



# Burmese Border Guidelines

**2016**



## ABOUT THESE GUIDELINES

The Burmese Border Clinical Guidelines are specifically designed to assist medics and health workers practising along the Thailand-Myanmar border. These 2016 guidelines are an adaptation and update of the 2007 *Burmese Border Clinical Guidelines* (BBG) which was produced in conjunction with a number of organisations on the Thai-Myanmar border.

The updated has been completed using resources such as Médecins Sans Frontières (MSF) 2013 '*Clinical Guidelines Diagnosis and Treatment Manual*,' and other international treatment guidelines and medical literature from the World Health Organisation (WHO) and Non-Government Organisations (NGOs).

These guidelines have been updated and approved by physicians working at Shoklo Malaria Research Unit (SMRU). Mae Tao clinic kindly contributed their pharmacy handbook which has been created using MSF 2013 '*Clinical Guidelines Diagnosis and Treatment Manual*,' and the '*British National Formulary*' (BNF) 2014. In addition, some parts of the '*Mae Tao Clinic 2015 Chronic Guidelines*' are included. There may be minor discrepancies between the pharmacy handbook and the guidelines due to slightly different practices. Please follow local protocols for your organisation if available.

Specific guidelines for malaria, obstetrics and paediatrics/neonates exist so most duplicated information has been removed from this guideline to avoid conflicting advice. For information regarding these topics, please see separate guidelines.

Where possible each chapter follows the following format: EMERGENCY CONDITIONS, DEFINITION, CAUSES, SIGNS AND SYMPTOMS, DIAGNOSIS, TREATMENT and PREVENTION. The information within each chapter may not be an extensive list but the most relevant aspects for clinics on the border are included.

The guidelines are written in simple English to allow for understanding, and the language has been checked and approved by medics at SMRU clinics.

SMRU gives permission for the reproduction and translation of these guidelines for use by other health organisations on the border. These guidelines are recommendations only, SMRU and Mae Tao clinic cannot be held responsible for the use of these guidelines by other organisations.

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Contributors to the original BBG 2007 are outlined below:

- Aide Medicale Internationale (AMI)
- American Refugee Committee (ARC)
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- Malteser International (MI)
- Medecins Sans Frontieres – France (MSF)
- Mae Tao Clinic
- Shoklo Malaria Research Unit (SMRU)
- Thailand Burma Border Consortium (TBBC)
- United Nations High Commissioner for Refugees (UNHCR)

## HOW TO USE THESE GUIDELINES

These guidelines should not replace clinical decision-making, but should help confirm a diagnosis when you already have an idea of the patient's disease. These guidelines have been adapted for use in the context of SMRU clinics on the Thai-Myanmar border, and therefore may not be fully appropriate for use elsewhere.

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 also be used to treat your patient.

1. 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.
2. **DRUG DOSAGES** are written in the text for specific conditions but more information such as contraindications and side effects can be found in the Pharmacy Handbook at the end of the BBG. If the dosage is not written in the text then please refer to the Pharmacy Handbook. Make sure you are aware of the contra-indications and warnings for each medicine.

### Abbreviations used

mg	=	Milligram
g	=	Gram
kg	=	Kilogram
ml	=	Millilitre
L	=	Litre
IU	=	International Units
MIU	=	Million International Units
cm	=	Centimetre
m	=	Metre
sec	=	Second
min	=	Minute
d	=	Day
yr	=	Year
X	=	Times
/	=	Per
Tab	=	Tablet
PO	=	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
Mmol/l	=	Millimole per litre
Mg/dl	=	Milligrams per decilitre
<	=	Less than
≤	=	Less than or equal to
=	=	Equal to
>	=	More than
≥	=	More than or equal to

**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 Immuno Deficiency Syndrome
ANC	=	Ante Natal Care
ARI	=	Acute Respiratory Infection
BC	=	Blood Culture
BP	=	Blood Pressure
CBC	=	Complete Blood Count
CRP	=	C - Reactive Protein
D5W	=	Dextrose 5% and Saline/Water
D10W	=	Dextrose 10% and Saline/Water
DBP	=	Diastolic Blood Pressure
ESR	=	Erythrocyte Sedimentation Rate
e.g.	=	For example
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
OPD	=	Out-Patient Department
ORS	=	Oral Rehydration Salts
PR	=	Pulse Rate
R/L	=	Ringers Lactate
RR	=	Respiratory Rate
SBP	=	Systolic Blood Pressure
SFP	=	Supplementary Feeding Program
SpO2	=	Oxygen Saturations
TB	=	Tuberculosis
TFP	=	Therapeutic Feeding Program
URTI	=	Upper Respiratory Tract Infection
UTI	=	Urinary Tract Infection
VCT	=	Voluntary Counselling and Testing

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# CHAPTER 1: APPROACHING PATIENTS

Kindness and respect are very important to successful care.

**\*\*Treat patients the way you, or your family would like to be treated\*\***

## 1.1 GENERAL APPROACH TO PATIENTS

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

1. **Greet** the patient.
  2. Make the patient **comfortable**: invite the patient to sit down, or lie down if they are very sick.
  3. Give the patient **privacy**:
    - Make sure nobody else can overhear or see the patient during the examination.
    - If possible there should be no more than 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.
  4. Check for **DANGER SIGNS** (see below). If the patient shows any danger signs then provide urgent and immediate treatment, consult the doctor and admit to IPD or refer to hospital.
  5. Take a **history** and look at their record book (lemma):
    - Main symptoms
    - Ask about any other symptoms
    - Medical problems – including any recent illnesses and treatment (especially important for antibiotics)
    - Medication history – do they take medications including traditional medicine
    - Family history – e.g. if has cough and suspect TB ask if anyone else in the family has been coughing
    - Smoking/alcohol – at same time advise them to stop/take less
  6. **Examine** the patient thoroughly including vital signs (BP, PR, RR, temperature, SpO2) and weight.
  7. Do any **investigations** that you think are appropriate e.g. CBC, malaria screen, biochemistry etc.
  8. Make a list of **possible diagnosis** and select the most likely (sometimes there is more than one diagnosis).
  9. **Classify** the patient as to whether they need:
    1. Referral to hospital (**DR-ABCDE first**)
    2. IPD admission (emergency room or IPD)
    3. OPD treatment
    4. Home care and education (no medications)
- \*\*Note:** If the patient needs **urgent referral**, give any essential treatment before the patient is sent\*\*
10. **Discuss** with the doctor if the patient is unwell, the condition and treatment are complicated or if you are uncertain.
  11. Give appropriate **treatment**.
  12. **Explain to the patient** (or the family) what is wrong with him/her and the treatment you are going to give. 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.
  13. If the patient needs admission, but they **need to go home**, explain to them why it is important for them to stay at the clinic e.g. 'because you are very unwell and you need strong antibiotics into the vein.' If they still want to go home then give them oral treatment if possible, and explain the danger signs to them and that they should come back to the clinic immediately if they have any. Write what you said to the patient in the lemma and that they have left the clinic against your advice.
  14. 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.

15. 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 them the first dose of any oral drugs in the clinic.
  - Ask the patient to wait for one hour before leaving the clinic in order 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.
16. Give **follow-up care (see below)**. Ask the patient to return for a follow-up OPD visit, if needed, and give a specific date. Also teach the patient and/or the family how to recognise **danger signs\*** (emphasise the specific danger signs for the disease). If the patient develops danger signs, he/she should 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.
17. **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.
18. 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.

#### SUMMARY STEPS TO PROVIDING PATIENT CARE:

Greet the patient, make them **comfortable**, make sure there is **privacy**

Assess for **emergency** or **DANGER** signs.  
If patient has any: **DR-ABCDE** (see *emergency chapter*), give immediate treatment, consult doctor, admit to IPD or refer to hospital

See the section below for **Danger signs**

Take a **history** from the patient

Perform an adequate physical **examination** including vital signs and weight

Carry out careful **investigation**

Make a list of possible **diagnoses** and select the most likely

**Classify** the patient as to whether they need:

1. Referral to hospital (**DR-ABCDE first**)
2. IPD admission (emergency room or IPD)
3. OPD treatment
4. Home care and education (no medications)

Identify the **treatment** to give to the patient

**Explain to the patient** about the diagnosis and give **preventive and screening** care

See the section below for **Preventative care**

Give **follow-up care**:  
Tell the patient which date he/she has to return to the clinic  
Explain how to recognise danger signs

See the section below for **Follow up care**

**Write** in lemma

## 1.2 DANGER SIGNS

### DANGER

**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 >2 secs

**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

This section covers preventative and screening care.

Some examples:

**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.185).
- 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.

**For pregnant women**

- Check tetanus immunisation status.
- Check for signs of anaemia, and provide prophylactic doses of anaemia treatment (see p.109).

**For children**

*See paediatric guidelines*

## 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.



## CHAPTER 2: UNIVERSAL PRECAUTIONS

### DEFINITION

Universal precautions are simple measures taken to prevent transmission of infection from body fluid and/or blood from:

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

All patients' body fluid should be considered infectious, since it is not known who is infected and who is not. The health worker is most at risk of needle prick injuries and splashes of body fluids into the eyes, mouth etc. These areas can be protected to some degree (*see below*), but awareness and avoidance of the potential risks are the best way of preventing infection.

### SUMMARY OF MANAGEMENT

- Wash hands with water and soap before and after patient contact and after removing gloves.
- 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 eye glasses or goggles, mask and/or gown.
- Reduce unnecessary procedures. For example, avoid unnecessary blood transfusions, injections, or suturing.
- Place a patient whose blood or body fluids are likely to contaminate surfaces or other patients in an isolation room or area.

## 2.1 HANDWASHING

Make sure there is running water in your clinic or at least ensure there is access to water.

Wash your hands with plenty of water and (antimicrobial) soap.

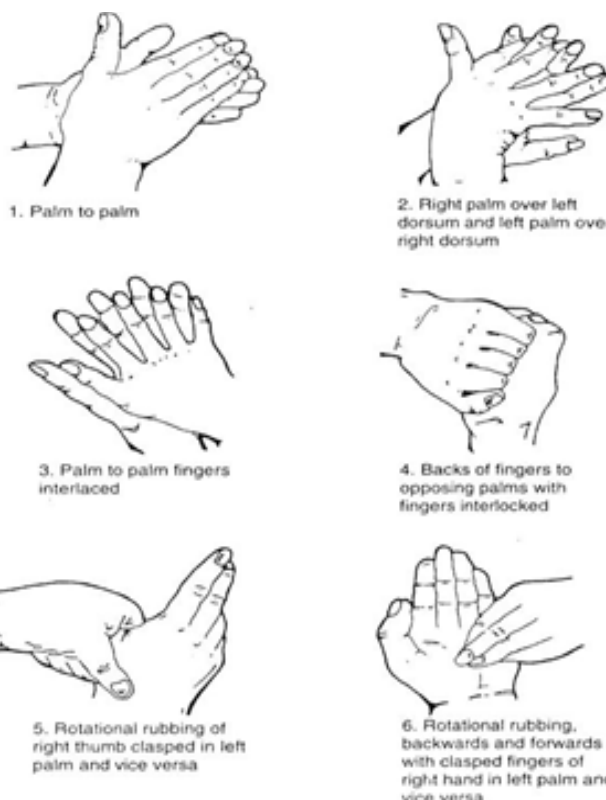
Washing hands with soap and water is preferable to alcohol wash.

Alcohol concentration of  $\geq 60\%$  needed.

Alcohol should not be used for visible dirt e.g. blood, mucous, saliva: use water and soap.

Hand washing with a good technique covering all surfaces of the hands at the right time is more important than the agent used or the length of time of hand washing (*see drawing for technique*)

- Wash hands immediately after contact with blood, body fluids, mucous membranes or broken skin, even if gloves are worn.
- 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.
- Wash hands after each patient contact.
- Wash hands after handling dirty items.



## 2.2 PROTECTIVE CLOTHING

### Gloves

- Wear clean, ordinary thin gloves anytime there is contact with blood, body fluids, mucous membrane, and broken skin.
- Change gloves between tasks or procedures on the same patient.
- Before going to another patient, remove gloves promptly and wash hands immediately.



**Gowns**

- Plastic gowns should be worn when there is a risk of splashes of blood or other fluids e.g. vaginal deliveries, opening abscesses. Clean them after use.
- Clean work clothes after use.

**Eye-cover and mask**

- Eyeglasses or goggles and a mask should be used when there is a risk of splashes of body fluids, for example, vaginal deliveries, opening abscesses.

**2.3 ISOLATION****For airborne transmission:**

- Place the patient in a separate room away from other patients. The patient's 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 sunlight.
- Wear a mask when working with the patient.
- Limit movement of the patient from the room to other areas.

**For droplet transmission:**

- Place the patient in an isolation room.
- 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.
- Avoid sharing equipment between patients. Use separate equipment for each patient, if supplies allow. If sharing equipment is unavoidable, clean and disinfect it before using it with the next patient.

**2.4 SHARPS**

- Never re-use needles. Avoid recapping needles.
- Discard contaminated disposable sharps immediately into a sharps container (puncture resistant and liquid proof containers).
- The precise 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.

**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 iodine.
- Clean and disinfect soiled linens and launder them safely. Avoid direct contact with items soiled with blood and body fluids.

**2.6 LAB STAFF**

- Assume all specimens are contaminated.
- Wear gloves.
- Wear eye protection if there is a risk of splashes.
- When cleaning lab equipment wear gloves.
- Do not eat 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,  
see post exposure prophylaxis chapter (p.7).

.....



## CHAPTER 3: POST EXPOSURE PROPHYLAXIS

### 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 prick = the person who is potentially at risk of becoming infected with HIV/hepatitis B or C due to 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, but immediately wash thoroughly with soap and water, and then rinse.
- When the skin is exposed but there is no wound, also wash thoroughly with soap and water, and then rinse.
- When eyes or mouth are exposed (e.g. blood/fluid splash), wash and flush with plenty of water.

**\*\*For cases of sexual violence see also clinical Management of rape in Gender Based Violence p.72\*\***

##### 2. Contact the person in charge of PEP and complete a needlestick/splash injury reporting form.

##### 3. Risk assessment

- Together with the PEP focal point or other experienced person, follow the steps below and make an assessment of the risk of infection and if PEP is needed
- Some exposures carry a greater risk of HIV and hepatitis B or C transmission 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, and give them pre-test counselling and only after getting their consent you can test their blood. Confidentiality must be maintained.
- If the patient has already left consider the likelihood that this patient has HIV and if possible try to contact the patient.

##### 6. Pre-test counselling for the exposed person

- During a confidential meeting with the exposed person, the following points should be discussed:  
For HIV:
  - The risk of transmission of HIV after accidental exposure to blood is estimated at 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%
- Explain that follow up and testing will be planned (see below)

##### 7. If possible and the source person consents do:

- a) **Rapid HIV test** (if positive send sample to Mae Sot Hospital for confirmation)
- b) **Rapid HBsAg test for hepatitis B** (if positive send sample to Mae Sot Hospital for confirmation)
- c) **Hepatitis C test – need to send to Mae Sot Hospital**
- Pre and post-test counselling must be done

##### 8. Take a serum save from the exposed person (blood sample that is not immediately tested).

- 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 as PEP is more effective if given quickly after the event.
- Only after starting PEP (if required), counselling and getting consent test the serum save blood test (see below)

**9. If required give specific PEP treatment (see below)**

- 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 blood for HIV and HBsAg.**

- It is important to test the serum save to know if the exposed person was not already HIV/hepatitis B positive
- If the exposed person cannot make a decision you can wait for a few days.
- If positive send to Mae Sot Hospital for confirmation

**11. Follow up (see below)**

## 3.2 POST EXPOSURE PROPHYLAXIS (PEP) TREATMENT

### 3.2.1 PEP FOR HUMAN IMMUNODEFICIENCY VIRUS (HIV)

DEFINITION

PEP for HIV is a 28-day 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 material.

What body materials from a person with HIV can contain the virus?

- Blood
- Sperm, vaginal fluids
- Amniotic fluid (important for midwives)
- 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 in 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, a decision can be made about starting PEP.

---

**General rule: When in doubt, start PEP.** You can always stop if it turned out to be not necessary.

The best moment 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\*\***

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

PEP treatment is a combination therapy of ART for a period of 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. The combination and the recommended doses, in the absence of known resistance to zidovudine (AZT) or lamivudine (3TC) in the source person are:

- **Zidovudine (AZT)** 300mg twice a day.
- **Lamivudine (3TC)** 150 mg twice a day.
- For the expanded regimen (a third drug is added), **Ritonavir boosted Lopinavir (LPV/r)** is recommended.

The number and combination of drugs should be chosen with regard to the health agency's protocol. For example in place of AZT, Tenofovir (TDF) may be used, in place of 3TC, Emtricitabine (FTC) may be used. Atazanavir (ATV) boosted with a ritonavir may be used in place of LPV/r. Expert consultation may be necessary when exposure to drug resistant HIV may have occurred. It is important to have access to a full 28 days of ART once PEP is begun. In some clinics a PEP starter kit is available and the exposed person will be referred to a Thai hospital for further treatment.

**Side Effects:** Nausea, diarrhoea, muscle pain and headache. These symptoms will only last for a few days. Explain this to the patient, or else the patient may stop 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 (see p.90). 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.

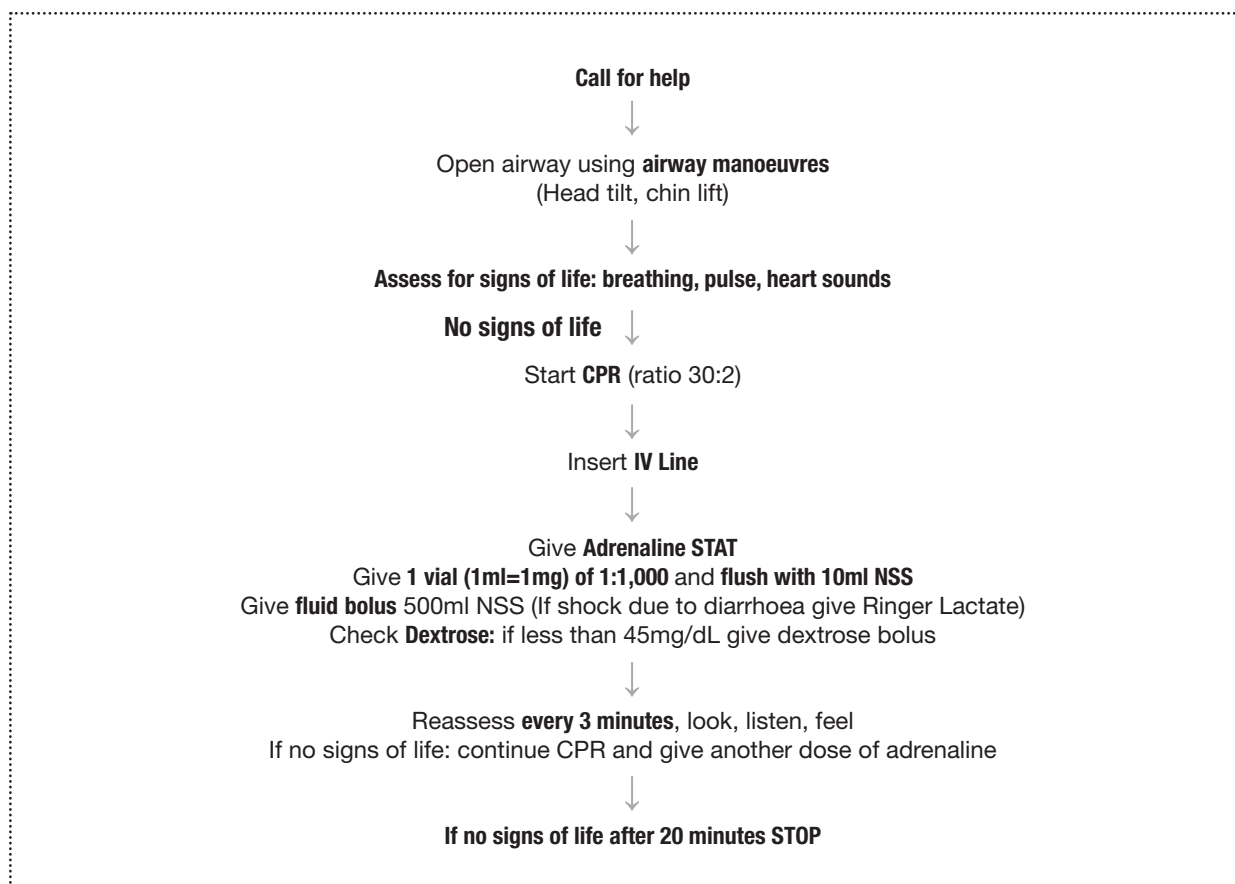
### 3.3 FOLLOW UP FOR ALL EXPOSED PERSONS

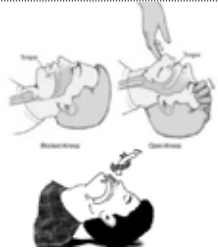

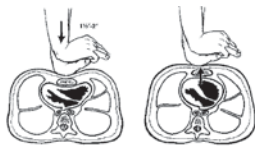
- Providing psychological support is key at this time, as not knowing whether you have become infected with HIV or hepatitis can be very distressing.
- In the weeks following the accident the person should be monitored for signs indicating HIV infection: acute fever, lymphadenopathy, cutaneous eruption (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



## CHAPTER 4: EMERGENCIES

### 4.1 CARDIO-PULMONARY RESUSCITATION (CPR) FOR ADULTS



<b>AIRWAY</b>	<p><b>Head Tilt and Chin Lift</b> – place hand on forehead and tilt head back (head tilt) and place fingers below chin and pull up (chin lift).</p> <p><b>Oropharyngeal airway</b> (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.</p>	
<b>BREATH</b>	Use a <b>bag, valve mask</b> attached to high flow <b>oxygen</b> . 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.	
<b>CHEST COMPRESSION</b>	Middle of the chest, depth 5-6cm, rate 100-120/minute, when giving breaths <b>STOP</b> chest compressions.	

