatment*: 500 IU as single dose given in 2 different sites.
		Contraindication	
		Side-Effects	Local swelling at site of injection, rarely anaphylaxis
		Interactions	
		Remarks	Give with tetanus vaccine but not at same site
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Tetracaine 0.5% eye drop	E	**Indication**	Local anaesthesia for eye surgery
		Dosage	
		Contraindication	Allergy to tetracaine
		Side-Effects	Allergy, corneal lesion if repeated /prolonged use
		Interactions	
		Remarks	Onset 25sec; duration 15min
		Pregnancy	*If possible, do not use*
		Breastfeeding	*If possible, do not use*
Tetracyline TEO Eye ointment	E	**Indication**	Conjunctivitis, neonatal prophylaxis, trachoma
		Dosage	*Conjunctivitis:* QID for 1 week; *Trachoma:* QID for 6 weeks *Neonate:* single dose immediately after birth
		Contraindication	Tetracycline allergy
		Side-Effects	
		Interactions	
		Remarks	For trachoma – single dose azithromycin can be used in place of 6 week TEO
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Theophylline **Tab** **syrup 60ml**	i	**Indication**	Prevention of apnoea of prematurity 2nd line treatment to consider in severe persistent asthma
		Dosage	Neonate <1.6kg or <34 weeks gest: *Loading dose* 5 to 6mg/kg, and then 2 to 6mg/kg/day until >1.6kg
		Contraindication	
		Side-Effects	*Tachycardia, vomiting, feeding intolerance, jitteriness and seizures.*
		Interactions	
		Remarks	1st line if possible (golden standard: caffeine)
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Thyroxine **tab 100mcg**	E	**Indication**	Hypothyroidism
		Dosage	Start: 0.1mg OD 1 month, then 0.15mg OD 1 month, (*refer to MTC/BBG protocol*)
		Contraindication	Be careful with Cardiac disease, but to treat may be compulsory
		Side-Effects	Hyperthyroidism symptoms
		Interactions	Warfarin, ferrous sulfate, oestrogen
		Remarks	Take morning fasting; Check TSH after4-6 weeks / reduce dose if >65yrs
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Tramadol **tab 50mg** **amp 100mg** **amp 50mg**	C	**Indication**	Moderate acute pain, moderate to severe chronic pain, neuropathic pain
		Dosage	Child >6mths: 2mg/kg QID; Adult: 50-100mg QID
		Contraindication	Severe respiratory depression, patient with risk of seizure (epilepsy, head injury, meningitis), be careful with severe renal or liver disease
		Side-Effects	Dizziness, nausea, drowsiness, allergic reaction, withdrawal symptoms, headache, hypotension, constipation. addiction
		Interactions	Any psychotropic drug
		Remarks	Maximum dose: 400 mg in 24 hours
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Valacyclovir **tab** *antiviral*	i	**Indication**	Herpes encephalitis
		Dosage	1g TID
		Contraindication	
		Side-Effects	GI disturbance, headache, rash, tiredness, photosensitivity
		Interactions	
		Remarks	More likely to reach therapeutic levels in CNS than acyclovir orally.
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Vitamin A (retinol) **tab 25 000 IU** **tab 200 000 IU**	E	**Indication**	Prevention and treatment of vitamin A deficiency (xerophthalmia)
		Dosage	*Prevention STAT:* Child <6mo: 50000IU; 6-12mo: 100000IU; Child >1yr: 200000IU *Treatment OD on **Days 1-2-8**:* Child <6mo: 50000IU; 6-12mo: 100000IU; Child >1yr: 200000IU
		Contraindication	
		Side-Effects	Overdose: GI disturbance, headache, raised intracranial pressure.
		Interactions	
		Remarks	Administer routinely 2 doses to children suffering from measles and other (pneumonia, diarrhoea, malaria)
		Pregnancy	*Adapt dose because can cause birth defects*
		Breastfeeding	*No contraindication*
Vitamin B Complex Tab	E*	**Indication**	Alcohol withdrawal, vitamin B deficiency
		Dosage	Child <5yr: 1 tab/day; Child >5yr: 2tab/day; Adult: 3tab/day (SMRU protocol = 2 tab BID)
		Contraindication	
		Side-Effects	
		Interactions	
		Remarks	Vit B1 100mg, vit B6 5mg, vit B12 50mcg / vit B1 1mg, vit B6 1mg vit B3 15mg
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
Vitamin B1 (thiamine) **tab 100mg** **tab 10mg** **vial 100mg/ml** **Store in airtight non-metallic container**	E	**Indication**	Vitamin B1 deficiency: beri beri, alcoholic neuritis, Wernicke's encephalopathy Prevention during pregnancy
		Dosage	*Wernicke's encephalopathy:* 500mg IV TID for 2 days and then 5 days of 250mg thiamine IM OD, followed by 100mg PO OD *Severe deficiency:* 100mg IM TID 1 day, then 100mg PO OD 7 days, then 10mg OD for 6 weeks *Mild deficiency:* 100mg OD 7 days, then 10mg OD for 6 weeks *During pregnancy:* 100mg OD
		Contraindication	
		Side-Effects	
		Interactions	Betel nut destroys vit B1
		Remarks	Combine with multivitamin or B complex
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