## 4.2 GENERAL APPROACH TO EMERGENCY

**\*\*IF UNCONSCIOUS, DO AIRWAY MANOEUVRES, QUICK 10 SECOND ASSESSMENT (LOOK, LISTEN, FEEL), IF NO BREATHING/NO PULSE → START CPR (see p. 11), CALL FOR HELP\*\***

	ASSESS FOR	TREAT
<b>DR</b>	Danger Response – does patient respond?	Gloves for you Safe place for patient Call for help
<b>Airway</b>	Any airway obstruction Speaking Stridor Secretions Swelling	Simple airway manoeuvres Suction if available Oral/nasal airway Oxygen 15L reservoir mask
<b>Breathing</b>	Respiratory rate Oxygen saturations (SpO <sub>2</sub> ) Pattern of breathing Cyanosis Accessory muscle use/tracheal tug/chest in-drawing Listen to chest	Position patient sitting up if breathing problem Consider nebulisers
<b>Circulation</b>	Pulse rate Blood pressure Capillary refill time Urine output Temperature	IV line Blood tests Fluid bolus Consider transfusion
<b>Drugs/Dextrose</b>	Check dextrose Seizures Pain	Consider antibiotics Correct blood sugar Control seizures Control pain
<b>Everything Else</b>	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
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

### EMERGENCY FLUIDS

**Fluid Bolus: NSS:** (if shock due to diarrhoea use Ringer's Lactate)

Adult: 500ml IV

Child: 10ml/kg IV

Re-check vital signs before repeating



EMERGENCY DRUGS											
<b>CPR</b> <b>Adrenaline IV: 1 in 1,000 (1mg/ml)</b> <ul style="list-style-type: none"> <li>Adult: give <b>1mg (1ml)</b> and then <b>flush with 10ml NSS</b></li> <li>Child: <b>Dilute 1 vial (1mg=1ml) of 1 in 1,000 in 9ml NSS (total 10ml)</b> and give <b>0.1ml/kg</b></li> </ul> <b>**Note: the correct concentration for cardiac arrest is 1 in 10,000 but it is not available so follow instructions carefully to dilute the 1 in 1,000 adrenaline to give the correct dose**</b>	<b>ANAPHYLAXIS:</b> <b>Adrenaline IM: 1 in 1,000 (1mg/ml)</b> Give undiluted IM in the thigh <table> <tr> <td>&gt;12yrs/Adult:</td><td><b>0.5ml</b></td></tr> <tr> <td>6yrs-12yrs:</td><td><b>0.25ml</b></td></tr> <tr> <td>6m-6y:</td><td><b>0.12ml</b></td></tr> <tr> <td>&lt;6m:</td><td><b>0.05ml</b></td></tr> </table>	>12yrs/Adult:	<b>0.5ml</b>	6yrs-12yrs:	<b>0.25ml</b>	6m-6y:	<b>0.12ml</b>	<6m:	<b>0.05ml</b>		
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6m-6y:	<b>0.12ml</b>										
<6m:	<b>0.05ml</b>										
<b>SEIZURES</b> <b>Diazepam IV or IM or PR</b> Adult: <b>Slow 10mg</b> Child: <b>0.4mg/kg</b> (max 10mg) Can repeat twice if convulsions do not resolve in 10 minutes	<b>Chlorpheniramine IV:</b> Give STAT over 1 minute <table> <tr> <td>Adult:</td><td><b>10-20mg</b></td></tr> <tr> <td>12-18yrs:</td><td><b>10mg</b></td></tr> <tr> <td>6-12yrs:</td><td><b>5mg</b></td></tr> <tr> <td>6m-6yrs:</td><td><b>2.5mg</b></td></tr> <tr> <td>&lt;6m:</td><td><b>250mcg/kg</b> (max. 2.5mg)</td></tr> </table>	Adult:	<b>10-20mg</b>	12-18yrs:	<b>10mg</b>	6-12yrs:	<b>5mg</b>	6m-6yrs:	<b>2.5mg</b>	<6m:	<b>250mcg/kg</b> (max. 2.5mg)
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6-12yrs:	<b>5mg</b>										
6m-6yrs:	<b>2.5mg</b>										
<6m:	<b>250mcg/kg</b> (max. 2.5mg)										
<b>HYPOGLYCAEMIA = blood sugar &lt;70mg/dL</b> <ul style="list-style-type: none"> <li>If dextrose <b>45-70mg/dL</b>:               <ul style="list-style-type: none"> <li>Give oral sugar solution (water mixed with sugar) or sweet drink to prevent severe hypoglycaemia.</li> </ul> </li> <li>If dextrose <b>&lt;45mg/dL</b>:               <ul style="list-style-type: none"> <li><b>If able to drink</b>: give oral sugar solution (water mixed with sugar) or sweet drink</li> <li><b>If unable to drink e.g. in coma</b>: insert IV cannula and give Adult/Child: <b>5ml/kg 10% dextrose bolus</b>, Neonate <b>2ml/kg 10% dextrose</b></li> </ul> </li> </ul>	<b>Hydrocortisone (slow IV or IM):</b> <table> <tr> <td>&gt;12yrs/Adult</td><td><b>200mg</b></td></tr> <tr> <td>6-12yrs:</td><td><b>100mg</b></td></tr> <tr> <td>1-5yrs:</td><td><b>50mg</b></td></tr> <tr> <td>&lt;1yr:</td><td><b>25mg</b></td></tr> </table>	>12yrs/Adult	<b>200mg</b>	6-12yrs:	<b>100mg</b>	1-5yrs:	<b>50mg</b>	<1yr:	<b>25mg</b>		
>12yrs/Adult	<b>200mg</b>										
6-12yrs:	<b>100mg</b>										
1-5yrs:	<b>50mg</b>										
<1yr:	<b>25mg</b>										

HANDOVER/COMMUNICATION	
<b>YOU</b>	Give YOUR name and what your role is (e.g. medic/midwife) Give patient's name and location e.g. what clinic, IPD? OPD? ANC?
<b>YOUR PATIENT</b>	Admission diagnosis Explain why you are concerned e.g. calling to update doctor, calling because patient unwell Give brief summary of patients background
<b>ASSESSMENT</b>	Give your ABCDE assessment (important details) How worried and why?
<b>QUESTION</b>	What do you want from the person you are speaking to?

#### Normal vital signs per age

Age	Respiratory Rate (RR) (breaths per minute)	Pulse Rate (PR) (beats per minute)	Systolic Blood Pressure (BP) (mmHg)	Urine output
<b>&lt;2 months</b>	<60	110-160	Use cap refill instead	At least 1ml/kg/hr
<b>2-12 months</b>	<50	110-160	Use cap refill instead	At least 1ml/kg/hr
<b>1-5 years</b>	<40	100-150	80-100	At least 1ml/kg/hr
<b>5-12 years</b>	<30	80-120	90-110	At least 1ml/kg/hr
<b>&gt;12 years</b>	<20	60-100	110-120	At least 1ml/kg/hr
<b>Adults</b>	12-20	60-100 (may be 40-60 in well trained athlete)	90-140* see note below	At least 0.5ml/kg/hr

\* BP can be different in each patient– for some people SBP of 90 is normal. But, for example, if a patient's SBP is usually 140 and when you check it is 90 this could be a sign of shock. It can be helpful to look at ANC book and Lemma to see what the patient's normal BP is.

## 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.

---

**Shock is an emergency, delay in treatment causes death**  
**Low BP is a late sign in shock. Do not wait for low BP before treating shock**

---

### CAUSES

#### 1. HYPOVOLEMIC SHOCK (Shock caused by loss of blood or fluids):

Causes:

- 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):

- 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):

- Vitamin B1 deficiency (see p.187)
- Damaged heart valve (see p.40)
- Abnormal rhythm of the heart: too fast (tachycardia) or too slow (bradycardia)
- Lung collapse (pneumothorax)
- Heart attack (myocardial infarction)

#### 4. SEPTIC SHOCK (shock caused by the effects of an infection on the body)

Causes:

- 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:

- **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. **Note: Low BP is a late sign of shock, do not wait for low BP in treating a patient with other signs of shock**
- **Low urine output** (= oliguria): urine production less than 0.5ml/kg/hr in adults and 1ml/kg/hr in children
- **Change in mental state:** at the onset patients are agitated, then confused, then drowsy and then in coma.

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), 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.

## SPECIFIC EMERGENCY MANAGEMENT

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p. 12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>SHOCK</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) <b>Oxygen</b> (high flow) <b>Adrenaline nebuliser</b> 5ml STAT if anaphylactic shock and airway swelling or stridor
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	<b>Salbutamol nebuliser</b> 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)
<b>C</b>	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)
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	<i>For details on specific treatment see below</i> Septic shock: <b>ceftriaxone</b> Anaphylactic shock: <b>adrenaline</b> IM, <b>chlorpheniramine</b> , <b>hydrocortisone</b> Cardiogenic shock: <b>furosemide</b> +/- <b>vitamin B1</b> Give <b>dextrose</b> if low
<b>E</b>	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

Other treatment depends on the cause. Most common causes are:

**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.
- 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: **ceftriaxone**, preferably IV (or IM if cannot get IV access).
- 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.
- **Give:**

	<b>ADRENALINE</b> IM: 1 in 1,000 (1 vial = 1ml = 1mg)	<b>CHLORPHENIRAMINE</b> IV or IM (1 vial = 1ml = 10mg)	<b>HYDROCORTISONE</b> SLOW IV OR IM
<b>ACUTE PHASE</b>	>12yrs/Adult: <b>0.5ml</b> 6yrs-12yrs: <b>0.25ml</b> 6m-6yrs: <b>0.12ml</b> <6m: <b>0.05ml</b>  Repeat dose at 5 minutes intervals until BP and pulse are back to normal	Adult: <b>10-20mg</b> 12-18yrs: <b>10mg</b> 6-12yrs: <b>5mg</b> 6m-6yrs: <b>2.5mg</b> <6m: <b>250 mcg/kg</b> (max. 2.5 mg)  Give STAT over 1 minute	>12yrs/Adult <b>200mg</b> 6-12yrs: <b>100mg</b> 1-5yrs: <b>50mg</b> <1yr: <b>25mg</b>  (Can also use <b>dexamethasone</b> )
<b>AFTER ACUTE PHASE</b>	<b>Not required</b>	Continue QID, switch to PO <b>chlorpheniramine</b> when improved:  >12yrs/Adult: <b>4mg QID</b> (max 24mg/d) 6-12yrs: <b>2mg QID</b> (max 12mg/d) 3-5yrs: <b>2mg QID</b> (max 6mg/d) 1-2yrs: <b>1mg BID</b> (max 3mg/d)	Can repeat <b>hydrocortisone</b> 3-4 times per day if required.  Switch to PO <b>prednisolone</b> when improved/stable.

#### 4. CARDIOGENIC SHOCK

- Treat the cause (e.g. anaemia, Beriberi).
- For heart failure treatment see pg.36.

#### 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 (using DR-ABCDE)

#### 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.

Ideally, people who have a history of a severe allergy reaction to insect bites or medicines should be instructed to carry (and use) an emergency kit consisting of injectable adrenaline (epinephrine) and chewable antihistamine (if available). They should also wear a bracelet or necklace stating their allergy.

## 4.4 COMA

### DEFINITION

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

- Drowsiness Patient can be easily woken up by talking or touching them
- Stupor Patient can be woken up with strong stimulation (e.g. speaking loudly or touching firmly).
- Coma Patient cannot be woken up

### EMERGENCY TREATMENT

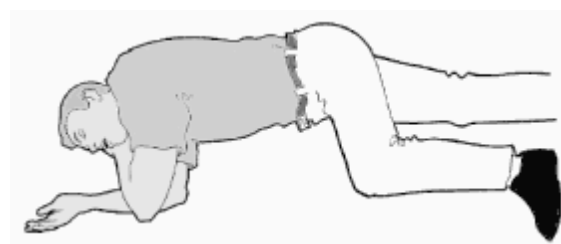
#### 1. ASSESS AND TREAT: THINK DR-ABCDE:

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p. 12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR COMA
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) <b>Oxygen</b> (high flow)
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	<b>Nebuliser</b> if wheeze Position patient: If dyspnoea sit up right but if very low BP raise legs to level above head
<b>C</b>	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 <b>NSS</b> Adult: 500ml STAT; Child 10ml/kg STAT (or R/L if diarrhoea)
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	Give dextrose if low Give <b>medications according to cause</b>
<b>E</b>	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan Assess for cause of coma, and treat <b>Coma position</b> to prevent aspiration (see below)
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

#### 2. COMA POSITION:

The coma position prevents the patient from swallowing his tongue or choking in his own vomit. Put the patient on his side as shown in the following picture. (If pregnant turn on to left side as less compression of the abdominal vessels.) One leg is bent at the knee. If the coma is following a trauma e.g. car/motorbike accident do not move the patient to the side (as they may have injury to the spine).



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

Respiratory rate and pulse must be checked constantly.

If heart or breathing stops, put the patient on his back and start CPR (see p.11).

## SIGNS AND SYMPTOMS

### Ask questions to the family

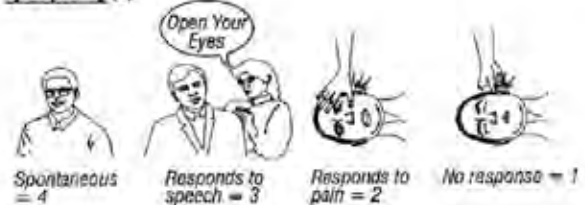
- What is the past medical history of the patient?
- Which symptoms were there before the coma (fever, headache, vomiting, convulsions)?
- Has any medicine been given?
- Has the patient had an accident? If so, when?
- Has the patient taken any poison, medicine, alcohol?

### 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 (see below)
  - Check the pupils; if they are of different sizes consider cerebral haemorrhage. Refer to hospital (see stroke, p.24).
  - 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.

Glasgow Coma Scale	Score
<b>• Eye opening (E)</b> <ul style="list-style-type: none"> <li>- Spontaneous</li> <li>- Eyes open to speech</li> <li>- Eyes open to pain</li> <li>- Eyes stay closed</li> </ul>	4 3 2 1
<b>• Best Motor response (M)</b> <ul style="list-style-type: none"> <li>- Obeys commands</li> <li>- Localises to pain</li> <li>- Pulls away from pain</li> <li>- Flexes abnormally to pain</li> <li>- Extends abnormally to pain</li> <li>- No movement</li> </ul>	6 5 4 3 2 1
<b>• Best Verbal response (V)</b> <ul style="list-style-type: none"> <li>- Oriented/Not confused</li> <li>- Confused</li> <li>- Inappropriate words</li> <li>- Sounds but no words</li> <li>- No sounds</li> </ul>	5 4 3 2 1
Total score is between 3 and 15: <ul style="list-style-type: none"> <li>• A score below 5 suggests poor outcome depending on cause, especially in trauma.</li> <li>• A score below 8 indicates severe coma.</li> </ul>	
For Blantyre score see paediatric guidelines	

### Eye Opening (E)



### Motor Response (M)



### Verbal Response (V)



FIG. 1  
(Prior Art)

### For example:

Patient opens their eyes when you tell them to open them **E=3**

When you cause them 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 possible cause and treat it:**

	Possible Cause
<b>Coma with fever</b>	Malaria, meningitis, encephalitis, sepsis, or other severe infections
<b>Coma with or without fever</b>	Severe hypoglycaemia (dextrose <45mg/dL or <2.5mmol/l) Severe dehydration
<b>Coma without fever</b>	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 from one side to the other. Show the family how to re-position the patient. Remind them not to let the patient lie flat on his back. In that case 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. 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 movements** of the arms and legs generally lasting for a few minutes. Sometimes the patient also passes urine or bites his tongue.

**\*\*If your patient regains consciousness immediately and is not disorientated after the attack, or if the patient remains conscious during the crisis, it is not a convulsion\*\***

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

**EMERGENCY TREATMENT**

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p. 12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*



	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>CONVULSIONS</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed <b>Suction any secretions/vomit</b> if needed (and available) <b>Oxygen</b> (high flow)
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	
<b>C</b>	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)
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	If fitting continues for more than 3 minutes give: <b>Diazepam Slow IV or IM or PR</b> <b>Adults: 10mg</b> (1 vial) (if IV max 0.5ml in 30 seconds) <b>Child: 0.4mg/kg</b> (max 10mg) **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 <b>IV</b> Adult and Child: <b>5ml/kg 10% dextrose bolus</b> Neonates: <b>2ml/kg 10% dextrose bolus</b> Give any other drugs according to cause
<b>E</b>	AVPU/GCS Expose and examine all over body	History, further investigations, treatment plan. Assess for cause of convulsion, and treat. <b>Coma position</b> to prevent aspiration (see below) after fitting if no respiratory distress
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

**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 3-5 minutes** give a second dose of diazepam
- **CALL DOCTOR, AND BEGIN REFERRAL PROCESS**
- **After another 3-5 minutes** give a third dose of diazepam

**\*\*Note:** Ideally we would give **IV phenobarbitone** but not available so need to refer – the patient is at risk of not getting enough oxygen to the brain so this must be done urgently\*\*

**Remember:**

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)

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

Chest Pain can be caused by many problems. See p. 35 for more detail. Be aware of the danger signs:

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

**\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>CHEST PAIN</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) <b>Oxygen</b> (high flow)
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	
<b>C</b>	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 (if know how to read it)
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	If danger signs or ECG shows signs of infarction: give <b>300mg Aspirin</b> to treat for myocardial infarction
<b>E</b>	AVPU/GCS Expose and examine all over body	History, further investigations, treatment plan. <b>Assess for cause of chest pain, and treat /refer</b>
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

**\*\*THIS PATIENT NEEDS IMMEDIATE REFERRAL TO HOSPITAL FOR FURTHER TREATMENT\*\***

## 4.7 DIABETIC EMERGENCIES

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.

**\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p. 12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

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

### HYPERGLYCAEMIA (Dextrose >200mg/dL or >11 mmol/L)

- Think about diagnosis of diabetes if
  - No history but has symptoms of diabetes
  - Has history of diabetes and has been unwell recently or does not take medications regularly, may have poor appetite
  - Fast RR, ketotic breath (breath smells sweet), dehydration, vomiting, abdominal pain, coma
  - Urine dipstick positive for ketones
- Insert an IV cannula, start **NSS**:
  - Adult 1L in 1 hour
  - Children 10ml/kg in 1 hour (the risk of fluid overload is higher in children)
- This patient needs insulin that is not available at many clinics, after starting IV fluids discuss with the doctor about referring to hospital. (If the patient has Type 2 Diabetes the blood sugar may decrease with IV fluids, and may be treated without referring).

### HYPOGLYCAEMIA (Dextrose <70mg/dL (=3.8mmol/l) **Note:** <45mg/dL (=2.5mmol/l) is **severe hypoglycaemia**)

- Symptoms: sweating, hunger, tremor, dizziness, drowsiness, aggressive/irritable, confusion, convulsion, coma
  - If dextrose 45-70mg/dL:
    - Give oral sugar solution (water mixed with sugar) or sweet drink to prevent severe hypoglycaemia.
  - If dextrose <45mg/dL:
    - 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

## 4.8 GASTRO-INTESTINAL BLEEDING

### CAUSES

- Peptic ulcer disease
- Varices (from portal hypertension from liver disease e.g. alcoholism)

### SIGNS/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 ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

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

### SECONDARY TREATMENT

No food or drink

- REFER TO HOSPITAL URGENTLY

### SPECIFIC TREATMENT

If suspect **peptic ulcer disease** (e.g. history of abdominal pain, no risk factors for liver disease) (see p.80)

- Give **omeprazole** IV 40mg (or PO if no IV) or **ranitidine** 50mg IV (diluted to 20ml given over 2 minutes)

If suspect **portal hypertension** from **cirrhosis** (see p.93) (e.g. history of high alcohol intake, chronic hep B or C or signs of 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:** Time is important, needs URGENT to transfer to the hospital if you see **any single one** of these signs.

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p. 12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

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

**Note:** If the stroke is very severe it may be more appropriate not to refer or give treatment, and follow palliative care (see p.192). Discuss with a doctor.

### TREATMENT

- **Urgent referral to 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

## 5

## CHAPTER 5: COMMON 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.

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: meningism, 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.

TREATMENT

**Look for signs of serious illness and provide appropriate (e.g. antibiotic or anti-malarial) treatment**

**If fever over 38°C in Adults:**

- 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).
- Give **paracetamol**

Adults	<b>1g QID (max 4g daily)</b>
Children	<b>15mg/kg (max 2g daily).</b>
- 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).

**Note:** For patients with fever who are comatose and cannot swallow, it is possible to give paracetamol PR or IV.

Never give aspirin to children under 12 years

**Try to find and treat the cause of the fever:**

SYMPTOMS	POSSIBLE DISEASE	Page
Chills, headache, sweating, consciousness disorders	Malaria	see malaria guidelines
Headache, neurological signs, neck stiffness, photophobia	Meningitis/Encephalitis	130
Muscle pain, rash, headache, nausea/ vomiting	Dengue	138/140
Respiratory signs	Acute respiratory infection	203
Urinary signs	Pyelonephritis	99
Diarrhoea with mucus and blood	Bacterial diarrhoea	83
Abscess infected skin lesions	Skin infection	223
Shock, chills	Septicaemia	14
Painful big liver	Liver abscess	96
Prolonged high fever	Typhoid fever	135
Eschar, lymphadenopathy, rash, prolonged fever	Scrub typhus	133
Prolonged fever with cough and weight loss	TB	216
Isolated fever, body pain, running nose	Viral infection	199
Others	Cancer, HIV/AIDS	191/119

If there are no signs of serious illness and/or you cannot find an obvious diagnosis, you can send the patient home on paracetamol treatment with advice to drink plenty of fluids. Tell your patients that they should come back to your clinic if there is no improvement within 48 hours. If you think the patient cannot come back (e.g. transportation problem, poor understanding of disease) keep your patient in IPD for observation. Do not forget to 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 or scrub typhus

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## HYPOTHERMIA

### DEFINITION

Temperature less than 35.5 °C.

Hypothermia can happen in:

- Sepsis (p.14)
- Neonates, especially preterm
- Severely malnourished children (p.175)
- Drowning
- Hypoglycaemia (p.57)
- Diabetes mellitus (p.53)
- Alcohol abuse (p.154)

### TREATMENT

- Treat the cause
- Keep patients warm with blankets.
- Use kangaroo method (see *neonatal guidelines*)

## 5.2 FATIGUE / TIREDNESS

### DEFINITION

Fatigue/tiredness is a common symptom that many of us have experienced at some time in our lives. These symptoms are more common 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 is a non-specific symptom therefore you need to ask lots of questions about other symptoms that they may have. (See table). Remember to ask about sleeping pattern and caffeine intake.
- Social history, including smoking and alcohol.
- Mental health check: ask directly about feelings of sadness or depression, stress, worries, problems in the family, daily activities and appetite. (see *Mental Health chapter p.147*)

#### Examination:

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

Use this table to help you look for the different possible causes:

POSSIBLE CAUSES	SYMPTOMS	INVESTIGATIONS	PAGE
Infections (viral, HIV, TB etc.)	Enlarged painful lymph nodes, fever, chronic cough/ diarrhoea, rash	NPA, HIV, AFB, CXR	129/199
Anaemia (iron deficiency, thalassaemia)	Pallor (enlarged spleen), dyspnoea, heavy menstruation	Hct, CBC, thalassaemia screen, G6PD	109
Hypothyroidism	Lethargy, constipation, stiffness, weight gain, dry skin, hair change	TFT	58
Pregnancy	Tiredness, nausea, dizziness	Urine pregnancy test	See obstetric guidelines
Diabetes mellitus	Passing urine very often, weight loss, thirsty	Urine dextrose +/- blood dextrose	53
Lung disease	Difficulty in breathing, wheeze, cough	CXR	208



Heart problems (heart failure, valvular heart disease, pericardial disease, arrhythmias)	Difficulty in breathing, slow or fast pulse rate, oedema, chest pain	ECG, Echocardiogram (heart ultrasound)	31
Kidney problems	Oedema, itching, decreased urine	Creatinine, BUN, kidney ultrasound	103
Stomach and intestinal problems.	Diarrhoea, vomiting, nausea, epigastric pain	Stool sample	77
Cancer	Weight loss, enlarged lymph-nodes, pallor, dysphagia	CXR, CBC	191
Vitamin B1 deficiency (especially in pregnancy)	Numbness of limbs	-	187
Psychological problems	Depression, anxiety	-	147

### 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 weeks 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 explain that such problems can cause fatigue and tiredness (see *mood disorders p.147* for example).

### PREVENTION

Tell your patient to avoid stress, have a healthy diet, and take enough rest.

## 5.3 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: Your patient complains of pain – but pain is NOT a diagnosis.** Try to find the disease (history, clinical examination) and **always** treat the pain (see below).

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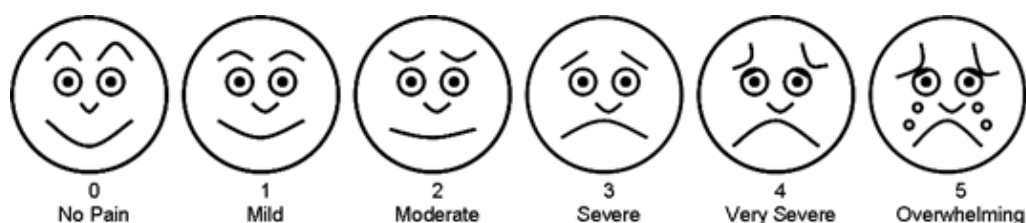
Post-operative pain relief is very important for better recovery of the patient.

---

### 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 include: 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 below.



### 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.

**Treatment ladder of pain relief:** For doses see *pharmacy handbook p.241*.

Step 1	Step 2	Step 3	Step 4
<b>Paracetamol</b>  (Consider <b>Amitriptyline</b> for nerve pain)	NSAID e.g. <b>Ibuprofen</b> or <b>diclofenac</b> <b>AND</b> <b>Paracetamol</b>	Weak opioid e.g. <b>Tramadol</b> <b>AND</b> <b>Paracetamol</b> +/- <b>Ibuprofen</b>	Strong opioid e.g. <b>Morphine</b>

\*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

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**Note:** Do not give ASA in children below 12 years.  
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 like **ibuprofen** or **diclofenac** if not contraindicated.
- **Amitriptyline low dose** (high doses are used 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 **tramadol** then needs step 4 medication, this may not be available at the clinic so consider referral.

---

**Note:** It is important to tell patients never to exceed the maximum recommended dose of painkillers. If the pain is not controlled they must come back to clinic

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**Important points to consider when prescribing:**

- Use oral medication when possible.
- 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.
- Give painkillers at regular times, rather than on patient request. This is very important in post-operative pain management especially.
- 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).
- It is important to tell patients about the side effects and what to do if they happen.
- Do not give ASA, ibuprofen or diclofenac for epigastric pain. These medicines worsen gastritis and peptic ulcer disease (see p.79).

**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**.  
Medication to treat anxiety: **diazepam**.
- 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 chapter p.191*.
- Corticosteroids (e.g. prednisolone) may have some pain relieving 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 (avoid by taking with meals, stop if epigastric pain/blood in stool/melaena). If possible avoid in very elderly and use just paracetamol.
- Tramadol – confusion (especially in elderly), drowsiness, constipation.

## 5.4 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

1. Infections e.g. meningitis, cerebral malaria, encephalitis, sepsis, syphilis, AIDS
2. Metabolic e.g. hyper/hypoglycaemia, vitamin B1 deficiencies
3. Endocrine disorders
4. Neurological e.g. raised intracranial pressure, head trauma, stroke, brain tumour
5. Electrolyte abnormality e.g. low sodium
6. Drug side effect e.g. steroids, opioids
7. Withdrawal of substances
8. 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 often best to ask the family members as they will be able to 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 above causes of confusion.**

### TREATMENT

Treat the underlying cause.



## CHAPTER 6: CARDIOVASCULAR DISEASES

**\*\*For emergency management of chest pain see emergency chapter p.21\*\***

### 6.1 HYPERTENSION

#### DEFINITION

- 1. HYPERTENSION, OR HIGH BLOOD PRESSURE (HBP)** is a Systolic BP (SBP) equal or greater than 140mmHg and/or Diastolic BP (DBP) equal or greater to 90mmHg (**≥ 140/90mmHg**).
  - Hypertension is a risk factor for stroke (see p.24), heart attack (see p.35), and kidney 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 (see p.53) and if the patient already has heart disease or kidney disease.
- 2. MALIGNANT HYPERTENSION** is very high blood pressure (SBP >180 OR DBP >120) that acutely affects one or more organs → **this is an EMERGENCY**.
  - See below 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**'.

Only rarely (5%) can a cause be found. This is called '**Secondary Hypertension**'. Those causes include:

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

**\*\*Think of secondary hypertension especially if: young, have another disease or on regular medication\*\***

#### SIGNS AND SYMPTOMS

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

#### COMPLICATIONS

##### Complications of ACUTELY high BP (EMERGENCY):

##### Malignant Hypertension

This is a condition of very high blood pressure (SBP >180 OR DBP >120) 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 (see p.24)
- Retina:** acute visual problems
- Kidneys:** acute kidney failure (see p.103)
- Heart:** acute heart failure (see p.36), aortic dissection (tear in aorta – causes severe chest pain, may cause different BP measurements in right and left arms)

##### Complications of CHRONICALLY high BP:

If patients have high blood pressure for a long time then they may get complications/symptoms below:

- Peripheral blood vessels:**  
HBP may damage blood vessels causing pain in the legs when walking (**claudication**).
- Central Nervous System:**  
**Stroke** is a common complication of HBP (see p.24). **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 **bad eyesight** but blindness is rare.
- **Heart:**  
There is a higher incidence of heart disease associated with HBP mainly because of **ischaemic heart disease** (see p. 36). 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** (see p.36). **Atrial fibrillation (irregular heart rhythm)** is common.
- **Kidneys:**  
Kidney disease can cause HBP but chronic HBP can also cause **chronic kidney failure**.

## DIAGNOSIS

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Unless there is severe hypertension (systolic BP > 180 OR diastolic BP > 120) AND/OR complications (see *algorithm*), you will declare the patient as HBP **ONLY** after you have found abnormal BP values **once every week for 3 weeks**.

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**Note:** It is recommended that healthy adults should have their BP checked every 3 years.

### How to take Blood Pressure

- The patient should sit quietly for at least 5 minutes before measuring the BP (in the sitting position).
- Measure the BP always on the same arm for the same patient (write on the chart which arm you use).
- Measure the BP to the nearest 2mmHg. Do not approximate measurements so that all readings end 0 or 5.

## ASSESSMENT OF HBP

1. Obtain accurate BP measurements as described above every week for 3 weeks
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

## TREATMENT

### Explanation to patient

- Explain to patients that hypertension is a disease that may not have any symptoms, but it puts them at higher risk for problems like stroke and heart attack.
- This risk can be reduced by lifestyle changes and in some cases medication.
- The medication will not cure the problem but will decrease the risk. They will have to take medication and follow up for the rest of their life.

### Lifestyle advice for all patients

- Reduce the amount of salt in diet.
- Healthy diet e.g. avoid fatty foods / eat more vegetables and fruit. – see *nutrition chapter p.185*
- Lose weight if overweight or obese.
- Alcohol: Advise the patient to stop or if unable to stop at least to reduce.
- Smoking: Advise the patient to stop or if unable to stop at least to reduce.
- Exercise at least 30 minutes most days of the week.

### When to start medication for HBP (see Table 1):

- (If suspect HBP because of anxiety or because patient is unwell wait until the patient is calmer or better and repeat)
- **Discuss with doctor all NEW cases of hypertension and follow Table 1.**
- **Only start medication if the patient has HBP 3 times in 3 weeks.** This means that the high BP is likely not to be a single episode, and if the patient follows up every week it is a sign that they will be more likely to follow up 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).
- **Once BP is stable on one or two medications then continue the same dose.**
- If going to start new medication do an ECG before starting.

### When following up:

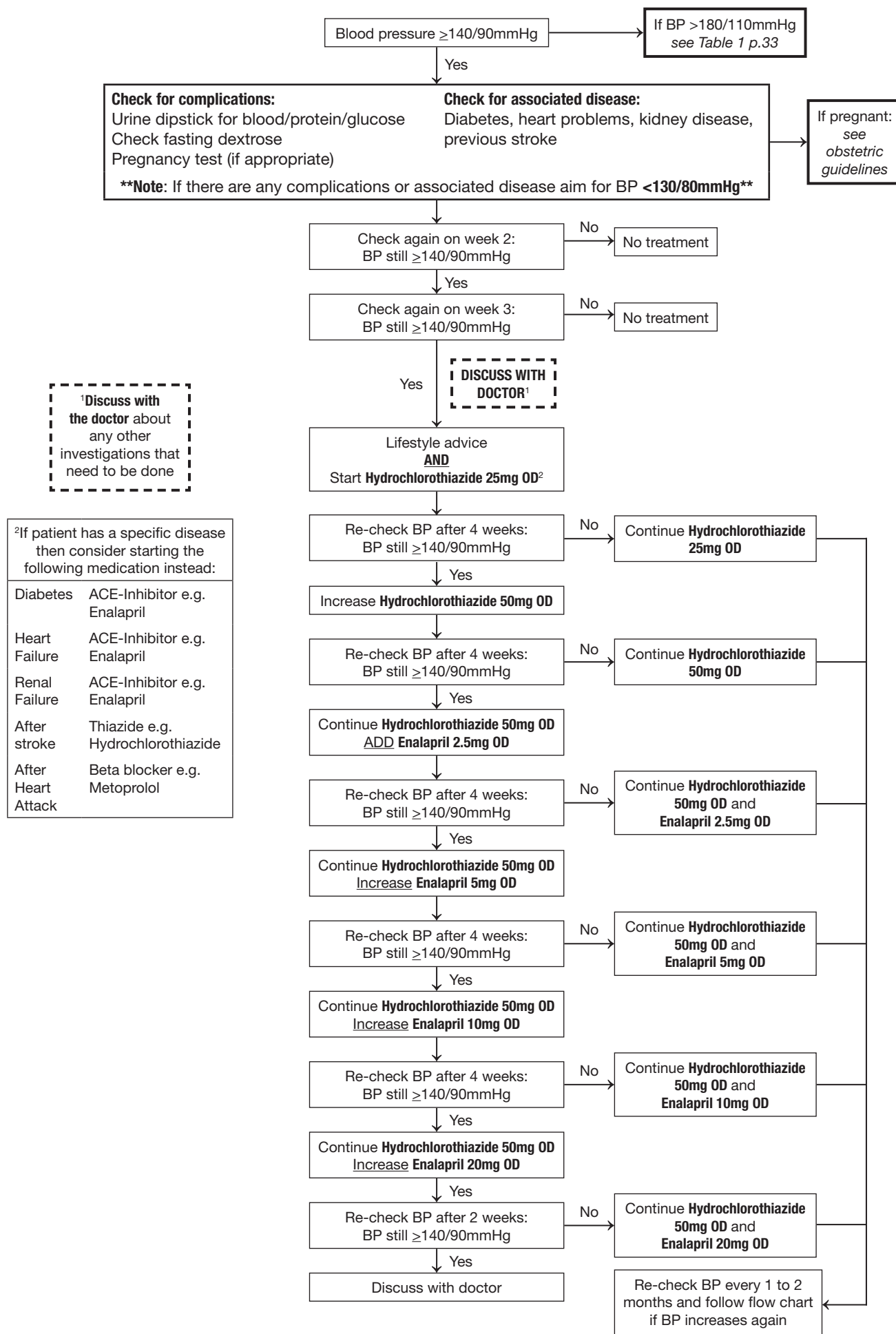
- If the patient is not attending regular follow up then STOP the medication.
- Before increasing the dose or changing the medication make sure you check that the patient has been taking the drug every day as instructed.
- Before starting enalapril do a pregnancy test for females.

- If BP too low with medication then reduce dose by same amount you increased it by e.g. if on enalapril 5mg OD reduce to enalapril 2.5mg OD.

**Table 1: Treatment Options According to BP Measurement**

SBP	DBP	Treatment
130-139	80-89	Only monitor +/- treat if have associated disease e.g. diabetes, heart problems, kidney disease, previous stroke. <b>See algorithm</b>
140-179	90-109	<b>See algorithm</b>
180-200	110-120	<p><b>**Note: If signs of malignant hypertension see below**</b></p> <ul style="list-style-type: none"> <li>• Admit to IPD with absolute bed rest.</li> <li>• If anxious try to calm patient.</li> </ul> <p><b>Treatment:</b></p> <ul style="list-style-type: none"> <li>• Repeat BP after 1 hour, if still high: <b>hydrochlorothiazide 25mg PO OD.</b></li> </ul> <p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>• Re-check BP QID.</li> <li>• <b>Monitor for signs of malignant hypertension.</b></li> <li>• Observe pattern of BP increase (all the time/ morning only/ irregular/ both arms/ lying-standing).</li> <li>• Record any symptoms when BP high.</li> <li>• Consider possibility of secondary HBP.</li> <li>• Check for complications: fasting dextrose, urine dipstick for blood/protein/glucose, consider ECG.</li> </ul> <p><b>Follow up:</b></p> <ul style="list-style-type: none"> <li>• Discharge when BP controlled and re-check BP in 1 week.</li> </ul>
>200	>120	<p><b>**Note: If signs of malignant hypertension see below**</b></p> <ul style="list-style-type: none"> <li>• Admit to IPD with absolute bed rest.</li> <li>• If anxious try to calm patient.</li> <li>• Discuss with doctor.</li> </ul> <p><b>Treatment:</b></p> <ul style="list-style-type: none"> <li>• Give <b>furosemide PO 20mg STAT</b> and repeat PRN.</li> </ul> <p><b>**Note: BP should go down in days and not in hours because lowering BP too quickly can cause: blindness, acute kidney failure, stroke, cardiac arrest**</b></p> <p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>• <b>Monitor for signs of malignant hypertension.</b></li> <li>• Monitor vital signs, urine output and GCS every hour.</li> <li>• Record any symptoms when BP high.</li> <li>• Check for complications: fasting dextrose, urine dipstick for blood/protein/glucose, consider ECG.</li> </ul> <p><b>Post-acute phase:</b></p> <ul style="list-style-type: none"> <li>• Start <b>hydrochlorothiazide PO 25mg OD.</b> <ul style="list-style-type: none"> <li>○ In the first 24 hours the DBP should be down to about 120mmHg.</li> <li>○ Over the next 2 days the DBP should be &lt;110mmHg.</li> <li>○ Over the next 2–4 days the DBP should be &lt;100mmHg.</li> </ul> </li> <li>• Discharge the patient on medication when BP is <math>\leq 160/100</math>mmHg for 2 days; if possible monitor BP daily for one week.</li> <li>• Continue frequent follow up for 2 to 3 months.</li> </ul>

Algorithm 1: Treatment of Chronic Hypertension in Adults





**MALIGNANT HYPERTENSION:**

If suspect malignant hypertension (BP >180 OR DBP >120 AND signs of damage to organs):

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

**Treatment:**

If able to give the patient **furosemide** 20mg PO before referring.

Aim at 25% BP reduction in first few hours then cautious reduction afterwards.

If unable to refer consider IV treatment – discuss with doctor.

**Note:** if suspect patient has had a stroke do not attempt to lower blood pressure, this would be dangerous.

## 6.2 HEART ATTACK AND ISCHAEMIC HEART DISEASE

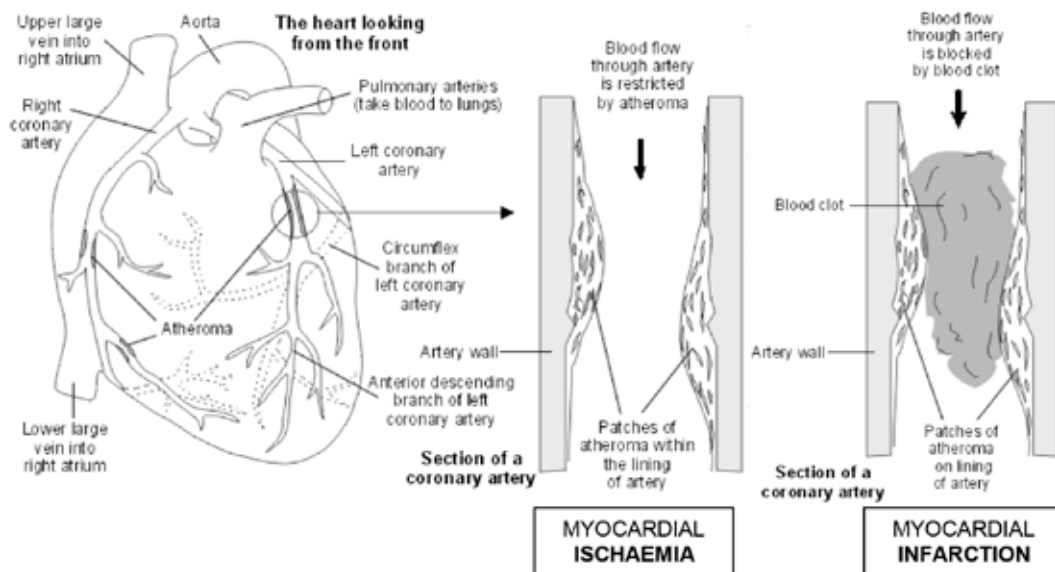
### DEFINITION

The heart is a muscle which has an important role in pumping 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. 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 ischaemic heart disease.

**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) = *angina*. Poor oxygen supply to the heart muscle due to a narrowing of the arteries in the heart.



### 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 HEART ATTACK (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.
- Associated with nausea, sweating, shortness of breath.

### DIAGNOSIS

#### Clinical

There is a specific blood test released by the heart that shows that there is damage to the muscle. This is not available at our clinics.

ECG shows ST elevation.



### TREATMENT

- This is an emergency.
- Give **Aspirin 300mg PO STAT**.
- **Refer immediately to hospital** – this patient needs stronger drugs to break down the clot and may need surgery to open up the arteries.

## 6.2.2 ANGINA (ISCHAEMIC HEART DISEASE)

### DEFINITION

Angina (also known as ischaemic heart disease) is when there is 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 which 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 at very high risk of developing into a heart attack.**

### DIAGNOSIS

#### Clinical history

ECG may show ST depression.

Check Hct – anaemia can cause chest pain.



### TREATMENT

#### Lifestyle:

Advise patients to:

- Reduce the amount of salt in diet.
- Avoid fatty foods / Eat more vegetables and fruit.
- Lose weight if overweight or obese.
- Alcohol: Advise the patient to stop or if unable to stop at least to reduce.
- Smoking: Advise the patient to stop or if unable to stop at least to reduce.
- Exercise at least 30 minutes most days of the week.

#### Medications:

Discuss with the doctor about what treatment is appropriate for each case.

**If unstable angina discuss with doctor about referral to hospital as there is a very high risk of developing into a heart attack.**

Treatments to be considered are:

- **Aspirin** (with **omeprazole** for protection of stomach): reduces stickiness of platelets so they don't get stuck to the inside of the blood vessels and to each other and block blood flow to the heart.
- Beta-blocker e.g. **Propranolol**: increase the force and rate of the heart pumping.
- ACE-Inhibitor e.g. **Enalapril**: prevent a build-up of fluid.
- Nitrates e.g. **Isosorbide Mononitrate**: relaxes blood vessels to allow good blood flow to heart muscle.

Treat hypertension (see p.33)

## 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
- Increased JVP
- Lots of creps bilaterally
- More oedema
- Low SpO<sub>2</sub>, fast RR
- Cannot breath when lying flat
- May have history of heart failure (or symptoms of heart failure)

**Also 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                     | <b>Check BP</b>      | 6. Myocardial infarction (heart attack)               | <b>Check ECG</b> |
| 2. Anaemia                          | <b>Check Hct/Hb</b>  | 7. Arrhythmia (irregular heart beat)                  | <b>Check ECG</b> |
| 3. Beriberi (Vitamin B1 deficiency) |                      | 8. Congenital heart disease                           |                  |
| 4. Hyperthyroidism                  |                      | 9. Valvular disease (heart valves too tight or loose) |                  |
| 5. Alcohol, drug addiction          | <b>Check lab TSH</b> |   |                  |

INVESTIGATIONS

- For all patients check: Hct, BP, TFTs, fasting dextrose.
- 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 at clinics on the border.
- You need to diagnose from symptoms and clinical exam.
- An improvement of symptoms with treatment also helps to confirm the diagnosis.
- If unsure if breathing problems due to other causes then a Chest X-ray may help you, discuss with the doctor to see if appropriate.

TREATMENT**ACUTE HEART FAILURE****Emergency Treatment:**

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR ACUTE HEART FAILURE
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	<b>Oxygen</b>
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	<b>Nebulisers if wheeze</b> Position patient: If dyspnoea <b>sit up right</b>
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	<b>IV cannula</b> (biggest size possible 16G or 18G) Take bloods e.g. <b>Hct, Creatinine, BUN, CBC, MS</b> , dextrose etc. <b>**If signs of heart failure DO NOT GIVE FLUID BOLUS**</b> Insert catheter and monitor fluid balance (fluid IN/OUT) every hour

<b>D</b>	Check dextrose Seizures Pain	<b>Give</b> diuretics e.g. <b>furosemide IV</b> Adults: <b>40mg</b> Child: <b>1mg/kg</b> (max 40mg) Repeat the same dose after 30 minutes if no improvement/has not passed urine Consider <b>vitamin B1 100mg IM</b> injection Give <b>digoxin PO</b> only if tachy-arrhythmia on ECG (irregular pulse >120 per minute)
<b>E</b>	AVPU/GCS Expose and examine	History, further investigations, treatment plan
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

### Vitamin B1

In all acute cases where Beriberi cannot be excluded, a treatment dose of **vitamin B1 100mg IM** should be considered. In our clinics vitamin B1 deficiency is relatively common. Diet advice or vitamin B1 tablets should be given to prevent Beriberi, especially in alcoholics and heart failure patients (see p.187).

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

### Post Emergency Treatment:

- Bed rest.
- Fluid restriction (max of 1.5 litre/day).
- Encourage patient to quit smoking.
- Weigh every day in IPD.
- Continue **furosemide** 20-40mg PO daily.
- Increase by 20 mg every 2 days to maintain the patient weight stable (maximum 120mg/day unless the patient has chronic renal failure).
- If oedema still continuing consider adding another diuretic e.g. **hydrochlorothiazide**.
- If available, start treatment with **enalapril**.

### 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

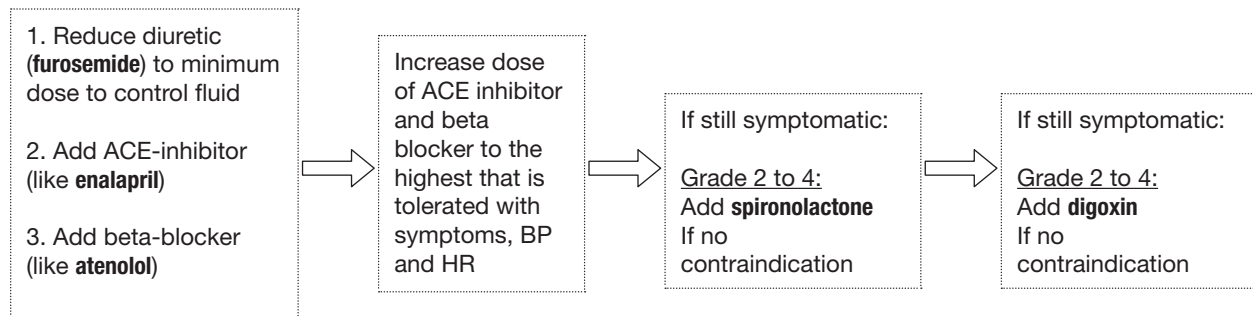
- Check heart sounds: listen for new murmur or gallop, and compare to previous heart sounds in lemma.
- Check BP, pulse, SpO2, weight.
- LHF signs: crackles in lungs. RHF signs: oedema, jugular veins enlarged, enlarged and painful liver.
- Signs of organ ischemia: headache, loss of memory, spleen pain.
- Grade the dyspnoea following the International American Heart Association:
  - Grade 1: **no symptoms**
  - Grade 2: **dyspnoea for major efforts** (describe the activity which caused the dyspnoea)
  - Grade 3: **dyspnoea for usual effort** (how many meters does the patient have to walk or how many kilos does he have to carry before he feels dyspnoea?)
  - Grade 4: **symptoms at rest** (shortness of breath even when doing nothing).

**Note:** Furosemide will make the patient feel better but will not increase how long they live for but ACE-I and beta blocker will increase the patient's life

#### Treatment:

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 (discuss with doctor).
5. Add ACE-I e.g. **enalapril**.

6. If no contraindications add cardio-selective beta blocker e.g. **atenolol**.
7. If still grade 2-4 consider adding **spironolactone**.
8. If still grade 2-4 consider adding **digoxin**.



#### CARDIAC MEDICATIONS

1. **Furosemide:** start 40mg PO OD, maintenance 20-40mg, if resistant oedema 80-120mg daily.
2. **Enalapril:** start with 2.5mg OD for 2 weeks, increase the dose every 2 weeks to aim for 10-20mg BID if tolerates (max 20mg BID) (**Note:** enalapril OD for High BP and BID for heart failure) monitor BP closely when giving with furosemide.
3. **Atenolol:** Start at 25mg OD, increase to 50mg OD if HR and BP allow. Monitor HR closely. Do not give if patient has asthma.
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 (given in divided dosages) then maintenance 125-250mcg.