Vitamin B12 (=cobalamin) **tab 100mcg** **vial 1mg**	E	**Indication**	Vitamin B12 deficiency such as megaloblastic anaemia, Biermer disease, gastrectomy
		Dosage	IM: 1mg 3 times per week during 2 weeks, then 1mg IM/1-3mths Alternative: PO: 1mg (10 tab) per day for 2-4 weeks
		Contraindication	Leber's disease (a hereditary eye disease), malignancy
		Side-Effects	Allergy, red urine, acnea
		Interactions	
		Remarks	Betel nut and alcohol reduce absorption
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

Vitamin K1 **vial 1mg/1ml** **vial 10mg**	E*	**Indication**	Prevention of haemorrhagic disease of newborn. Severe haemorrhage in chronic liver disease patient
		Dosage	*Neonate:* <1.5kg: 0.5mg IM; >1.5kg: 1mg IM (soon after birth) *Neonate treatment:* 1mg TID IM *Anticoagulation (e.g. warfarin) overdose:* 2.5-5mg (IV or PO) Liver disease haemorrhage: 10mg IM stat
		Contraindication	
		Side-Effects	Haematoma at IM site
		Interactions	
		Remarks	All neonates should receive on first day of life Prioritize: preterm, LBW, vacuum, forceps, mother on epileptic or TB drug
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*

Warfarin *anticoagulant*	I	**Indication**	Prevention and treatment of embolism after heart valve replacement, atrial fibrillation, rheumatic heart disease, deep venous thrombosis, pulmonary embolism
		Dosage	Daily dose usually 3-9mg (adjusted depending on INR)
		Contraindication	Haemorrhagic stroke, bleeding, <48 hours post-partum
		Side-Effects	Bleeding, GI disturbance, jaundice, pancreatitis, fever, hair loss *If bleeding and/or INR > 5*: stop warfarin, and consider to restart once INR <5 *If INR bleeding and/or INR >8*: give Vitamin K 2.5-5mg (IV or PO)
		Interactions	Interacts with many drugs especially aspirin and many foods (e.g. cabbage)
		Remarks	Need a very close monitoring; INR – aim: 2.5-3.5 depending on indication
		Pregnancy	*Do Not use in 1st trimester*
		Breastfeeding	*No contraindication*

DRUG NAME	MTC	DRUG INFORMATION	
White paraffin Vaseline Ointment **cream 500g**	E*	**Indication**	Dry skin, protective barrier, lubrication
		Dosage	Apply topically PRN
		Contraindication	
		Side-Effects	
		Interactions	
		Remarks	
		Pregnancy	*No contraindication*
		Breastfeeding	*No contraindication*
Zinc **tab 20mg**	E	**Indication**	Acute or persistent diarrhoea in child<5yrs (in combination with ORS therapy), delayed wound healing, malnutrition, severe eczema (sometimes can be related to zinc deficiency)
		Dosage	Child <6m: 10mg OD; Child 6m-5y: 20mg OD for 14 days (as recommended by WHO) can be mixed in ORS; Adult 20-25mg OD. *For diarrhoea treatment only give to children <5 years* (no benefit to children >5 yrs)
		Contraindication	Malnourished children taking therapeutic food (F75, F100 already contains zinc)
		Side-Effects	
		Interactions	
		Remarks	To reduce the duration and severity of diarrhoea, and to prevent further occurrences in the 2-3mths after treatment
		Pregnancy	*NR*
		Breastfeeding	*NR*

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