#### When to change the treatment?

- **If the weight is increasing and oedema is appearing:** Increase the treatment or add new drug.
- **If the grade of the dyspnoea is rising:** Increase the treatment or add new drug.
- **If the BP is getting low (SBP <90mmHg):** decrease diuretic treatment and/or **enalapril**.
- **If you find digoxin intoxication signs:** stop digoxin for a few days and when signs have disappeared start again with lower dose.
- **If there is hyperkalaemia:** stop the enalapril and spironolactone.
- **If the patient is improving or stable: do not reduce the dose** of medication.

#### PREVENTION

Encourage patients to change their lifestyle. 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:

- Inflammation of more than one joint (**poly-arthritis**), especially the larger joints (knees, ankles, elbows, wrists)
- 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
- Heart murmur
- Congestive cardiac failure, enlarged heart
- Pericardial rub
- **Chorea:** rapid, involuntary, uncoordinated movements (especially of head, face, hands and feet), which disappear during sleep
- **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)
- **Erythema marginatum:** non-itchy, non-painful rash with a raised edge and clear centre, especially on trunk, thighs and arms. The lesions change frequently

Other symptoms: There can also be fever, abdominal pain, nose bleed or arthralgia (joint pain).

**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
- Polyarthrititis
- Chorea
- Subcutaneous nodules
- Erythema marginatum

**3) Minor criteria**

- Arthralgia
- Fever
- Increased CRP
- 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 penicillin**  
 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** for 10 days. If your patient is allergic to penicillin, give **erythromycin** 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.  
 Adult: 60-120mg OD for 2-3 weeks, then slowly decrease.  
 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**.
- If the patient develops **heart failure** see p.36.

**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.
- **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.



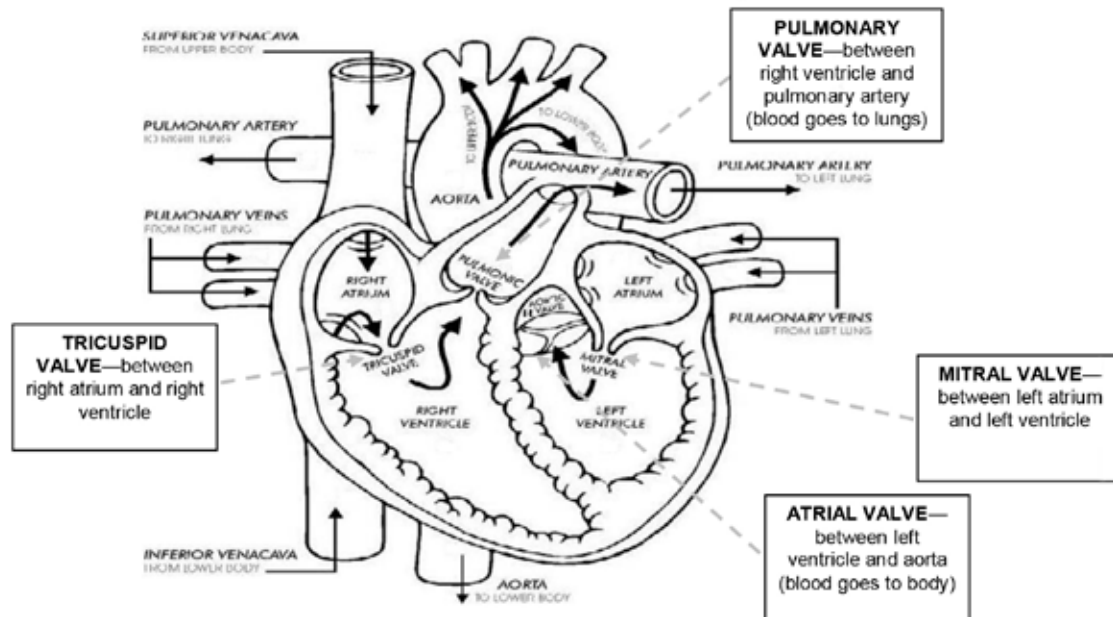
### How long to continue giving benzathine penicillin every 4 weeks?

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 connect 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.



### DEFINITION

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

### CAUSES

1. Congenital abnormalities
2. Infections e.g. Rheumatic fever, endocarditis, syphilis
3. 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

#### Clinical:

1. **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:

- Normal First heart sound: Caused by mitral and tricuspid valves closing
- Normal Second heart sound: Caused by pulmonary and aortic valves closing

**Systole:** the period between the first and second heart sounds

- o **Systolic murmur:** Murmur heard during systole. Can be caused by **aortic/pulmonary stenosis**, or **mitral/tricuspid regurgitation**

**Diastole:** the period after the second heart sound before the first heart sound

- o **Diastolic murmur:** Murmur heard during diastole. Can be caused by **mitral/tricuspid stenosis** or **aortic/pulmonary regurgitation**

2. **Examine for heart failure** e.g. oedema, raised JVP, creps both bases, raised RR, low SpO<sub>2</sub>, cyanosis
3. **Echocardiogram (heart ultrasound):** Is the only definitive way of knowing 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. See heart failure section for treatment if suspect heart failure p.36

## 6.6 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

1. **Bacterial (most common)**
2. Fungal e.g. candida (more common in immunosuppressed patients)
3. 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 particularly if there are risk factors.

Often symptoms are non-specific:

- |                              |                       |
|------------------------------|-----------------------|
| • New murmur on auscultation | • Weight loss         |
| • Fever                      | • Shortness of breath |
| • Chills                     | • Cough               |
| • Headache                   | • Night sweats        |
| • Muscle pain                | • Joint pains         |

#### DIAGNOSIS

Blood cultures should be taken when the patient has fever 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).
- Surgery may be needed.
- If possible do frequent ECGs to monitor for any damage to the heart.
- If suspect discuss with the doctor about which antibiotics to use as antibiotic choice depends on the likely organism which is affected by the risk factors.



## 7

## CHAPTER 7: DENTAL DISEASES

## 7.1 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. Here is a brief overview of some conditions.

DENTAL CARIESDEFINITION

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

RISK FACTORS

1. Sugar rich diet
2. Poor teeth strength
3. Infrequent or no teeth cleaning.

SIGNS AND SYMPTOMS

- Black colouration 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**). If swelling is reduced refer to dental team.
- If there is no swelling but constant pain, refer to the dental team.
- The most effective treatment is to fill the cavity OR to extract the tooth. Refer to trained dental team.

PREVENTION

Daily cleaning of the teeth and gums.

.....  
**Note** – new guidelines say that patients with heart problems do not need antibiotic cover when having dental treatment  
 .....

GUM DISEASES

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% mouthwash or salt water mouthwash.

PREVENTION

Daily cleaning of teeth and gums.

Removal of calculus (dental plaque) by dental team.

**b) Peridontitis**

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**

Extraction of the affected tooth.

PREVENTION

Daily cleaning of teeth and gums

Removal of calculus (dental plaque) by dental team.

## 7.2 STOMATITIS

### 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
- Nausea, vomiting.

### CAUSES OF STOMATITIS

1. **Fungal** e.g. candidiasis (oral thrush) white patches on tongue, inside cheek (may spread to pharynx) - occurs frequently in infants, malnourished children, diabetic patients and immunosuppressed patients e.g. HIV, cancer. Can also occur if patients who take steroid inhaler e.g. budesonide 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:
  1. **Fungal infections:** like thrush (*Candidiasis*): **Nystatin** give 1 lozenge 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). Oral suspension should be swilled around mouth and then swallowed.
  2. **Viral infections:** wash the mouth with **warm salty water** and treat with **gentian violet**. If there is secondary bacterial infection, wash mouth with **chlorhexidine 0.2%** and treat with **amoxicillin**.
  3. **Vitamin Deficiencies:** replace deficiencies (see malnutrition chapter)

**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 (take water in mouth, and spit out water – do not swallow) after each use. Educate about good diet.

## 7.3 TRAUMA

If a permanent tooth is knocked out it should be replaced (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 permanent tooth back. Make sure that patient can close his mouth in normal position. If not, align the tooth in place.
- Advise the patient to avoid solid food for 2 weeks so must have soft food only.

## CHAPTER 8: EAR DISEASE

Note: For photographs of conditions see p. 300

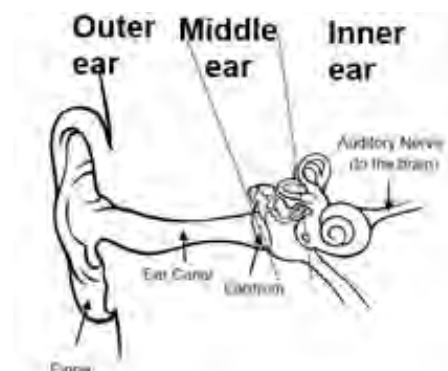
### 8.1 OTITIS

#### DEFINITION

Otitis is an infection of the ear. There are two areas of the ear that can be affected:

1. Otitis Externa (outer ear)
2. Otitis Media (middle ear)

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



### OTITIS EXTERNA

See photo p. 300

#### DEFINITION

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

#### CAUSES

1. Often no cause
2. Trauma to ear canal
3. Foreign body
4. Skin disease e.g. eczema

#### SYMPTOMS

- Pain or itching of ear
- Ear feels full
- 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 (something that should not be there e.g. a seed)

#### TREATMENT

- **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.
- **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 flimsy paper that will fall apart in the ear.
  - Place the wick in the child's ear until the wick is wet.
  - Replace the wet wick with a clean 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.
- Explain need to avoid getting the ear wet e.g. no swimming, be careful when washing
- 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).
- Apply **gentian violet** with a cotton bud OD.
- Repeat this local treatment every day until cured (usually 3 to 5 days).
- Treat the fever and the pain with **paracetamol**.
- If no improvement after 5 days, give PO **cloxacillin**.



Wick for drying ears

**ACUTE OTITIS MEDIA**

See photo p. 300

**DEFINITION**

Acute bacterial or viral infection of the middle ear (behind the ear drum). Uncommon 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 perforation = **viral otitis** if have URTI symptoms e.g. sore throat, 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 (as it may be perforated).

**Antibiotics:**

- Most cases of acute otitis media are caused by viruses so not everyone needs antibiotics.
- If NO RISK FACTORS improvement of symptoms by itself often occurs so if it is possible to re-examine the ear within 48-72 hours then **do not give antibiotics on first presentation\***.
- **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

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**\*\*Note:** if concerned that the child will not follow up or the family will try to buy antibiotics somewhere else then give antibiotics on first presentation

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**1<sup>st</sup> Line: Amoxicillin**

<b>Adults:</b>	1g TID	<b>Child 5–12yrs:</b>	500mg TID
<b>Child 12–18yrs:</b>	500mg TID; in severe infection 1g TID	<b>Child 1–5yrs:</b>	250mg TID
		<b>Child 1m–1yr:</b>	125mg TID

Treat for 5 days, continue for longer if severe infection.

2<sup>nd</sup> Line: If after 48 hours the fever and/or ear pain is continuing then switch to **co-amoxiclav**.

**CHRONIC (SUPPURATIVE) OTITIS MEDIA**

See photo p. 300

**DEFINITION**

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 like Acute Otitis Media (see above)

- **Dry mop the ear** (see above)
- **Do not send ear swab**
- **Apply antibiotic drops**

- o **Ciprofloxacin**
  - \* Child: 2 drops BID until no more pus/discharge usually 2-4 wks
  - \* Adult: 4 drops BID for 2-4 wks
- o If no other option consider: **chloramphenicol** (2-3 drops 2-3 times per day)
- o Apply drops after cleaning ear
- o 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 no local treatment is available, use amoxicillin oral for 2 weeks.
- **Note: cadexcin** (dexamethasone and neomycin) (if available), is another option – it can cause **ototoxicity (deafness)**, use for no more than 2 weeks, discuss with doctor before using, may need to trial PO antibiotics before giving cadexcin.

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## COMPLICATIONS

### **1. Mastoiditis:** (infection of the bone behind the ear)

Sometimes happens after otitis. There is severe pain with swelling and tenderness behind the ear. This needs referral to a hospital for surgery. Treat with **IV ceftriaxone** and **ciprofloxacin** before referral.

### **2. Brain abscess/meningitis:**

May occur after recent otitis media. Think if low GCS, neck stiffness, focal neurological signs e.g. facial palsy. (See p.124/130 for treatment)

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## PREVENTION

Parents of children with otitis should stop smoking. Prompt treatment of acute ear infections may reduce the risk of development of chronic otitis media and mastoiditis.





## CHAPTER 9: ELECTROLYTE ABNORMALITIES

### DEFINITION

Our bodies carefully control the amount of electrolytes. If they are too high or too low, this can be dangerous. This can happen because of diseases, for example hyperkalaemia (high potassium) because of renal failure. It can also happen because of medication that we give, for example hypokalaemia (low potassium) because of furosemide. Sometimes abnormal electrolytes can be an emergency. The most common causes seen at clinics on the border are listed below.

HYPO = too low HYPER = too high

**Note:** It is important to check individual reference ranges for each lab and machine as they can be slightly different. The reference ranges used here are for SMRU biochemistry machines.

### 9.1 POTASSIUM (normal 3.5-5.1mmol/L)

Potassium is important for the heart to work.

**HYPERKALAEMIA = HIGH POTASSIUM (>5.1mmol/L)**

High potassium can be an emergency as it can cause abnormal rhythms in the heart.  
Do ECG > 6.5 is an emergency or >6 with changes on the ECG

### CAUSES

1. Renal Failure
2. Medications e.g. ACE-inhibitor (e.g. enalapril), spironolactone
3. Endocrine diseases e.g. Addison's disease (failure of adrenal gland)
4. Haemolysis (breakdown of red blood cells that release potassium)
5. Pseudohyperkalaemia (if red blood cells break down when taking blood then the level of potassium can be falsely high)

### SIGNS AND SYMPTOMS

- Non-specific tiredness, muscle weakness
- Abnormal heart rhythm – may cause tachycardia, palpitations, chest pain
- ECG shows peaked T waves



### TREATMENT

- Stop any medications that may be causing the problem
- If renal function is normal and no other obvious cause consider repeating the potassium as it may be falsely high from the breakdown of the red blood cells when taking blood.
- If potassium >6.5 or >6 with changes on ECG: there is a high risk of sudden death:
  - **Salbutamol** nebuliser 5mg (this helps to lower the potassium)
  - **Calcium Gluconate** 10% 10ml SLOW IV over at least 10 minutes (this protects the heart)
  - To lower the potassium this patient needs **insulin** → this is not available at many clinics so this patient needs **IMMEDIATE REFERRAL**

**HYPOKALAEMIA = LOW POTASSIUM (<3.5mmol/L)**

### CAUSES

1. Medications e.g. furosemide, hydrochlorothiazide
2. Gastrointestinal loss e.g. diarrhoea (also vomiting)
3. Loss through skin e.g. burns
4. Low intake in diet e.g. malnutrition
5. Endocrine diseases e.g. Conn's syndrome (too much aldosterone production)
6. Low magnesium

### SIGNS AND SYMPTOMS

- Severe hypokalaemia will cause muscle weakness, myalgia, muscle cramps and constipation
- Paralysis can occur



**TREATMENT**

- Stop any medications that may be causing the problem
- 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:

<b>Mild Hypokalaemia</b>	<b>3.0-3.4</b>	PO one tablet* BID for 1 week and re-check potassium
<b>Moderate hypokalaemia</b>	<b>2.5-3.0</b>	PO two tablets* TID for 3 days and re-check potassium If not increasing, give <b>magnesium</b> , then try two tablets QID and consider admission for IV potassium
<b>Severe hypokalaemia</b>	<b>&lt;2.5</b>	<b>Potassium IV</b> replacement and <b>magnesium IV</b> , repeat potassium daily <b>Note:</b> IV replacement is dangerous and should be done with cardiac monitoring. It can be considered ONLY after discussion with the doctor  <b>**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**</b>

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

**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 potassium per hour).
- If magnesium unknown/cannot be measured and severe hypokalaemia 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 to ensure that do not accidentally give faster than 10mmol/hour.
- **IV potassium given too quickly can kill.**
- IV potassium should only be done with close and good medical supervision.
- Maximum rate = 10mmol/hour and maximum concentration for peripheral IV is 40mmol/litre (to prevent cardiac arrhythmias and minimise phlebitis (inflammation of the vein)).

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If cannot correct the potassium, then the magnesium may be low, you need to correct the magnesium first before the potassium can be corrected

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**9.2 CALCIUM** (normal 2.15-2.55mmol/l)**HYPERCALCAEMIA = HIGH CALCIUM (>2.55mmol/l)**

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

**CAUSES**

1. Medications e.g. hydrochlorothiazide
2. Renal failure
3. Cancers e.g. bone, lung
4. 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 be causing the problem
- The most important treatment is to rehydrate with IV fluids (NSS)
- Diuretics e.g. furosemide can also help to decrease the calcium (discuss with doctor)
- More complex medications e.g. bisphosphonates can be used but may not be available at clinics on the border

**HYPOCALCAEMIA = LOW CALCIUM (<2.15mmol/L)**CAUSES

1. Low oral intake
2. Medications e.g. diuretics
3. Low vitamin D

SIGNS AND SYMPTOMS

- Tingling around the mouth and lips and in the hands and feet
- Tetany (strong contractions of the hands and large muscles)

TREATMENT

- Stop any medications that may be causing the problem
- Increase dairy products e.g. milk
- Calcium PO replacement
  - Calcium carbonate (**Calcium carbonate** 500mg/1000mg tablets) OR
  - Calcium carbonate combined with Vitamin D3 (**Calcium carbonate** 500mg + **Vitamin 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 – can repeat until patient symptoms stop

**9.3 SODIUM** (normal 136-145mmol/L)

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

.....

**HYPERNATRAEMIA = HIGH SODIUM >145mmol/L**CAUSES

1. Dehydration
2. Endocrine disorder e.g. diabetes insipidus (problem with controlling water balance in the body)

SIGNS AND SYMPTOMS

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

TREATMENT

- Careful rehydration with D5W

**HYPONATRAEMIA = LOW SODIUM <136mmol/L**CAUSES

1. Fluid overload e.g. heart failure, ascites
2. Medications e.g. furosemide
3. Endocrine problems e.g. SIADH, hypothyroidism
4. Prolonged vomiting & diarrhoea
5. Drinking too much water (psychogenic polydipsia)

SIGNS AND SYMPTOMS

- Nausea, vomiting, headache, loss of appetite
- Lethargy, confusion, memory loss
- Convulsions, coma

TREATMENT

- Stop any medications that may be causing the problem
- Treatment depends on the cause, discuss with the doctor
- **Sodium levels should not rise by more than 8mmol/L over 24hours**



# CHAPTER 10 ENDOCRINE DISEASES

## 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 in adult life (>30 years), often have risk factors (see below), can usually be managed with tablets. If severe, may need insulin treatment.

**Risk Factors** associated with type 2 Diabetes are: positive family history, BMI > 23 (see p.183) and obesity (see p.183), 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 (see below)



### DIAGNOSIS

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

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	> or equal to 200mg/dL (> or equal to 11.1mmol/l)

\*Conversion 1mmol/L = 18mg/dL, 1mg/dL= 0.055mmol/L.

### INVESTIGATIONS (if available)

1. Fasting blood glucose
2. Oral glucose tolerance test (for pregnant women only)
3. Urine dipstick – protein, glucose
4. Biochemistry – BUN, Creatinine
5. 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 being diagnosed with diabetes before.\*\***

**HYPOGLYCAEMIA <70mg/dL (=3.8mmol/l) Note: <45mg/dL(=2.5mmol/l) is severe**

SIGNS AND SYMPTOMS:

- Sweating, hunger, tremor, dizziness, drowsiness, aggressive/irritable, confusion, convulsion, coma

TREATMENT:

- If dextrose 45-70mg/dL:
  - Give oral sugar solution (water mixed with sugar) or sweet drink to prevent severe hypoglycaemia.
- If dextrose <45mg/dL:
  - **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 using insulin correctly, or other illnesses that put a stress on the body. DKA can be life-threatening.

SIGNS AND SYMPTOMS:

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

DIAGNOSIS: To diagnose DKA there must be all 3:

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 in 1 hour
  - Children 10ml/kg in 1 hour (the risk of fluid overload is higher in children)
- Need **insulin**: discuss with doctor about 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 normal diabetes medication e.g. because of illness. It causes severe dehydration of 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:

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

## TREATMENT

The aim of diabetes treatment is to lower the blood sugar to normal levels, which will make the patient feel better and prevent long term damage.

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

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### 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 when diabetes is present only in pregnancy – see *obstetric guidelines*). Diabetes can be controlled. Explain that there are drugs which can lower the blood sugar and that there are also some things that the patient can do to help lower the blood sugar level.

### 2. Life style treatment

It is important for all diabetics to make changes to 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)
- Be aware that rice and noodles raise the blood sugar.
- If you can, choose wholegrain varieties (like brown rice if available/affordable), 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

##### • Reduce Fat:

- Try to steam instead of fry
- Use chicken > beef > pork – remove fatty part and skin

##### • Reduce Sugar

- e.g. sweets, biscuits, fruit juices, soft drinks like coca cola, sugar cane, honey, 3 in 1, sweet tea, ovaltine/milo

##### • Reduce Salt

- Reduce salt in cooking, less dry salty fish

- **Alcohol:** Advise the patient to stop or if unable to stop at least to reduce

- **Smoking:** Advise the patient to stop or if unable to stop at least 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.




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

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### 3. Footcare advice

People with diabetes often have problems with the nerve and blood supply to their feet. This means that they may not be able to feel if they have trauma to their feet and if they get a trauma/infection it will be difficult to treat and may heal very slowly. Therefore it is **important for patients to check their feet each day** to look for sores, cuts, redness or any signs of 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. To prevent trauma make sure nails are cut, wear shoes, particularly comfortable ones, if possible.

### 4. Medication

#### DIABETIC MEDICATION

Start diabetic medication if the dextrostick **>200 mg/dL (11.1 mmol/L)**, or lifestyle treatment is not working.

The diabetic medication will need to be started by a doctor or senior medic.

**Make sure 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.

Some diabetic medications are:

Name of Drug	START DOSE	MAX. DOSE	NOTES	Contraindications	Side effects
<b>METFORMIN</b>	500mg BID	1g BID	Give with meals Preferable for patients who are overweight	Liver disease, renal failure, hypoxia (risk of lactic acidosis)	<b>Note:</b> can have gastrointestinal side effects that can be reduced if taken with food
<b>GLIBENCLAMIDE</b>	5mg OD Elderly: 2.5mg OD	15mg OD	Give with breakfast	Patients who do not eat meals regularly, liver/renal failure, pregnancy	<b>Note:</b> can cause hypoglycaemia if the patient does not eat 3 regular meals

1. Start with **metformin** 500mg BID
2. After 1-2 weeks increase to **metformin** 1g BID
3. If after 1-2 weeks the blood sugar is not normal **ADD glibenclamide** 5mg OD with breakfast
4. If after 1-2 weeks the blood sugar is not normal increase to **glibenclamide** 10mg OD
5. If after 1-2 weeks the blood sugar is not normal increase to **glibenclamide** 15mg OD
6. If blood sugar not controlled this patient is at high risk of diabetes complications and may need insulin which is not available in many clinics
  - Discuss with the doctor about referral
  - Explain to the patient that they must seek healthcare at hospital if they are able to. This is to avoid becoming unwell and to avoid complications in the future
  - If they cannot get insulin, continue the oral medication, but advise the patient that they are at risk for complications of diabetes as their dextrose is poorly controlled.

If the patient takes diabetic medication but does not eat, or does not eat regularly, he will be at risk of hypoglycaemia (too low blood sugar): explain this very carefully to the patient, teach them and the family how to recognise symptoms of hypoglycaemia and how to treat it (eat sugary drink/food).

#### BLOOD PRESSURE MEDICATION

- In diabetic patients should aim for SBP less than 130 and DPB less than 80 (BP <130/80mmHg)
- ACE inhibitor e.g. enalapril recommended first line anti-hypertensives in diabetes (beta blockers are not recommended)

#### 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 weekly 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 particularly comfortable ones 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 hypertensive medication if high
- Look at feet for infection, wounds, test for numbness

##### Every 12 months:

- Urine dipstick for protein (kidney damage).
- Look for signs of heart failure.

If possible test vision in Eye Clinic; look for cataract.



**Check random blood sugar level:**

	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 (see p.22) Check if patient is eating regularly. If yes: reduce medication If not: give education	Consider if patient has diabetes emergency (see p.22) Increase medication. Find and treat infections (for example UTI) Give diet education

**Note:** Changes in medicine dose should be done by a doctor or senior medic.

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 handbook* for treatment

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 cases of acute severe malaria, a dextrose < 40mg/dL (2.2mmol/L) is diagnosed as hypoglycaemia. (See *malaria guidelines*))

CAUSES

1. Diabetic medication dose is too high.
2. A diabetic person took his/her medication but then did not eat.
3. Malaria (especially in pregnant women and/or undergoing quinine treatment).
4. Other infections.
5. Non diabetic medications e.g. beta blockers

SIGNS & SYMPTOMS

- Sweating, hunger, tremors, dizziness.
- More severe: drowsiness, aggressive or irritable behaviour, convulsions and coma.

DIAGNOSIS

- Check blood sugar to confirm diagnosis.
- Find the underlying cause (malaria or other infection).

TREATMENT

- If dextrose 45-70mg/dL:
  - Give oral sugar solution (water mixed with sugar) or sweet drink to prevent severe hypoglycaemia.
- If dextrose <45mg/dL:
  - **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.
- If on diabetic medication review the dose with a doctor or senior medic.
- Treat any other cause e.g. malaria, infection.

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 hormone-producing gland located just below the Adam's Apple in the neck. It produces two thyroid hormones (thyroxine/T<sub>4</sub> and triiodothyronine/T<sub>3</sub>), which circulate in the bloodstream and control the metabolism. Thyroid hormones influence almost every other organ system in the body. They tell the organs how fast or slow they should work, and tell the body systems when to use energy (e.g. consume oxygen and produce heat). The amount of hormones the thyroid produces is controlled by the Thyroid-Stimulating Hormone (TSH) which is produced by the pituitary gland.

You can detect the two main thyroid disorders by measuring TSH and F-T<sub>4</sub> (free T<sub>4</sub>) in the blood of a patient.

TSH	F-T <sub>4</sub>	Conclusion
Normal	Normal	No thyroid problem (euthyroid)
↑	↓	Hypothyroid
↑	Normal	Sub clinical hypothyroid
↓	↑	Hyperthyroid
↓	Normal	Sub clinical hyperthyroid

### 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.

#### DIAGNOSIS

- Clinical: Feel the thyroid gland (goitre, nodules), pulse, look for dry skin, oedema
- Laboratory test: TSH, FT-4 for diagnosis, TSH only for follow up of treatment.

#### TREATMENT

##### 1. SUB CLINICAL HYPOTHYROID (high TSH, normal F-T<sub>4</sub>):

Wait and see, repeat blood tests every year.

##### 2. HYPOTHYROID (high TSH, low F-T<sub>4</sub>):

**If <50 years AND no history of ischaemic heart disease (angina):**

- Start thyroxine 50mcg OD
- Increase after 4 weeks to 100-150mcg 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

**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

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**Note:** thyroxine dose is micrograms (mcg) not milligrams (mg) e.g. 50mcg = 0.05 mg

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#### 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 2<sup>nd</sup> 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.

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**Note** – thyroid medication will take at least 4 weeks to work so when changing medication do not check the TFT before 4 weeks

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**Note:** Hypothyroidism in pregnant women should be monitored carefully, with frequent thyroid function tests. Delivery should not take place at home and the neonate should be observed carefully for signs of thyroid disease. For neonatal hyper or hypo thyroid diagnosis and treatment, please refer to SMRU neonatal guidelines.

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## 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 SYMPTOMS:

- |               |                                  |
|---------------|----------------------------------|
| • Diarrhoea   | • Sweatiness                     |
| • Nervousness | • Exophthalmia (protruding eyes) |
| • Weight loss | • Tachycardia, palpitations      |
| • Feel warm   | • Tremors in the hands.          |

### DIAGNOSIS

- Clinical: check pulse rate, feel thyroid gland (goitre, nodules).
- Laboratory test: TSH and FT-4 (after 1 month then every 3 months).
- Hydatidiform molar pregnancy can cause symptoms that look like hyperthyroidism (*see obstetric handbook*).

### TREATMENT

- For treatment in pregnant women, refer to obstetric guidelines. Hyperthyroidism in pregnancy can cause irreversible mental retardation in the fetus/infant.
- Check liver function tests (ALT, ALP, Bil) before starting propylthiouracil

**Propylthiouracil (PTU)** 50mg tablet (this is an anti-thyroid drug which will stop the thyroid malfunction).

- Start **PTU** 200-400mg per day in divided doses e.g. 2 tablets BID – 4 tablets BID
- Check thyroid function (TSH, FT-4) and liver function tests after 1 month, 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 not hyperthyroid anymore. Follow clinical symptoms (see follow up below).
- There is a risk of hepatotoxicity. Advise patients on how to recognise symptoms of liver disease (anorexia, nausea, vomiting, fatigue, abdominal pain, jaundice, dark urine, itching)
- For rapid symptomatic treatment of tachycardia and palpitations give **propranolol** 40mg OD then increase to 40mg TID if required.

### FOLLOW UP

Initial phase (3 months): every month.

After initial phase: every 2 -3 months.

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**Note:** Hyperthyroidism in pregnant women should be monitored carefully, with frequent thyroid function tests. Delivery should not take place at home and the neonate should be observed carefully for signs of thyroid disease. For neonatal hyper or hypo thyroid diagnosis and treatment, please refer to SMRU 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.

### 10.3.3 GOITRE

#### DEFINITION

A goitre is an enlargement of the thyroid gland, which appears as a large swelling at the front of the neck. Endemic goitre occurs in areas where iodine in the diet is deficient. Iodine is essential for the production of thyroid hormone and deficiency impairs the making of it. To compensate, the gland increases in size. Hyper- or hypothyroidism may occur. Regular consumption of foods such as cassava, cabbage or turnips also cause goitre; it is also made worse by smoking and pregnancy.

#### SIGNS AND SYMPTOMS

- Swelling of the thyroid.
- Hypo or hyper thyroidism. Iodine deficiency in pregnancy: increased fetal and perinatal mortality.
- In children: physical and mental retardation

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.

Laboratory test: TSH and FT-4 if symptoms of hyper or hypo thyroidism.

#### 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 surgical intervention.

#### TREATMENT

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

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**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.

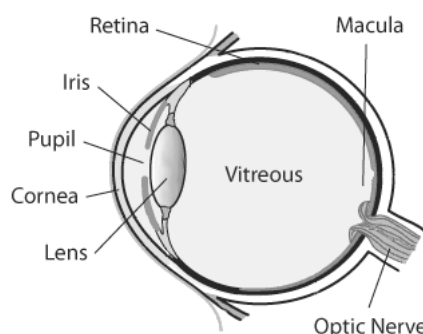
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#### PREVENTION

The best way to prevent goitre or iodine deficiency is to encourage consumption of iodized salt (**note:** this is available in the food basket supplied by TBBC). If there is no iodised salt available, provide people living in iodine deficient areas with iodised oil.

# CHAPTER 11: EYE DISEASES

**\*\*Note:** Some eye diseases can be treated at all clinics, and some diseases need treatment from centres that have specially trained medics and doctors such as Mae Tao Clinic or Mae Sot Hospital.\*\*



## 11.1 POOR VISION (Refraction error)

Poor vision is a common problem. A person with poor vision may be suffering from a disease of the eye, or is simply in need of eyeglasses. Most of the conditions that cause poor vision can be detected by careful examination of the eye (cornea scars, cataracts, obvious infections etc.).

Use of a **PINHOLE** will help to establish whether a person needs eyeglasses. To make a pinhole make a very small hole in a piece of paper. If vision improves when looking through a pinhole, then eyeglasses are needed.

### 1. Poor near vision (Longsightedness)

Commonly known as 'longsightedness', this condition affects the ability to see close-up objects, and tends to get worse with age.

**Poor near vision can be divided into two groups depending on age:**

- People under the age of 40 who develop poor near vision are diagnosed with **Hyperopia**. For this condition, vision can be corrected with plus power lens eyeglasses.
- Almost all people over the age of 40 will suffer from poor near vision. Activities such as reading and sewing become difficult or impossible. The loss of close-up vision is part of the natural ageing process, and is called **Presbyopia**. For this condition, vision can be helped with reading glasses (plus power lens eyeglasses).

### 2. Poor long-distance vision (Shortsightedness)

Commonly known as 'shortsightedness', this condition causes distant objects to be blurred, whilst close-up objects can be seen clearly e.g. schoolchildren who cannot read the blackboard. This is called **Myopia**. For this condition, vision can be corrected with minus power lens eyeglasses.

### 3. 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 (see p. 186).

## 11.2 INFECTIONS

### CONJUNCTIVITIS

See photo p.300

#### 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, do not respond to TEO, usually disappear within one week without complications. In the rainy season there are often outbreaks of viral conjunctivitis. For example, this may affect up to 20-30% of the camp population.
- **Allergic conjunctivitis:** lots of tears, eyelid oedema, itching, both eyes, 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 discuss with doctor)

.....  
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

Clinical.

.....  
**Note:** 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.

.....  
Refer serious eye infections, infections involving the cornea and infections not responding for treatment  
to where they have trained specialists in eyes e.g. Mae Tao Clinic, Mae Sot Hospital  
.....

#### PREVENTION

Personal hygiene, wash hands regularly.

**TRACHOMA**

See photo p.301

**DEFINITION**

Trachoma is a highly contagious eye infection caused by the bacterium *Chlamydia trachomatis*. It is no longer common on the border. 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, this disease 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.
- This scarring can cause loss of vision, and make the eye more likely 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 p.301*).

Diagnosis should be made by a medic who has been trained in eye care so refer the patient to a facility such as Mae Tao Clinic or Mae Sot Hospital if suspect.

**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 fails: 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, as 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).

- In most cases surgery is helpful. These patients should be referred to a medic who has had eye training.
- While waiting for surgery if can do regular follow up can tape eyelashes to eyelid using thin strip of sticking plaster. This protects the cornea but it is important that the eyelid can open and close perfectly. Replace the plaster when it starts to peel off (usually once a week), continue for 3 months.

**\*\*Note:** previous advice of removing eyelashes with forceps 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.

**SURGERY**

**ANTIBIOTICS** (to treat the infection)

**FACIAL CLEANLINESS** (hygiene)

**ENVIRONMENTAL CHANGE** (increase access to clean water and sanitation)

**PREVENTION**

Health education on hygiene and sanitation.

**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.**

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**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.

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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 do not have special anaesthetic eye drops can use local anaesthetic e.g. 2-3 drops lignocaine instead.  
(**Note:** if only have lignocaine/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 then look at the eye under a blue light for any corneal scratches: these will show up in yellow.

See photo p. 300

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.
  - Mostly, these serious injuries result in blindness or loss of the eye.

**11.4 CORNEAL ULCERS**

See photo p. 300

DEFINITION

An ulcer on the cornea of the eye.

CAUSES

- Corneal ulcers may be caused by damage to the eye. This might be very small like a foreign body in the eye (most common cause)
- They may be bacterial, or fungal, and can be very difficult to differentiate between the two causes clinically.
- The history is important: if the injury is caused 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

- 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 and need to be referred for specialist treatment.

**11.5 DISEASES OF THE EYE**

**Note:** List all known cataract and other eye surgical patients in the eye surgery register. For each patient, list the name, age, sex, house number, diagnosis and vision of each eye. Record pupil reaction to light. Having an eye surgery register allows better planning of eye surgery visits. This register helps you to find the patients quickly and will save the visiting eye surgeon's time.



**CATARACT**

See photo p. 300

**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. If have an ophthalmoscope it will be difficult to see the back of the eye.

**TREATMENT**

There are no medicines that can treat cataract. Only surgery will help so referral to eye specialist is needed.

**PTERYGIUM**

See photo p. 300

**DEFINITION**

Pterygium is the name for special tissue growth on the cornea. It is usually triangular in shape with the point pointing towards the centre of the cornea. Most of the time the pterygium will grow onto the cornea from the nasal (nose) side of the eye. A pterygium can be white in colour, although it can also present like conjunctiva or muscle tissue. It is not known why people develop pterygium. 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.

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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 often comes back again after surgery (in these cases it will grow back faster). Treatment for a small pterygium is to reassure the patient that this is not an infection or serious (tumour) growth.
- **Large pterygium:** requires surgery, as if left it could reach the pupil and interfere with vision. When a pterygium reaches 2 or 3 millimetres from the edge of the pupil, the patient should be placed on the surgery list.

**GLAUCOMA****DEFINITION**

Glaucoma is 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:

1. **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)
2. **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

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

**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

- 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.

STRABISMUSDEFINITION

Strabismus (squint) is when the eyes do not look in the same direction.

CAUSES**In children:**

- 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 squint in an infant.
- The eyes may be squinting but the child is able to move both eyes in all directions when tested.
- Often these squints are because the child needs eyeglasses.
- The main problem is that the eye that is squinting may become lazy without specialist treatment.
- A few cases of squint will occur when there is a defect in the eye causing loss of vision in that eye.
- ALL CASES of children with a squint should be referred to an eye specialist.

**In adults:**

- Squints occur suddenly and are due to paralysis of one of the muscles and when tested the eyes will not be able to move in all directions normally.
- This may be caused by something very simple or be a sign of serious illness.
- These cases should also be referred to an eye specialist.

DIAGNOSIS

1. Shine a torch from about one metre and observe the central corneal light reflex, it should appear in the same place in both eyes. The light will be nearer the nose in a divergent squint and further away in a convergent squint.
2. Shine the light in to the eyes while asking the patient to look at your nose, cover the eye you think is normal with your hand and observe the one you think has a squint to see if there is any movement of the eye to focus. If it does not move, there is either no squint or there is no vision in that eye.
3. Children old enough to cooperate with a visual perception test should be assessed.

TREATMENT

If you detect a squint, then refer the patient to an eye specialist. For children if it is not treated by 6 years of age the child can lose sight permanently in that eye.

## 11.6 XEROPHTHALMIA

DEFINITION

Vitamin A deficiency is a major problem on the border (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 left untreated it can progress to irreversible blindness.** Vitamin A deficiency can occur in anyone, but usually affects children between 1 and 6 years old. Most babies who are breast-fed will not develop 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.
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 is in danger of contracting bacterial or viral infections known as corneal ulcers. These can cause holes on the cornea (keratomalacia). If a patient contracts a corneal ulcer, the eye can suffer permanent vision loss.
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

- All cases of corneal dryness should be given 2 tubes of TEO to prevent the cornea from becoming infected. Apply BID and protect eye with an eye pad after each application.
- All patients seen with corneal ulcers/ keratomalacia must be seen by a doctor.
- Vitamin A treatment (*also see Vitamin A deficiency chapter p.186*):

#### Children less than 6 months

Day of diagnosis	(D 1)	50,000 IU
Next day	(D 2)	50,000 IU
One week later	(D 8)	50,000 IU

#### Children between 6 and 11 months (<8 kg)

Day of diagnosis	(D 1)	100,000 IU
Next day	(D 2)	100,000 IU
One week later	(D 8)	100,000 IU

#### Children age 1 year and older and adults (>8 kg)

Day of diagnosis	(D 1)	200,000 IU
Next day	(D 2)	200,000 IU
One week later	(D 8)	200,000 IU

#### 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.

#### • Treatment for pregnant woman:

\* In case of night blindness and Bitot's spot:  
Vitamin A 10,000 IU PO daily OR 25,000 IU PO per week  
for at least 4 weeks

\* In case of corneal dryness and corneal ulcer/  
keratomalacia risk of blindness outweighs risk to baby:  
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 only be given 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).

.....  
**\*\*Note:** carefully document when give child vitamin: overdose can cause raised ICP,  
impaired consciousness, convulsions.\*\*

**\*\*Note:** Give all children with measles vitamin A.\*\*  
.....



## 12

## CHAPTER 12: FAMILY PLANNING AND GENDER BASED VIOLENCE

## 12.1 FAMILY PLANNING GUIDELINES

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

- Ask the patient how many children he/she has?
- Does she want more children? How long does she want to wait before the next pregnancy?
- Has the patient had a recent abortion?
- Does the patient have a history of migraine?
- Is the patient breast-feeding at the moment?
- Does the patient know all the different forms of family planning?
- Is she afraid of sterilisation?
- Check for a history of abnormal vaginal bleeding or discharge.
- On examination, check for abnormalities of blood pressure, liver, breast, or cervix.
- Is the patient pregnant? When in doubt, perform a pregnancy test.
- Investigate any abnormal bleeding or discharge.

## 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.

Method	Typical Use (usual mistakes)	Perfect use (no mistakes)
<i>Implant</i>	<1 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
<i>Sterilisation (male or female)</i>	<1 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
<i>IUD</i>	<1 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
<i>Depot</i>	3 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
<i>Pill (COC or POP)</i>	8 in 100 women pregnant in 1 year	<1 in 100 women pregnant in 1 year
<i>Condom</i>	15 in 100 women pregnant in 1 year	2 in 100 women pregnant in 1 year

A method that is NOT very EFFECTIVE is 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).

CONDOM

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 pregnancies.

**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\*\***

## ORAL CONTRACEPTIVE PILL (OCP)

### **Preparation:**

Most tablets contain a combination of oestrogen (30 µg) 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 over 40 years of age, or is over 35 years and is a smoker.
- 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.
- High BP >140/90 or diabetes mellitus.
- Uterus, breast or liver cancer (or active liver disease), gallbladder disease.
- Pregnant or breastfeeding (ask the doctor about progesterone-only pill for these women).
- There has been no menstruation yet.
- Obese, with BMI >35 (see p. 183).
- Taking these drugs: carbamazepine, griseofulvin, 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:
  - Exclude the following possible causes of breakthrough bleeding: cervix disease; retained products of conception; missing pills; drug use e.g. antibiotics; and diarrhoea.
  - If all above causes excluded consider the 50 µg or 60 µg oestrogen combined OCP.

#### **What to tell women taking the pill:**

1. Take one tablet every day at the same time, try to link to an activity to help remember e.g. take pill immediately when wake up.
2. Start taking active tablets on day 1 of menstruation.
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 has 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.

## DEPOT INJECTION

### **Preparation:**

Each injection of Depot contains 150mg of medroxyprogesterone acetate in 3ml.

Depot 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. However, women often forget or are unable to come regularly to a clinic for injections. It is 97% effective with typical use.

**Contraindications – DO NOT GIVE IF:**

- The patient has liver disease.
- The patient has a history of stroke or heart attack.
- Close family history of stroke or heart attack at <45 yrs.
- If >40 years old, diabetes, high BP (>160/100mmHg) or obese. Discuss with the doctor.

**Most common side effects:**

Irregular vaginal bleeding, no bleeding at all (50% of women have no menstruation after 12 months on depot. The periods return when depot is stopped), nausea, weight gain, headaches, dizziness.

**When to start:**

If starting within 7 days of monthly bleed, no need for condoms.

If more than 7 days after start of monthly bleed need to use condoms for first 7 days after injection

Delay until at least 6 weeks after giving birth.

**Important:**

Make it very clear to the woman when the next injection is due (11-12 weeks).

**If >2 weeks late, do urine pregnancy test.**

a) If positive do not give Depot.

b) If negative, give Depot and advise to use condoms for 14 days, and return to the clinic if no menstruation comes.

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 the Depot.

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

## **INTRA-UTERINE DEVICE (IUD)**

**Preparation:**

This is usually a T-shaped copper device that sits inside the uterus and prevents fertilisation. IUDs can stay in for many years, usually about 5 years. Check the package of the IUD for the exact time.

**Effectiveness:**

Very high, at 99.2% (avoid using the old Nova-T.) The contraceptive is quickly reversible. **Ideal contraception for monogamous (one sexual partner) women who have finished their family but do not want sterilisation.** Easy for patients to use correctly – after insertion they don't need to do anything for years except check to be sure it is still there.

**Contraindications - DO NOT PUT IN IF:**

Pregnant or when pelvic infection.

**Most common side effects:**

Insertion related e.g. perforation, unrecognised expulsion (falls out of the uterus, can't feel the threads). May have heavier bleeding or cramping with menstruation.

## **IMPLANTABLE DEVICES**

**Preparation:**

Implants contain a slow-release progestogen in rods (Norplant II = 2 rods, Implanon = 1 rod) placed just below the skin, usually in the medial, upper arm.

Norplant and Implanon can be used for breastfeeding women. It is appropriate to insert postpartum.

Norplant can be inserted following 1<sup>st</sup> trimester miscarriage, immediate insertion is best or up to 7 days.

**Dose:**

Implanon and Norplant II are both effective for 3 years. Take pregnancy test before inserting.

**Effectiveness:**

99% effective. Fertility returns quickly after removal. Easy for patients to use correctly – after insertion they don't need to do anything for years.

**Contraindications - DO NOT PUT IN IF:**

- Liver disease or breast cancer.
- Abnormal vaginal bleeding.
- Current blood clot in legs (Deep Vein Thrombosis (DVT)) or lungs (Pulmonary Embolism (PE)).

**Most common side effects:**

Irregular vaginal bleeding; no bleeding at all, or infrequent spotting and bleeding; nausea; weight gain (**Note:** this is less of a problem than with Depot).

**When to start:**

Start at any time of the month.

If starting within 7 days of monthly bleeding then no need for condoms.

If starting more than 7 days after monthly bleeding then use condoms for 7 days after insertion.

## STERILISATION

**Types of Sterilisation:**

Male sterilisation - also called VASECTOMY.

- Available through referral to hospital or Mae Tao clinic.
- Need to use another form of family planning for 3 months after vasectomy.

Female sterilisation - also called TUBAL LIGATION.

- Can be done 24-48 hours post-partum, or between pregnancies (at least 4 weeks after delivery).
- Minilaparotomy - a small incision is made underneath the umbilicus or above the pubic symphysis and tubes tied and cut. A combination of diazepam and ketamine is used for anaesthesia.

**Effectiveness:**

99.5% effective

**Contraindications DO NOT DO IF:**

There may be medical contraindications for the surgery such as high blood pressure but there are no contraindications to sterilization. If considering, discuss with the doctor.

**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).

## 12.2 GENDER BASED VIOLENCE

(See the Gender Based Violence Protocol from IRC (International Rescue Committee) for more details)

DEFINITION

**Gender Based Violence (GBV)** is violence against a person on the basis of gender or sex. This can happen to male or females.



**Note:** 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.



## 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)
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 in authority that causes harm (by causing person to be e.g. frightened, humiliated, blamed etc.) e.g. verbal abuse, psychological abuse (threatening physical harm, destroying property), isolation away from friends/other family
4. **Social-Economic Violence** = non-physical, denying person income and social opportunities
5. **Harmful 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

<b>Survivor</b>	=	the person who suffered from the gender based violence
<b>Perpetrator</b>	=	the person who commits the act of gender based violence
<b>Incident</b>	=	the act or event that the <b>survivor</b> is seeking help about.
<b>Consent</b>	=	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. <b>Under Thai Criminal law, the age of consent is 15.</b> This means that a sexual act with someone below the age of 15 is illegal as they are not old enough to consent.
<b>Confidentiality</b>	=	keeping anything the person tells you to yourself and only share the necessary information with your supervisor and others providing assistance. Keeping confidentiality means you must <b>never</b> discuss cases with your family or friends. Only if a survivor agrees to sign a <b>consent form</b> are you allowed to share information about the case with other service providers. The health worker needs to explain with whom the information will be shared and what the benefits and risks are of sharing this information. The survivor can always refuse to share the information with others.
<b>Child</b>	=	under Thai law person under the age of 15 years

### Recognising Domestic Violence

Many are reluctant to report domestic violence. Make it clear to the victim that they have the right to live without violence and that there are people who can try to help them.

## 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 patient that this is wrong. The **4 guiding principles** below should be followed by health staff whenever dealing with a case of violence

1. **Security/Safety**
  - A safe place needs to be found so that the person and their children are away from the person causing them harm.
2. **Confidentiality and Consent**
  - Get written permission (consent) from the person 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.
  - Conduct interviews and examinations in a private setting with same sex interpreters whenever possible.
  - Ask only relevant questions and avoid asking to repeat the history as this can be traumatic.
4. **Non-discrimination**
  - Everyone has the right to equal access to services to help them.

## 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.

Management at clinics that do not have training on gender based violence should be on a case by case basis. Discuss with the doctor about the best course of management. **The following is only an outline of the steps to be considered:**

1. Assess the patient for any **immediate medical injuries** that need to be treated e.g. suturing wound.  
**\*\*Note:** it is important to document very clearly any injuries that have been sustained, and what treatment has been given, if possible take a photo of the injuries\*\*
2. If the rape has occurred recently advise the victim **not to wash/shower/change clothes** etc. as forensic evidence (to show in a court of law) may need to be collected by a trained person.
3. **In an acute case AND if the patient gives consent consider immediate referral to Mae Sot Hospital/ Myawaddy hospital** or another organisation that has had training in the management of gender based violence.
4. **Referring to the appropriate organisations** e.g. Social Action for Women to ensure support for further management and safety if the patient gives consent.
5. **Discussing with the correct people** e.g. police, village head, only after consent from the patient.

Below is an outline on how to manage a case of gender based violence. **Each case needs to be treated individually.** For example do not ask lots of detailed questions about what happened if you are going to refer to somewhere where they will ask all the questions again which would be very upsetting for the patient.

### ASSESSMENT:

1. Go to a private room in the clinic where you can talk to the patient – establish a relationship by introducing yourself; explain confidentiality. Tell the patient everything that is going to happen during the interview and the examination. Ask them 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. Write a sentence saying that you have the patient's permission to document what happened and ask them to sign it.
2. Explain that everything they say will be confidential unless:
  - 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.

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### 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 supervisor/ doctor. **If the patient has suicidal thoughts you ARE allowed to break confidentiality** and inform another person, even if it is against the person's wishes. *See suicidality p. 153 for more detail.*

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### MEDICAL TREATMENT AND DOCUMENTATION:

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**\*\*Note: It is incredibly important to document all findings clearly and completely in words and diagrams\*\***

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#### 1. Physical Examination

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
- **Note: A full examination including a genital examination SHOULD ONLY BE DONE BY A PERSON TRAINED IN GENDER BASED VIOLENCE**

#### 2. Give emergency medical treatment

Wounds and fractures: clean and dress appropriately or refer to nearest hospital: tetanus prone wounds will need a tetanus booster (see p.134).

### 3. Specific treatment for rape victims

All rape victims should be treated for STD, PEP for HIV and Hepatitis B and pregnancy immediately:

#### a) STD prevention:

**Ceftriaxone** 250mg IM STAT **AND**

**Metronidazole** 2g STAT **AND**

**Azithromycin** 1g STAT **OR doxycycline** 100mg BID 7 days (see p.194)

b) **HIV prevention: start as soon as possible after the incident**, preferably 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 chapter (PEP)* (p.7). Every clinic needs one or two PEP packs ready to give to rape victims (**Note:** check the use by date).

c) **Hepatitis B:** If the patient has not already been vaccinated, give immunisation with **hepatitis B vaccine** (HBV) as soon as possible (if available). Advise to finish the course. 1<sup>st</sup> dose: day 0 (as soon as possible), 2<sup>nd</sup> dose: 1 month, 3<sup>rd</sup> dose: 6 months.

d) **Pregnancy prevention:** Take a pregnancy test before giving emergency contraception (EC).

If pregnancy test positive: do not give her the pills. Explain to her that this means she was pregnant **before** the rape occurred.

If pregnancy test negative: treatment depends on the amount of time since the rape

- **Within 120 hours (5 days) after the incident**

- 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 containing levonorgestrel: First dose = 4 tablets **AND** Second dose (12 hours after the first dose) = 4 tablets.
- Give metoclopramide 10mg PO 1 hour before EC pills to prevent nausea and vomiting. (Give for both doses).

- **After 120 hours (5 days) but within 7 days of the incident:** too late for EC; explain that an IUD can help.

- **After 7 days of the incident:** it is too late to prevent pregnancy. Check pregnancy test and follow-up.

### 4. After prescribing all the necessary treatments ask the patient about SAFETY.

Will the patient be safe when they leave the clinic? Will someone try to hurt them when they leave the clinic?

If the answer is yes then explain possible options for safety assistance, such as GBV staff, women's organisations, camp security, etc.

#### REFERRAL:

**\*\*Note:** Referrals depend on the survivor's needs and must be discussed with the survivor.\*\*

Immediate Needs	
1. Health	Refer to the local hospital if necessary.
2. Safety	Refer patient to GBV staff, camp security or women's groups e.g. Social Action for Women, Foundation for Women, Tak Shelter.
Long term management	
1. Psychosocial Support	Refer patient for psychosocial support to GBV staff, COERR or women's groups e.g. OSCC Mae Sot Hospital, Social Action for Women, Mae Tao Clinic, Foundation for Women
2. Legal Justice	Refer patient to the camp justice, Thai authorities, UNHCR Lawyers' Council of Thailand Mae Sot, Organisations that can help include: Migrant Assistance Program, Legal Assistance for Workers Program, Labour Law Clinic

#### FOLLOW UP:

If the patient is not being cared for by another organisation specifically trained to help victims of GBV, schedule a follow-up visit for 2 weeks, 1 month, and 3 months. Record the next follow-up visit.

These are minimum follow up appointments for survivors. A patient may choose to meet again sooner or more frequently. Emotional support, safety, psychosocial support, referral and support services should be offered at all follow-up visits.

**Pregnancy testing** for rape victims should be checked at 1 month and **HIV testing** at 3 months. If no STI prevention drugs were taken, a syphilis serology and STD check may be necessary.



## CHAPTER 13: GASTRO INTESTINAL DISEASES

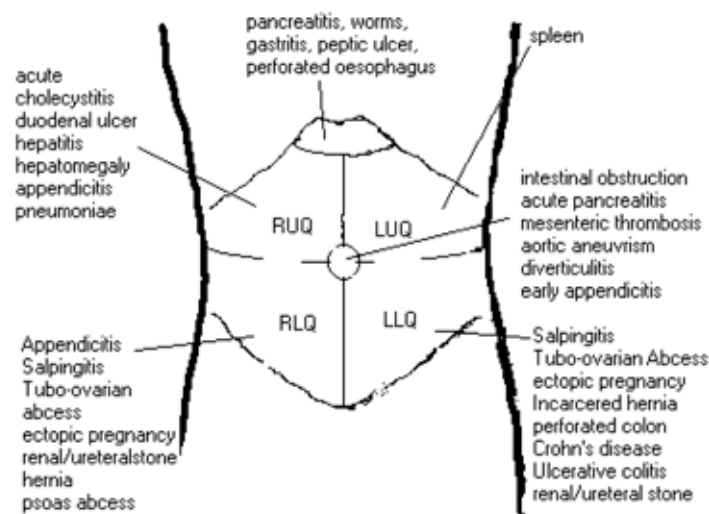
### 13.1 ACUTE ABDOMINAL PAIN

#### DEFINITION

**Any serious acute abdominal problem for which surgery must be considered.** The patient may have severe pain, tenderness, muscular rigidity and/or abdominal distension. Signs of shock may be present. Good history taking and examination are essential to diagnose the correct disease.

Some diseases require immediate surgery e.g. organ rupture (e.g. ectopic pregnancy, aneurysm of aorta, rupture of spleen) or peritonitis (e.g. perforation of stomach, intestine or gall bladder).

#### COMMON CAUSES



Check the patient carefully before providing any treatment. However, in some cases (patients with severe pain) painkillers may be needed before examination. Examine young children when they are calm and quiet.

**Abdominal pain can be caused by surgical and non-surgical problems.**

Use the following as a guide:

#### 1. Hard abdomen with moderate to severe pain = EMERGENCY

It usually represents SURGICAL CAUSES e.g. peritonitis, appendicitis, cholecystitis, intestinal perforation/obstruction (may have distended abdomen with tinkling bowel sounds), ectopic pregnancy rupture. Renal stones, incarcerated hernia and cholangitis might also need an operation.

#### TREATMENT

##### DR-ABCDE

Give nothing to eat or drink.

IV ampicillin + IV gentamicin + IV metronidazole

IV fluids - NSS

**REFER THE PATIENT TO HOSPITAL IMMEDIATELY.**

#### 2. Soft abdomen with moderate pain

It usually represents NON-SURGICAL CAUSES e.g. pyelonephritis, worms, painful menstruation, pelvic inflammatory disease (PID), peptic ulcer (without perforation), gynaecological or obstetric problems, hepatitis.

#### TREATMENT

According to cause.

## 13.2 GASTRO-INTESTINAL BLEEDING

### DEFINITION

Bleeding from the GI tract. Symptoms depend on where in the GI tract the blood is coming from. Sometimes the bleeding can be chronic e.g. from a cancer or can be acute e.g. variceal bleed.

**If bleeding is acute this is an emergency: patients can become very unwell very quickly.**

### CAUSES

#### Upper GI tract (UGI) e.g. stomach, oesophagus:

1. Peptic ulcer disease
2. Varices (from portal hypertension from liver disease e.g. alcoholism)
3. Cancer

#### Lower GI tract e.g. intestine

1. Diverticulitis (pouches in wall of intestine)
2. Cancer
3. Inflammatory bowel disease
4. Dysentery

### SIGNS/SYMPTOMS

- **Bleeding from the upper GI tract e.g. stomach, oesophagus:**
  - 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).
- **Bleeding from the lower GI tract e.g. intestine:**
  - Fresh blood from rectum .
- May have signs of shock – tachycardia, low BP, high CRT, fast RR, cold peripheries.

### EMERGENCY TREATMENT In case of active bleeding:

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>GI BLEEDING</b>	
<b>DR</b>	Danger Response	Gloves Safe place, call for help	
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	<b>Suction</b> (if available) Oxygen	
<b>B</b>	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest		
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	<b>2 IV cannulas</b> (biggest size possible 16G or 18G) Take bloods e.g. <b>Hct, blood group, BUN*</b> , CBC, MS, dextrose etc. <b>Fluid bolus 1L STAT</b> <b>Transfuse</b> if signs of shock	
<b>D</b>	Check dextrose Seizures Pain	If UGI bleeding and suspect <b>PEPTIC ULCER DISEASE</b> e.g. history of abdominal pain, no risk factors for liver disease: <b>Omeprazole</b> 40mg IV (or PO) <u>OR</u> <b>Ranitidine</b> 50mg IV	If suspect <b>PORTAL HYPERTENSION</b> e.g. high alcohol intake, chronic hep B or C or signs of cirrhosis) discuss with the doctor and consider: <b>Ceftriaxone</b> IV 1g OD for 5-7 days (varices are often associated with bacterial infection) +/- <b>Vitamin K</b> IM 2.5-10mg STAT dose
<b>E</b>	AVPU/GCS Expose and examine	History, further investigations, treatment plan	
<b>DISCUSS WITH DOCTOR</b>			
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>			

\*If unclear if patient is having melaena or not, it may be useful to check the BUN – if this is raised it may be a sign of an upper GI bleed

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**\*\*THIS PATIENT NEEDS REFERRAL TO HOSPITAL: IT IS VERY IMPORTANT TO MAKE THE PATIENT AS STABLE AS POSSIBLE (USING ABCDE) BEFORE YOU TRANSPORT THEM TO HOSPITAL\*\***

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#### SECONDARY TREATMENT

- No food or drink
  - **REFER TO HOSPITAL URGENTLY**
- 

**\*\*Note:** bleeding from some causes e.g. peptic ulcer disease may occur slowly and be more chronic. For treatment see peptic ulcer disease p.80.\*\*

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### 13.3 EPIGASTRIC PAIN

Epigastric pain is a very common complaint in clinics on the Thai-Myanmar border. Possible causes are:

#### GASTRO-OESOPHAGEAL REFLUX DISEASE

##### DEFINITION

Gastro-oesophageal reflux disease (GORD) is caused by a weak sphincter (muscle) between the oesophagus and the stomach which means that the contents from the stomach reflux into the oesophagus causing a burning pain.

##### RISK FACTORS

- |                         |   |
|-------------------------|---|
| 1. High alcohol intake  | 5. Heavy smoking  |
| 2. Obesity              | 6. Pregnancy  |
| 3. Eating spicy food    | 7. Drugs e.g. NSAIDs, steroids, aspirin and doxycycline |
| 4. High caffeine intake |   |

##### SIGNS AND SYMPTOMS

Burning pain in the epigastric area moving to the mouth with acid taste, especially when lie down.

##### DIAGNOSIS

Clinical diagnosis.

##### TREATMENT

###### **Lifestyle advice:**

- Try to reduce or stop: alcohol, smoking, spicy food, hot drinks, tea and coffee.
- Avoid eating for 3 hours before bedtime, eat more but smaller meals, 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 algorithm p.82
- De-worm

##### PREVENTION

Lifestyle advice (same as for treatment)

#### GASTRITIS

##### DEFINITION

Gastritis is an inflammation of the stomach surface.

##### CAUSES

1. High alcohol intake
2. Heavy smoking
3. Eating spicy food.
4. *H. pylori* bacteria in the stomach (see below)
5. Prolonged use of some medicines (like aspirin, indomethacin, ibuprofen, high dose ferrous sulphate) can cause or worsen the disease.

SIGNS AND SYMPTOMS

- Burning pain in the epigastric area.
- Nausea, vomiting, bulging, feeling of fullness.

DIAGNOSIS

Clinical diagnosis.

If vomiting with blood: see p.23 gastrointestinal emergencies.

TREATMENT**Lifestyle advice:**

- Try to reduce or stop: 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 algorithm p. 82
- De-worm

PREVENTION

Avoid coffee, alcohol, eating spicy foods, smoking. Avoid prolonged use of medications that cause gastritis e.g. ibuprofen. If long term medication absolutely necessary e.g. steroids for nephrotic syndrome consider **omeprazole** 20mg OD prophylaxis to prevent gastritis.

**PEPTIC ULCER DISEASE**DEFINITION

In peptic ulcer disease, epigastric pain can be very severe. Ulcers are often found in the stomach (gastric ulcer) or in the duodenum (duodenal ulcer). Often peptic ulcers are caused by infection with bacteria called *H. pylori* (see below). Medicines that reduce 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 reduce with eating, but comes back 1-2 hours after a meal.
- Nausea, vomiting, loss of appetite.
- Weakness and fatigue due to chronic bleeding.

COMPLICATIONS

- **Acute bleeding:** In some cases acute bleeding can happen. The patient will vomit brown liquid (like coffee) or fresh blood and may have melaena (black sticky smelly stools). *See above for emergency treatment.*
- **Chronic bleeding:** if small amount of bleeding occurs over a long time, then the patient will become anaemic.
- **Perforation:** hole in the stomach wall which can lead to peritonitis (hard, very tender abdomen), sepsis and death.
  - **DR-ABCDE**
  - Give nothing to eat or drink.
  - IV **ampicillin** + IV **gentamicin** + IV **metronidazole**
  - IV fluids – NSS
  - **REFER THE PATIENT TO HOSPITAL IMMEDIATELY**

DIAGNOSIS

It is a clinical diagnosis. Examine abdomen to check for any pain/masses. Look for anaemia. Ideally all patients who suffer from peptic ulcer disease should be tested for *H. pylori*. However, testing is expensive and not done at the border clinics (see Box 1).

TREATMENT

For treatment see algorithm p. 82

---

**Note:** When giving treatment it is important to do ALL the steps, not just give medication:

1. Lifestyle advice
  2. Stop any exacerbating medications
  3. De-worm
  4. Trial medications
  5. *H. pylori* eradication if medical treatment fails (see below)
-



**PREVENTION**

Avoid coffee, alcohol, eating spicy foods, smoking. Avoid prolonged use of medications that may cause peptic ulcer disease e.g. ibuprofen. If long term medication absolutely necessary e.g. steroids for nephrotic syndrome consider **omeprazole** 20mg OD prophylaxis.

**Box 1: Helicobacter pylori (H. pylori):**

*H. pylori* is a bacteria that is found in many people's stomachs. This bacteria is resistant to acid and able to survive the highly acidic environment in the stomach. Often people do not know they have the infection, and it does not cause any problems. In some people it can cause 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 a breathing or a stool test which are expensive and not available at most clinics on the border.

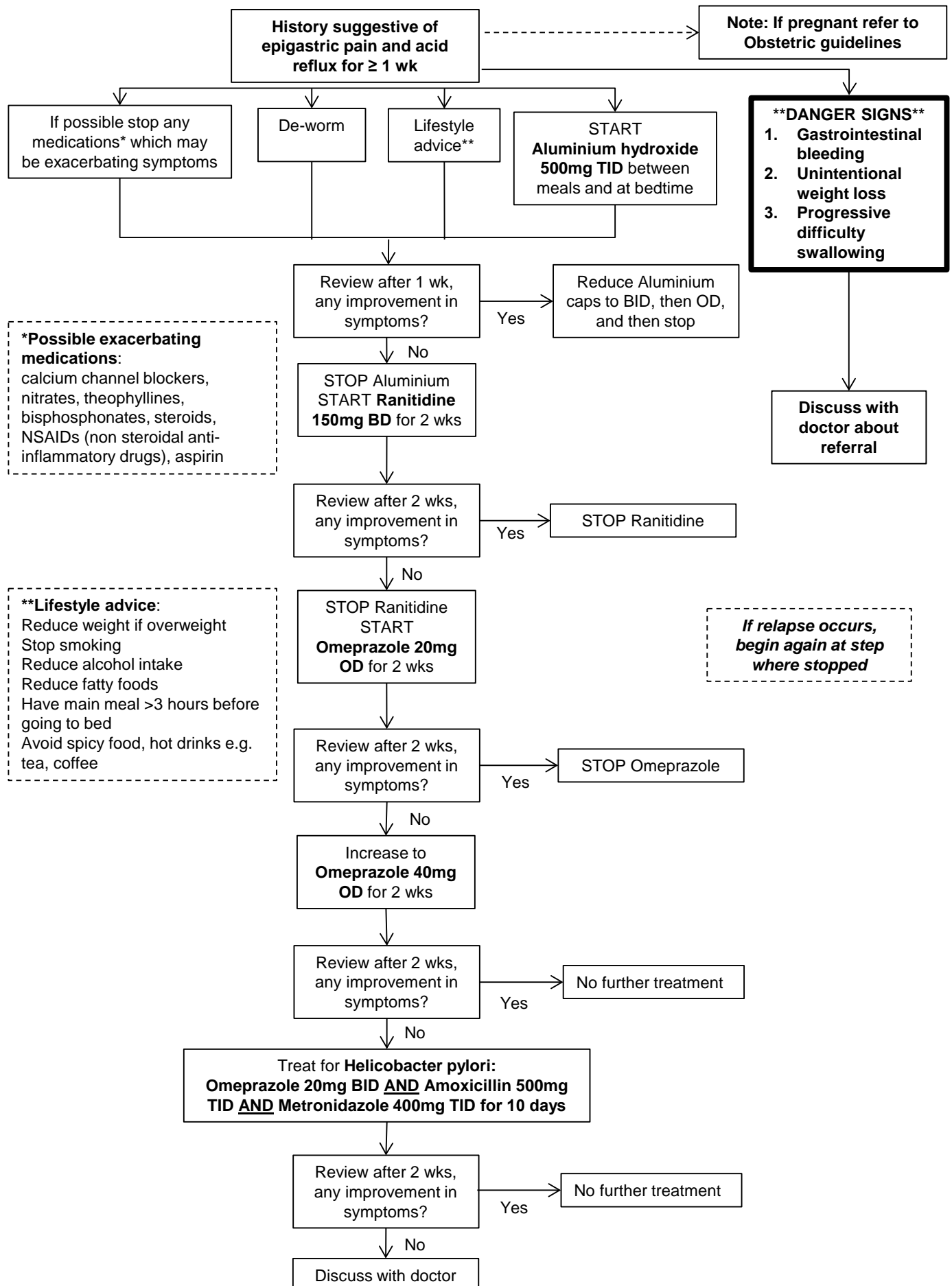
Since the source of *H. pylori* is not yet known, recommendations for avoiding infection have not been made. In general, it is always wise for persons to wash hands thoroughly, to eat food that has been properly prepared, and to drink water from a safe, clean source.

If symptoms do not improve with medical management it is possible to try to eradicate *H. pylori*.

**Omeprazole** 20mg BID for 10 days AND  
**Metronidazole** 500mg TID for 10 days AND  
**Amoxicillin** 500mg TID for 10 days

Follow triple therapy with **Omeprazole** 20mg OD for 2 weeks

**\*\*Note:** Different resistance patterns of *H. pylori* are found throughout the world, so even if these medications are given there is no guarantee that the bacteria will be cleared.\*\*



## WORMS

Worms often give epigastric and abdominal pain in children and adults. (see worms p.97)

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Treat all epigastric pain with a course of **mebendazole** or **albendazole**.  
(Not in children < 1 year or pregnant women in first trimester)

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## ANXIETY

An anxious person can complain of epigastric pain. Try to take a good history and look especially at the social history (see p.148). **You need to rule out other causes of abdominal pain before considering anxiety as the diagnosis.**

## STOMACH CANCER

In a patient with **epigastric pain** and **weight loss**, consider the possibility of cancer, especially if more than 60 years old. Symptoms of weight loss, loss of appetite, weakness and fatigue make the diagnosis more likely. A large lymph node above the left clavicle is a sign of cancer of the stomach. Curative treatment will be not available in most clinics but provide palliative care (p.192).

## 13.4 DIARRHOEA

### DEFINITION

Diarrhoea is a symptom and not a disease.

**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, or other diseases).

**Chronic diarrhoea** = A diarrhoeal episode that lasts more than 2 weeks (**Note:** causes and treatments for chronic diarrhoea are different than for acute diarrhoea).

The following 2 types of acute diarrhoea are described: (mixed syndromes can occur)

#### 1. **DIARRHOEA WITHOUT BLOOD**

Stools are very liquid (watery diarrhoea), many stools, and clear colour (brown, yellowish). Fever and abdominal pain can exist but there is no blood or mucus in stools. The clinical signs are mostly caused by dehydration. The cause can be viral, bacterial (e.g. Cholera, *E. Coli*) or parasitic (e.g. *Giardia*). **Note:** acute diarrhoea without blood can also be seen in malaria.

#### 2. **DYSENTERIC DIARRHOEA - DIARRHOEA WITH BLOOD**

Stools are soft rather than liquid and are with blood. There is abdominal pain and fever can be high. Most common causes are *Shigella* and *Campylobacter*. Parasites like amoeba 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, feeling that haven't completely emptied bowels (tenesmus), fever or vomiting?

**Table 1: Acute diarrhoea**

	DIARRHOEA WITHOUT BLOOD	DYSENTERIC DIARRHOEA
Signs	Sometimes fever Slight abdominal pain Vomiting	High fever Moderate to severe abdominal pain Vomiting
Stools	Watery	Blood
Life-threatening	Dehydration	Sepsis

## DIAGNOSIS

It is most important to evaluate and treat dehydration. Diagnosis is made on clinical grounds: diarrhoea without blood or dysentery. To specify between viral, bacterial or amoebic disease you need to carry out 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 associated diseases such as malaria (see malaria guidelines), otitis media (see p. 46), pneumonia (see p.203), meningitis (see p.130) or UTI (see p.99).
- Look for signs of purging watery diarrhoea or repeated vomiting. Think of **Cholera** (p.88).
- If the patient has **abdominal signs**: a tender abdomen or abdominal distension, think of surgical causes (obstruction or perforation).
- With **chronic diarrhoea** (>2 weeks) think of malnutrition (see p.175) and chronic diseases e.g. HIV (see p.119).

## TREATMENT OF DIARRHOEA:

Follow these steps to safely diagnose and treat diarrhoea:

1. **Assess acute or chronic**
2. **Evaluate hydration 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 cause of diarrhoea and if any antibiotics are needed.**

Below is 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. First assess your patient for signs of dehydration: see *table 2*.

**Table 2: Clinical signs for evaluating dehydration plan (WHO)**

	<b>Plan A: No Dehydration</b>	<b>Plan B: Mild Dehydration <u>2 or more of:</u></b>	<b>Plan C: Severe Dehydration <u>2 or more of:</u></b>
<b>General conditions</b>	Normal	Agitated	Very tired or unconscious
<b>Eyes</b>	Normal	Slightly sunken	Deeply sunken
<b>Tears</b>	Present	Absent	Absent
<b>Mouth and Tongue</b>	Moist	Dry	Very dry
<b>Thirsty</b>	None	Yes	Not able to drink (too weak to express the need)
<b>Skin pinch</b>	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:

**WHO PLAN A:****To treat diarrhoea at home and prevent dehydration  
(SEE APPENDIX FOR ORS/RICE WATER)**

The patient has **no signs of dehydration**. Do not 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 2L.

**What fluid to give?**

- **Oral Rehydration Solution (ORS)** (can also give salted rice water, salted yoghurt drink or vegetable/chicken soup with salt).
- Do not give fluids e.g. carbonated (fizzy) drinks, commercial fruit juices, sweetened tea, tea or coffee.

**How to give?**

- Tell the mother to give frequent small sips from a cup.
- If the child vomits, 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 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 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 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:**

- |                             |   |                                   |
|-----------------------------|---|-----------------------------------|
| • Passes many watery stools | • Vomits a lot                                | • Has a fever                     |
| • Is very thirsty           | • Seems not to be getting better after 3 days | • Does not eat or drink normally. |
| • Blood in stool            |   |                                   |

**WHO PLAN B**  
**To treat dehydration**  
**(SEE APPENDIX FOR ORS/RICE WATER)**

The patient has **signs of dehydration**. 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 – do not go straight to IV fluids because of vomiting:**

**Table 3: WHO Guidelines approximate amount of ORS to give in first 4 hours**

**\*\* Use age only if cannot get weight\*\***

Weight	Less than 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 worse dehydration **every 1 hour**. If at any point 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 fully according to table 2 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 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 days**.

**FEEDING**

Should not be given in the first four hours (except for breastfeeding).

After 4 hours if continuing on plan B or plan A 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.

**WHO PLAN C****\*\*EMERGENCY\*\* to treat severe dehydration:****DR-ABCDE emergency approach.** Needs admission to IPD**REHYDRATE**Give IV hydration with **Ringers Lactate**:**Table 4: 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:	When to re-assess
<b>Infants under 12 months</b>	Give ORS	1 hour	5 hours	6 hours
<b>Older than 12 months</b>	Give ORS	30 minutes	2 ½ hours	3 hours
<b>Remember:</b> $\text{drops/min} = \frac{\text{ml}}{\text{hr}} \times \frac{\text{drop in 1 ml}}{60}$ <b>Example:</b> I want to give 500ml in 5 hours. There are 20 drops in 1ml. Then drops/min = $500/5 \times 20/60 = 33 \text{ drops/min}$				

**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 Table 2:

- 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 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 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 &gt;6m should have some food before they are discharged.

**6. Consider cause of diarrhoea and if any antibiotics are needed.****DIARRHOEA WITHOUT BLOOD****Patients with watery diarrhoea do NOT need antibiotics.****They only need REHYDRATION**

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 (see Cholera p.88). 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. Antibiotics should be given to severe cholera cases, as they have been shown to reduce the volume and the duration of the diarrhoea.

**Giardia:** This diarrhoea is caused by a parasite (*giardia intestinalis*). In most of the cases, there are only few clinical signs: nausea, abdominal pain, weight loss, (watery) diarrhoea. There is no fever. If the diarrhoea becomes chronic (more than 14 days): treat with **metronidazole for 3 days: Adults: 2 g OD; Child: 10mg/kg TID.**

## DYSENTERY – DIARRHOEA WITH BLOOD

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Where possible, a stool sample should be seen by a medic.

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There are two types of dysentery:

**Bacterial:** Several types of bacteria cause dysentery, the most severe form is *Shigella*.  
Associated symptoms: fever, abdominal pain, feeling that haven't completely emptied bowels (tenesmus), unwell patient.

**Amoebic:** Often not acute illness, less than 30% of sufferers have fever. Sometimes the amoebae migrate via the blood to form peripheral (e.g. liver) abscesses (see p.96).

It is often not possible to differentiate between amoebic and bacterial diarrhoea without laboratory stool investigation. Choose the therapy according to patient's symptoms (especially presence of fever and if patient is at risk):

### ADULT PATIENTS AT RISK

1. Patient over 65 years old with no support at home to help them.
2. Malnourished.
3. High fever >39°C.
4. Signs of severe dehydration.
5. Signs of confusion, seizures or coma.

#### 1. NO FEVER

Admit to IPD if the patient is **at risk**. If possible treat in diarrhoea ward/area to prevent spreading.

Prescribe **metronidazole PO x 5 days** (5-10 days if liver amoebiasis (see *liver abscess* p.96)):

Adult:	750mg TID
Child:	15mg/kg TID

**\*\*Note:** Metronidazole doses for amoeba are higher than usual. Follow the recommended dose given here.\*\*

#### 2. FEVER

Admit to IPD if patient is **at risk**. If possible treat in diarrhoea ward/area to prevent spreading.

Treat the fever with paracetamol.

Give **ciprofloxacin PO x 3 days:**

Adults:	500mg BID
Child >1m	15mg/kg BID

**Note:** if pregnant (ciprofloxacin contraindicated) give **ceftriaxone IM 1g OD for 3-5 days**.

If not better give **metronidazole** (dose as above).

Ensure sufficient food intake of normal diet.

**\*\*Watch for complications: abdominal distension, perforation, sepsis\*\***

**Note:** 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 infection, sometimes it is difficult to find with a microscope. When there are an increased number of cases of diarrhoea, take stool samples for laboratory analysis (culture and sensitivity), 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.
- Cook food well and keep it covered.
- Use toilets. Clean carefully after passing stools.
- Do not use chronic antacid (like aluminium); gastric acidity helps to fight bacteria.

### COMPLICATION

Septicaemia, acute abdomen, amoebic liver abscess and haemolytic uremic syndrome (HUS) (anaemia, low platelets and acute renal failure).

### VACCINE

For cholera, only a short-acting vaccine (useful in outbreaks) is available.



## 13.5 CHOLERA

URGENT REPORT  
SEE APPENDIX

Cholera is very infectious – if suspect a case then use safety precautions and discuss with the doctor about referral to hospital

### 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.

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.

### SIGNS AND SYMPTOMS

- Infections range from asymptomatic to acute fulminant watery diarrhoea, often 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* may be 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

Clinical

In outbreaks, in non-epidemic situations stool-sample test for *V. cholera* can be done, although if suspect a case a referral should be done.

### TREATMENT

**Note:** if suspect cholera – put in IV line, give Ringers Lactate 1L stat and refer to hospital immediately

If unable to refer (only if rural clinic) then follow these steps:

- Rapid replacement of lost fluid and electrolytes through immediate oral or IV rehydration. A patient needs 10-15 litres of fluid the first day. In severely dehydrated patients 50-100ml/kg/hr.
- Rehydrate with Ringers Lactate with careful replacement of potassium after 24h of fluid replacement. Check potassium if possible. If hypokalaemia, add potassium chloride (20-40mmol KCl) in one litre Ringers Lactate. See electrolyte abnormality pg.49.
- Antimicrobial therapy is indicated for severely dehydrated patients 2 years or older.
- Several antibiotics are recommended by WHO (doxycycline, tetracycline, trimethoprim-sulfamethoxazole, erythromycin, chloramphenicol or ciprofloxacin) but different resistance levels are found in different parts of the world. Previous recommendation for the Thai-Myanmar border is **ciprofloxacin** 1 gram STAT dose. It is recommended to check for resistance in your clinic before starting treatment.

**\*\*Note:** if unable to 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.5)

### PREVENTION

Use clean water for hand-washing and for cooking.

Avoid uncooked seafood.

Avoid eating leftovers of rice as this is an excellent growth medium.

### VACCINE

There are vaccines for short-term protection (6 months). These vaccines should be given in case of an outbreak situation.

## 13.6 LIVER DISEASES

### LIVER FUNCTION TESTS (LFTs)

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:

LIVER ENZYMES	FUNCTION	CAUSES
<b>AST/ALT</b>	Enzymes produced by the liver when the liver is damaged.	<b>High if:</b> Problem with liver cells e.g. hepatitis, cirrhosis
<b>ALP</b>	Found in high amounts in the liver, bone and placenta.	<b>High if:</b> Problem with bile duct blockage e.g. gallstones Bone disease e.g. fracture, tumour Pregnancy Children (as bones growing)
<b>GGT</b>	Produced with diseases of liver, pancreas and biliary tract i.e. gallbladder.	<b>High if:</b> Alcohol excess If GGT high and ALP also high helps to say it is liver problem rather than bone problem
<b>Albumin</b>	Major blood protein in the body that is made in the liver.	<b>Low if:</b> Malnutrition Chronic liver disease Nephrotic syndrome Burns
<b>Bilirubin</b>	Waste chemical that the body produces when the RBC die. To get rid of the bilirubin from the body the liver 'conjugates' the bilirubin (changes it to a form that the body can get rid of in the bile).	<b>High if:</b>
<b>Unconjugated (indirect) bilirubin</b>	Bilirubin that has not been changed by the liver.	Haemolysis e.g. G6PD, drug reaction
<b>Conjugated (direct) bilirubin</b>	Bilirubin that has been changed by the liver.	Liver problems e.g. hepatitis

## 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, most drug reactions: will improve by itself/ stopping drug.

**Acute or chronic** e.g. hepatitis B: may be acute if the body's immune system manages to fight the virus, 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:

	Transmission	Length of infection	Treatment	Complication
<b>Hepatitis A</b>	Faeco-oral e.g. poor hygiene	Acute	Supportive	Severe illness if pregnant
<b>Hepatitis B</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)	Liver cirrhosis Liver cancer
<b>Hepatitis C</b>	Contact with infected blood, congenital	Often chronic	Antiviral drugs (may not be available)	Liver cirrhosis Liver cancer

2. **Drugs:** e.g. anti-TB drugs, HIV drugs, leprosy drugs
3. **Alcoholic hepatitis**
4. **Autoimmune hepatitis**

#### SIGNS AND SYMPTOMS

- Jaundice
- Malaise
- Mild fever
- Loss of appetite
- Nausea and vomiting
- Right upper quadrant pain
- Smooth, tender and slightly enlarged liver
- Dark urine, stools not pale.

**Note:** In some people viral hepatitis infection can cause some symptoms. In other people it may cause fulminant (severe life threatening) liver disease.

#### DIAGNOSIS

Liver function test (AST/ALT raised)

Hepatitis B testing (see below)

Liver ultrasound

#### **Interpretation of Hepatitis B results:**

For definitions e.g. antibody/antigen see p.129).

**Note:** In our setting it is not usually needed to check all of these tests (often only HBsAg +/- HBeAg are tested for):

#### **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 i.e. can pass the infection on to someone else.

#### **Anti-HBs (Hepatitis B surface antibody)**

- Antibody that is formed when the immune system fights the hepatitis B virus.
- It means that the person has developed immunity 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 and that the patient is infectious.

#### **Anti-HBc (Hepatitis B core antibody)**

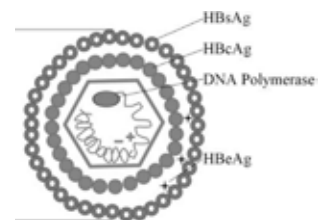
- The body makes this antibody when the symptoms begin in acute hepatitis B and continues for life.
- Means that the patient has an acute ongoing infection or had a previous infection.

#### **IgM anti-HBc (IgM antibody)**

- Antibodies against hepatitis B core antigen.
- If high means recent or acute infection.

#### **HBeAg (Hepatitis B e antigen)**

- Similar to hepatitis core antigen.
- Means that the patient is **very infectious**.



HBsAg	Anti-HBc	Anti-HBs	IgM anti-HBc	Interpretation
-	-	-		No acute or chronic infection. Not immunised and could become infected if exposed
-	+	+		No acute or chronic infection. Patient has had a previous infection that the body fought against. Patient is now immune.
-	-	+		No acute or chronic infection. Patient is immune because of the hepatitis B vaccination
+	+	-	+	Acute infection
+	+	-	-	Chronic infection
-	+	-		Unclear – could be: 1. Resolved infection (most common) 2. False positive anti-HBc 3. Low level chronic infection 4. Resolving acute infection

**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 should be taken.

If the patient is taking drugs that could affect the liver, stop the drugs and refer to the doctor.

When giving medications be careful to check if safe in liver disease or if a different dose needs to be given.

Unfortunately 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.7), 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 up to date vaccine schedule).

**LIVER CIRRHOSIS****DEFINITION**

Cirrhosis is a chronic disease that destroys the cells of the liver and replaces them with scar tissue.

**CAUSES**

Common causes:

1. **Chronic alcohol abuse**
2. **Chronic hepatitis B (or C) virus** is a common cause

Less common causes

1. Auto-immune e.g. primary biliary cirrhosis
2. Genetic e.g. Recurrent haemolysis due to blood disorders, biliary atresia (structural abnormality of liver/bile ducts from birth)
3. Drugs e.g. isoniazid, steroids, paracetamol overdose

**SIGNS AND SYMPTOMS**

- Jaundice
- Malaise, weakness, bodily itching
- Red palm side of hands (palmar erythema)
- Slow hand tremor
- Ascites, oedema of the legs and back
- Muscle wasting
- Spider naevi (red spider-like blood vessels on the skin).
- Hair loss, loss of libido (sex drive)
- Peripheral neuropathy
- Hepatic encephalopathy
- Men: Gynaecomastia, testicular atrophy, impotence
- Women: breast atrophy, irregular menstruation, amenorrhea
- Haemorrhage: bruises, purpura, epistaxis
- Portal hypertension: splenomegaly, caput medusa (distended abdominal veins), variceal bleeding
- Clubbing, pigmentation, Dupuytren's contracture (thickening of tendon of little/ring finger in hand), white nails

**COMPLICATIONS**

- Hypoglycaemia
- Liver failure +/- encephalopathy
- Portal hypertension +/- oesophageal varices +/- GI bleeding
- Ascites
- Infections (bacterial peritonitis)
- Poor nutrition +/- vitamin deficiencies
- Hepatocellular carcinoma (liver cancer)
- Heart and kidney failure

**DIAGNOSIS**

Liver function test (AST/ALT raised). Alpha feto-protein 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, as HBP is a risk for bleeding.
- 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. NSAIDs.
- Adjust dose of medications e.g. paracetamol 500mg TID.
- If alcohol is the cause give prophylactic thiamine (vitamin B1) to prevent Wernicke's encephalopathy see p.155/188.

**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 from the spleen and GI tract to the liver). This pressure causes the veins in the oesophagus, stomach and rectum to dilate (called varices) and possibly rupture. This will cause bleeding in vomit (fresh haematemesis) or in the stool (melaena or fresh blood).

SIGNS AND SYMPTOMS

- Splenomegaly
- Caput medusa (distended abdominal veins)
- Variceal bleeding

TREATMENT


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**In case of an acute upper gastrointestinal haemorrhage:** see p. 23 for DR ABCDE management

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- 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

Abdominal distension due to the build-up of fluid.

DIAGNOSIS

- Clinical – look for other signs of liver failure.
- Think about other causes of oedema e.g. heart failure, kidney failure, low albumin (consider blood tests e.g. albumin, BUN & Creatinine).
- Abdominal ultrasound – especially to look at liver, kidneys and amount of fluid.

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:** Long term high doses of diuretics should have sodium, potassium, BUN and creatinine monitoring\*\*
- Record weight daily.
- If tense ascites which is not improving with medication consider paracentesis (removing up to 2L of fluid).

**3. Spontaneous Bacterial Peritonitis (SBP)**DEFINITION

Patients with ascites are at risk of getting infections of the ascitic fluid. Common organisms are *Klebsiella*, *E coli* and *pneumococcus*.

SYMPTOMS

- |                                       |                                    |
|---------------------------------------|------------------------------------|
| • Abdominal pain                      | • Decreased bowel sounds           |
| • Fever (although may not have fever) | • Sometimes confusion, drowsiness. |

**DIAGNOSIS**

CBC, blood culture, LFT, creatinine & BUN

If unsure of diagnosis can send sample of peritoneal fluid for culture and cell count (Likely SBP if neutrophils  $>250\text{cell/mm}^3$ ). **\*\*Note: DO NOT WAIT FOR RESULTS BEFORE GIVING ANTIBIOTICS\*\***

**TREATMENT**

- Start **ceftriaxone** IV 1g OD and **metronidazole** PO 500mg TID.

**4. Hepatic Encephalopathy****DEFINITION**

Liver cirrhosis causes a build-up of toxins (often containing ammonia) in the blood that a normal liver can normally get rid of. The toxins cause changes to brain function. Attacks are often caused by an infection or constipation.

**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).
- Stop diuretics/correct electrolyte abnormalities (see p.49).
- Treat any infection/dehydration/GI bleeding.
- Remove any sedatives (medications, drugs or alcohol).

**5. Hepatocellular carcinoma****DEFINITION**

Cancer of the liver

**RISK FACTORS**

1. Alcohol excess
2. Hepatitis B and C
3. Aflatoxin (toxin produced by fungus)
4. Liver cirrhosis
5. Haemochromatosis (disease with high iron levels)
6. Wilson's disease (disease with high copper levels)

**DIAGNOSIS**

Ultrasound scan +/- alpha feto-protein

**TREATMENT**

- No treatment is available at clinics on the border, consider referral to hospital. See palliative chapter (pg.193).

**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 will occur. The blockage may be caused by gallstones or worms (especially ascaris). During pregnancy, gallstones are more common.

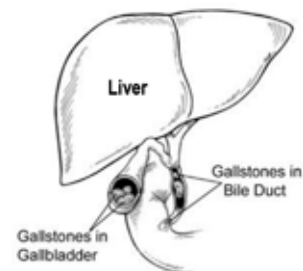
**\*\*Note:** If there is also evidence of infection e.g. fever, high WBC then treat as acute cholecystitis – (see below)\*\*

**RISK FACTORS:**

Four Fs – Female, Fertile, Fat, Forty

**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

## Clinical

Ultrasound of gallbladder to reveal stones (if available).

TREATMENT

- **Buscopan** IM or IV 20mg QDS (max 100mg/d)
- Strong Analgesia e.g. **tramadol** PO 50-100mg, not more often than 4 hours (max 400mg/d)
- If the pain persists after two injections of buscopan and tramadol: consult a doctor.
- Worm treatment (see p.97)

PREVENTION

Regular deworming (e.g. of pregnant women)

Intake of a healthy, low fat diet.

Weight loss

**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 right upper quadrant (RUQ)
- Vomiting
- Fever, rigors
- Jaundice (if bile duct obstruction)

DIAGNOSIS

Clinical; specific sign is pain when the patient breathes in deeply when the RUQ is palpated, and no pain if this procedure is performed on the LUQ (Murphy's Sign).

Ultrasound of the gallbladder to reveal stones, if available.

COMPLICATIONS

Empyema (gallbladder fills with pus), Peritonitis.

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 4 hours (max 400mg/d)
- **Ceftriaxone** IV 1g OD and **metronidazole** PO 500mg TID
- When fever settles switch to oral **ciprofloxacin** 500mg BID and **metronidazole** 500mg TID (total 10 days of antibiotics)
- Once the acute infection is over 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.

Weight loss

**ACUTE PANCREATITIS**DEFINITION

Acute pancreatitis is inflammation of the pancreas which can become chronic. Patients can become very unwell, very quickly.

CAUSES

1. **Alcohol**
2. **Gallstones**
3. Also less commonly
  - o Medications e.g. steroids, HIV drugs, metformin
  - o Trauma
  - o Infections e.g. Mumps
  - o Diabetes

**SIGNS AND SYMPTOMS**

- Severe epigastric pain radiating to back
- Vomiting
- Jaundice
- If chronic pancreatitis: weight loss, fatty stool, diarrhoea

---

**\*\*Note:** Jaundice without abdominal pain is often a sign of pancreatic/gallbladder cancer, examine for a mass\*\*

---

**DIAGNOSIS**

Clinical: typical history and 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 cause e.g. gallstones, alcoholic fatty liver disease.

**COMPLICATIONS**

Chronic pancreatitis, abscess/necrosis of pancreas, pseudocysts, pleural effusion.

**TREATMENT**

- Bed rest
- 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 4 hours (max 400mg/d).
- No surgery is needed.

**PREVENTION**

Gallbladder removal after cholecystitis, decrease alcohol intake.

**LIVER ABSCESS****DEFINITION**

One or more collections of pus within the liver. There are two types of liver abscess:

**1. Amoebic**

Three times more common than bacterial.

The patient may report a recent episode of dysentery.

Treat with metronidazole +/- drainage.

**2. Bacterial**

Mostly from bacteria ascending the bile ducts.

The patient is often more unwell/septic.

Treat with broad spectrum antibiotics +/- drainage.

**SIGNS AND SYMPTOMS**

- Fever, chills, no appetite, nausea.
- 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

Ultrasound is very helpful to diagnose liver abscess.

Stool test to establish the cause.

**TREATMENT**

**If the patient is stable (not too unwell/ not septic):**

Start **metronidazole** PO x 5-10 days:

Adults: 750mg TID

Child 15mg/kg TID

If patient not improving after 3-5 days, follow unwell/septic protocol.

**\*\*Note:** Metronidazole doses for amoeba are higher than usual. Follow the recommended dose given here\*\*

**If the patient is unwell/septic:**

Start **IV ampicillin, gentamicin and PO metronidazole (dose as for stable patient).**

Continue for 10-14 days.



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**\*\*Depending on their size (>6 cm), and response to antibiotic treatment liver abscesses need to be drained surgically\*\***

---

### PREVENTION

Adequate and early treatment of (amoebic) dysentery could prevent liver abscess.

## 13.7 INTESTINAL WORMS

Intestinal worms are very common (*ascaris* / *hookworm* / *trichuris* / *taenia*). The patient is infected by eating with dirty hands, walking without shoes or eating uncooked meat or vegetables.

Worms should be treated to

1. Prevent anaemia and malnutrition.
2. Prevent the following complications:
  - Intestinal obstruction/obstructive jaundice
  - Cysticercosis (*Taenia solium*) – lesions in brain and skin

---

When a patient needs steroid treatment (e.g. prednisolone) for another disease, ALWAYS deworm as the steroids decrease the immune system so the worm infections get worse

---

### SOIL-TRANSMITTED HELMINTHS

#### DEFINITION

Examples of soil-transmitted helminths are *ascaris*, *hookworm* and *trichuris*. These worms spend part of their lifecycle outside the human body, typically in soil. Infection is direct: eggs are transmitted from anus to mouth by eating or cooking with dirty hands (*ascaris*, *trichuris*), or through penetration of the skin by walking with bare feet (*hookworm*, *strongyloides*). The worms live in the intestines of the infected person, but can migrate through the body. Children infected with worms can suffer from impaired growth and intellectual development.

#### SIGNS AND SYMPTOMS

- |  |   |
|--|---|
| • Worms can be seen in the stool or vomit                            | • Malnutrition  |
| • Abdominal pain   | • Complications: <i>ascaris</i> pneumonitis; intestinal obstruction, jaundice   |
| • Epigastric pain is very common, especially with hookworm infection | • Rash from migrating worm: cutaneous larva migrans ( <i>hookworm</i> ), larva currens ( <i>strongyloides</i> ) (see p.229) |
| • Enlarged, swollen abdomen  |   |
| • Itching anus   |   |
| • Chronic anaemia  |   |

**\*\*Note:** Patients with worms have no fever. If fever is present, look for another associated disease\*\*

#### DIAGNOSIS

Stool microscopy test for worms and/or eggs.  
CBC shows eosinophilia.

#### TREATMENT

(**Note:** for pregnant women **NOT** in first trimester)

##### Mebendazole

Child > 1yr/Adult: 100mg BID x 3 days **OR**  
6m-1yr **OR** <10kg: 50mg BID x 3 days

##### Albendazole (If *strongyloides* give 3 days)

Child >2yrs/Adult: 400mg STAT  
Child 1-2yrs: 200mg STAT

**Note:** If suspect worms but do not have a stool sample result then use **albendazole** instead of mebendazole as it kills more types of worms.

**Treat any associated anaemia** (especially hookworm) (see p.109)

---

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.

**TAENIA (TAPE WORM)****DEFINITION**

This worm is long, flat, made up of many short segments and can be up to 10 meters long. Patients get infected by eating undercooked meat. The eggs of these parasites leave the human body in the stools and can infect animals. You can get infected by eating undercooked meat (e.g. cattle, pigs).

**SIGNS AND SYMPTOMS**

- Patient sees worm pieces in stools or vomit.
- Abdominal discomfort, epigastric pain, nausea.
- Patient eats a lot, but loses weight.
- In one form of Taenia (*T. solium* – you get from eating uncooked pork), nodules can be found in the skin or muscles. In neuro cysticercosis, cysts in the brain cause seizures and epilepsy.

**DIAGNOSIS**

Stool microscopy test.

CBC shows eosinophilia.

**TREATMENT**

**Praziquantel**                      Child > 2yrs/Adult:                      20mg/kg STAT

**Note:** tablets need to be chewed before swallowing.

**PREVENTION**

Advise people to:

- Avoid eating raw or undercooked pork and other meats.
- 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 if it is likely to be infected with tapeworm.

## 14

## CHAPTER 14: GENITO-UTERINE DISEASES

## 14.1 URINARY TRACT INFECTIONS (UTI)

## 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.

**In our clinics there is an increasing resistance of bacteria to some antibiotics like amoxicillin and cotrimoxazole. Treatment of UTI should be according to local resistance/sensitivity patterns.**

## CAUSES:

1. Ordinary bacteria, usually <i>E.Coli</i> , can cause acute or chronic UTI	5. Obstruction of urinary tract with stones or mass or congenital abnormality
2. Tuberculosis bacteria causes chronic UTI	6. Intercourse
3. Sexually Transmitted Infections (STI)	7. Pregnancy
4. Urethral catheter	8. 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. Unexplained recurrent UTIs in adults may be caused by urinary tract stones, tumours or STIs. Consider referral.**

**If you suspect a UTI you have to consider whether it is a lower UTI/cystitis (infection of the bladder) or upper UTI/pyelonephritis (infection of the kidney.)** \*\*Note: Cystitis NEVER has fever\*\*

## SYMPTOMS

<b>Lower UTI Cystitis</b>	<ul style="list-style-type: none"> <li>• Dysuria (pain or burning when pass urine NOT HOT URINE WITH FEVER)</li> <li>• Cloudy urine</li> <li>• Blood in urine (haematuria)</li> <li>• Frequent urination</li> <li>• Pain and tenderness lower abdomen</li> </ul>	<b>**NO FEVER**</b>
<b>Upper UTI Pyelonephritis</b>	<b>Symptoms of lower UTI AND/OR</b> <ul style="list-style-type: none"> <li>• Flank pain (kidney area)</li> <li>• Chills and rigors</li> <li>• Sepsis or shock</li> </ul>	<b>**AND FEVER**</b>

## Remember to also ask about:

- Vaginal itchiness: **consider candida** (see p.226)
- Vaginal or penile discharge: **consider STI** (see p. 193)
- If suprapubic pain: is it similar to menstrual pain?: **consider menstrual cramps**
- Recent antibiotic use: may affect the culture being positive

## DIAGNOSIS

Unfortunately the quick tests (dipstick and sediment) that are available to diagnose UTI are not very accurate. Urine culture is the best test to get a definite diagnosis but takes a few days, and is not always available. Follow the protocol below to try and diagnose and treat people correctly:

**Algorithm for investigation and diagnosis of Urinary Tract Infection (UTI) or Pyelonephritis in >3 yrs:**

(If pregnant see obstetric guidelines)

**Patient has following symptoms:**

**Dysuria** (real pain when passing urine not just hot urine in fever) **OR**

**Suprapubic pain** (in bladder area, exclude menstrual pain) **OR**

**Kidney tenderness** (patient points to pain) **AND**

**NO** vaginal itchiness (suggests vaginal candida)

**\*\*Note:** If history of UTI/pyelonephritis or previous positive culture: suspect resistant\*\*



DO DIPSTICK **AND** SEDIMENT on all patients



If sediment epithelial cells  $\geq 5$  re-educate patient on how to get clean sample and repeat



If documented Fever  $>38^{\circ}\text{C}$  **AND/OR** Rigors  $\rightarrow$  **Treat as pyelonephritis** (pg. 99)

If signs of shock see pg. 14

Send culture and follow up results

**INTERPRETATION OF URINE DIPSTICK AND URINE SEDIMENT RESULTS:**

Urine Dipstick	Urine Sediment	Action
Any Positive	Positive	Treat as UTI (Box 1)
Negative	Negative	UTI unlikely (Box 2)
Strong Positive	Negative	Treat as UTI (Box 1)
Weak Positive	Negative	Maybe UTI (Box 3)
Negative	Positive	Maybe UTI (Box 3)
<b>Urine dipstick:</b> Any positive = WBC $\geq 1$ <b>OR</b> nitrite positive Weak positive = WBC 1 <b>OR</b> WBC 2 only (nitrite negative) Strong positive = WBC 3 <b>AND/OR</b> nitrite positive Negative = WBC 0 <b>AND</b> nitrite negative		<b>Urine sediment:</b> Positive = WBC $\geq 10$ <b>AND</b> Epithelial cells $< 5$ Negative = WBC $< 10$ Contaminated = Epithelial cells $\geq 5$ (need to repeat)

**BOX 1: UTI Likely**

1. **Send culture<sup>2</sup>** and follow up results
2. **Check G6PD<sup>1</sup>**
3. Advise to drink lots of water
4. Give antibiotics:

**Nitrofurantoin 50mg QDS**

FEMALES: for 3 days

MALES: for 7 days

**\*\*Note:** do not give nitro in G6PD deficiency or in late stage of pregnancy\*\*

**BOX 2: UTI Unlikely**

1. **DO NOT** send culture
2. Consider other diagnoses e.g. STI, renal stone
3. Advise patients to come back if symptoms continue

**BOX 3: Maybe UTI**

**Temperature  $37.5-37.9^{\circ}\text{C}$  or complain of fever:**

1. **Send culture<sup>2</sup>** and follow up results
2. Admit
3. Do not give paracetamol
4. Rehydrate with water
5. Repeat urine sediment and stick next day

**IF DOCUMENTED FEVER  $>38^{\circ}\text{C}$  TREAT AS PYELO**

**Temperature  $<37.5^{\circ}\text{C}$ :**

1. Send culture<sup>2</sup> and follow up results
2. Follow up 3-4 days (telephone no.) with culture result
3. Rehydrate with water
4. If worse come back

**\*\*Note:** If patient really cannot be admitted or come for follow up then follow box 1\*\*

<sup>1</sup>**Note:** Nitrofurantoin and ciprofloxacin can cause haemolysis in G6PD deficiency (see p.113). If G6PD deficient **do not use nitrofurantoin**. You can still use ciprofloxacin as it is less likely to cause a reaction but it is very important to advise your patient to stop the drug and to return to IPD if symptoms of **jaundice** or **dark urine** occur

<sup>2</sup>**Note:** if your clinic does not have culture available then treat as a case by case basis using clinical judgement

#### Extra-information you can get from the tests:

##### Urine Dipstick:

- **Ketones:** sign of dehydration, if ketones high check dextrose – if dextrose high may be a sign of diabetic ketoacidosis (*diabetic emergency see p.22*)
- **Glucose:** sign of diabetes see p.53
- **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

##### Urine Sediment:

- **RBC casts, granular casts or waxy casts:** consider renal failure, discuss with doctor –check BUN/ Creatinine
- **WBC casts:** suggest infection or inflammation
- **Crystals e.g. phosphate, calcium:** consider renal stones

.....

**In cases of recurrent cystitis, think about bladder stone, kidney stone or STIs.**  
**Men do not usually get cystitis. Think about STIs or prostatitis (p.193) in a man with UTI symptoms.**  
**Recurrent UTIs in children should be investigated to prevent kidney damage.**

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#### PYELONEPHRITIS TREATMENT

1. **DR-ABCDE if unwell**
2. Admit to IPD
3. Send urine culture
4. Antibiotics
  - Patient not vomiting/septic: PO **ciprofloxacin** 500mg BID for **14 days**
  - Patient vomiting/septic: IV **ceftriaxone** 1g OD: treat with IV for 24 hours after temperature settles then change to PO **ciprofloxacin** or a sensitive antibiotic if urine culture result is back to complete **14 days**.
5. Treat pain and fever
6. Monitor urine output
7. Advise to drink plenty of water (3-4 litres/day for adults)
8. IV fluids if not able to drink water/ signs of shock
9. Ultrasound scan of kidneys (if available) to look for any abnormal anatomy or any stone

**\*\*Note: It is important to check result of culture and change antibiotics if the bacteria is resistant. Remember: 1 in 10 antibiotics in the UTI study did not work against the bacteria\*\***

#### PREVENTION

Drink at least 2 litres of water per day. Urinate at least 3 times per day, most important before bedtime and immediately after intercourse. Encourage good hygiene. Avoid constipation, as constipation reduces the bladder's ability to empty.

## PROSTATITIS

#### DEFINITION

Inflammation of the prostate.

#### SYMPTOMS & SIGNS

- |  |  |
|--|--|
| • Fever  | • Blood in urine (haematuria)                  |
| • Pain and tenderness in the rectum or when pass stool | • Pain or burning when passing urine (dysuria) |
| • Often very painful rectal examination                | • Frequent urination                           |
| • Cloudy urine   |  |

#### DIAGNOSIS

- **Rectal examination.**
- **Examine urine:** cloudy or bloody urine.
- **Urine dipstick and urine sediment** positive

**TREATMENT**

1. **DR-ABCDE if unwell**
2. Treat in IPD until the patient's temperature returns to normal.
3. Prevent dehydration: drink plenty of water (3-4 litres/day for adults).
4. If the patient cannot drink, give IV fluids and monitor urine output.
5. Treat pain and fever
6. Avoid constipation – advise high fibre diet
7. 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.

**14.2 URINARY 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 (see below).

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**In patients with repeated urinary infections look for stones**

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**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. (see p.101)
- Treat the pain according to the severity:

1. **Paracetamol**
2. **Ibuprofen, diclofenac, aspirin** PO or IM are alternatives (see p.28)
3. **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
  - Do not use for pregnant women**
4. **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).

## 14.3 ACUTE KIDNEY INJURY

### DEFINITION

Acute kidney injury (AKI) is a sudden loss of kidney function. It is very important to treat AKI quickly as patient's can become very unwell and it can lead to complications including death. It may also lead to chronic kidney disease.

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**Normal urine output should be at least 0.5ml/kg/hr in adults and 1ml/kg/hr in children**

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### SIGNS AND SYMPTOMS

Most often will have symptoms of the cause (e.g. diarrhoea causing dehydration, flank pain from renal stone). May also complain of:

- Fatigue
- Headache
- Nausea/Vomiting
- Loss of appetite
- Low urine output (oliguria)
- **No urine output (anuria) \*\*DANGER SIGN\*\***
- Oedema

### CAUSES

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 creatinine

BUN and creatinine are blood tests that show kidney function. If the BUN increases much more than the creatinine increases (often BUN:Creat >20:1) then it is a sign that it is a problem before the kidney e.g. dehydration.

**Normal range in adults** (\*\*Note: reference range is for SMRU biochemistry machine, normal ranges can be slightly different for each lab\*\*):

- BUN: 5-23mg/dL
- Creatinine: Males: 0.67-1.17mg/dL; Females: 0.61-0.95 mg/dL (higher in males as higher creatinine with more muscle mass)

**\*\*Note:** BUN can also increase if there is an upper GI bleed (see p. 78)\*\*

#### Creatinine Clearance

You can use the following equation to help you calculate the estimated creatinine clearance. This is another way that tells you how good the kidneys are working. The lower the creatinine clearance the worse the kidneys are working. This is useful to know when prescribing drugs in renal failure e.g. do not use gentamicin if Creatinine Clearance <20ml/minute or reduce the dose of ampicillin if Creatinine Clearance <10ml/minute.

$$\frac{(140 - \text{Age}) \times \text{weight(kg)} \times (0.85 \text{ if female})}{72 \times \text{Serum Creatinine}}$$

### TREATMENT

- If likely due to dehydration then 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.

---

**\*\*Note: no urine output (anuria) after fluid replacement is a DANGER SIGN, and means that the patient may need dialysis (artificial kidney treatment). If have catheter make sure it is not blocked making you think that the patient is not passing urine. If have no urine output discuss with the doctor about referring to hospital.\*\***

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## 14.4 ACUTE GLOMERULONEPHRITIS

### DEFINITION

Acute Glomerulonephritis (AGN) is an inflammation of the filter of the kidneys. There are many causes of this syndrome. 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.223) or throat infection (e.g. tonsillitis see p.200). It can sometimes follow other infections like pneumonia, typhoid, leptospirosis, malaria, hepatitis C, or measles. 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:

- Smoky, rusty 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% of cases.
- If oedema is generalised there may be signs of circulatory congestion and pulmonary oedema: difficulty breathing, crackles at lung bases.

### 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.

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Ask for history of previous skin or throat infections. Look at the skin to find signs of old impetigo

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### 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):
 

<b>PO Furosemide</b>	Child 1m-12yrs:	0.5-2mg/kg 2-3 times daily (max 80mg/d)
	>12yrs/Adult:	20-40mg OD
- Treat complications: hypertension (see p.31), acute pulmonary oedema (see p.37)
- Acute phase usually lasts 6-8 weeks, haematuria and proteinuria usually disappears in 1 year, regular follow ups are needed.

### PREVENTION

Effective treatment of tonsillitis or impetigo (see p.200 and p.223). Treatment within 10 days of onset can prevent AGN. Prevent other infections that can cause glomerulonephritis. Control blood sugar carefully in diabetes mellitus, and control blood pressure in hypertension.

## 14.5 NEPHROTIC SYNDROME

### DEFINITION

In nephrotic syndrome, large amounts of protein are found in the urine (proteinuria) and blood levels of protein decrease (hypoalbuminaemia). This 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 carrying out a renal biopsy. It is most common in children 2-12 years old. In children, the most common cause is Minimal Change Disease and is usually responsive to steroids.

### SIGNS AND SYMPTOMS

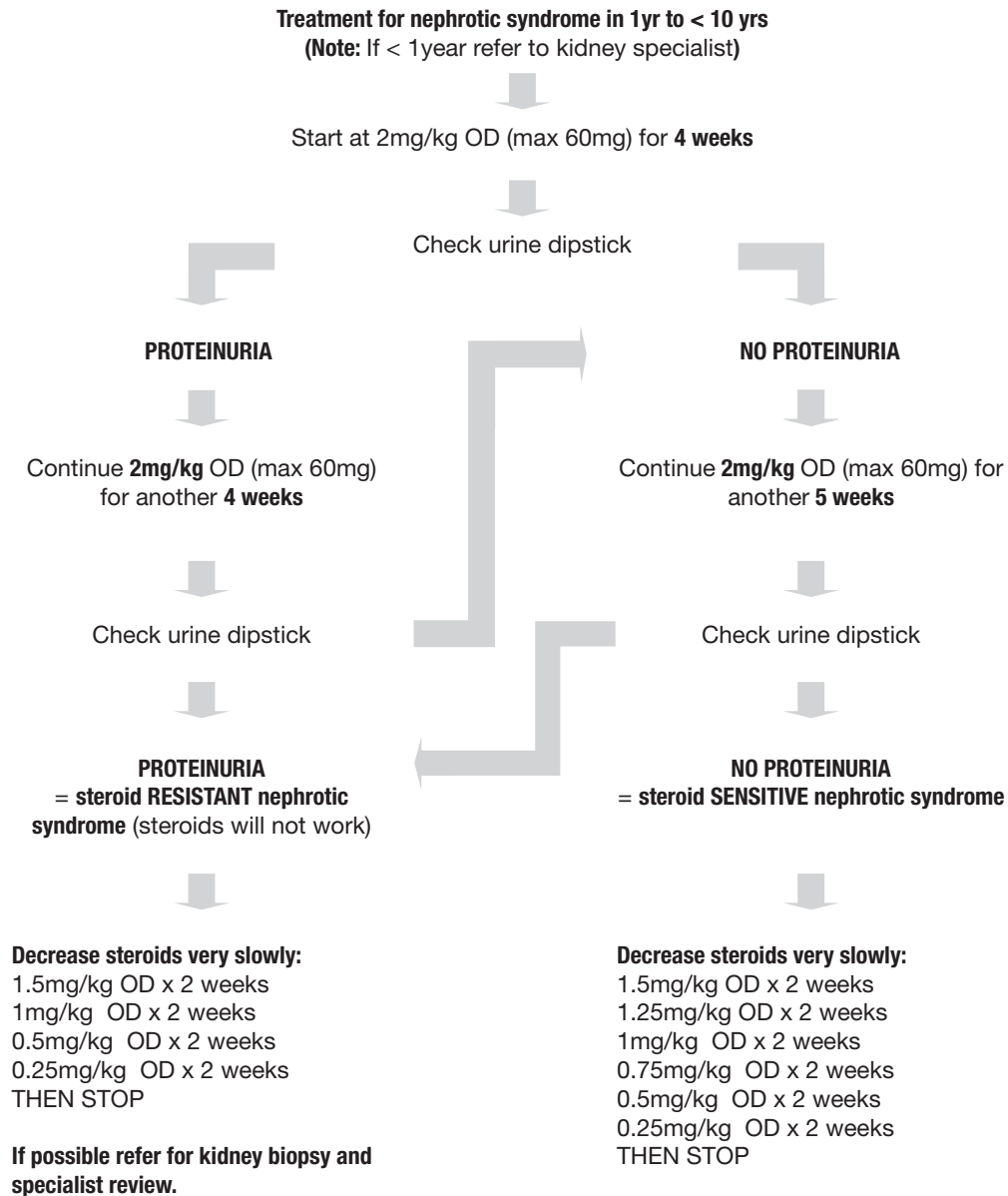
- Generalised oedema (in severe cases there is pulmonary oedema)
- Reduced urine output (oliguria)
- Protein in the urine (proteinuria)
- Low albumin level in the blood (hypoalbuminaemia)
- Usually normal renal function initially
- May have high BP



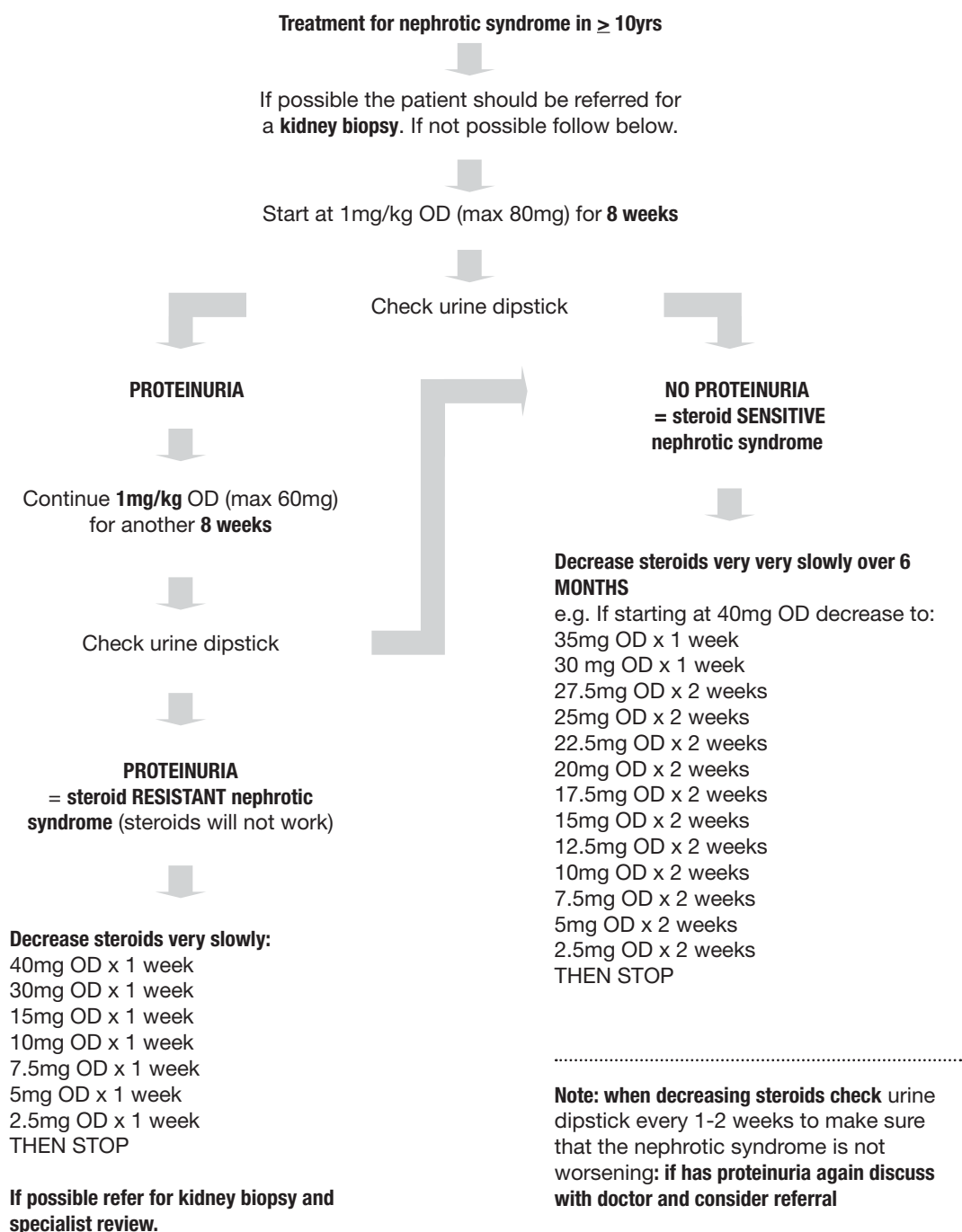
**TREATMENT**

Find and treat the underlying cause (e.g. diabetes mellitus, infection)

All patients should be treated in IPD. Drug therapy of nephrotic syndrome consists mainly of steroids (such as prednisolone) and diuretics.

**1. Prednisolone:**

**Note:** 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 with doctor and consider referral**



**\*\*Note:** 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\*\*

.....

**Notes about steroids:**

- **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 carefully, 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.)

**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** to prevent the spreading of worms **BEFORE** starting steroids (see p.97)
- Be sure that your patient has no active TB or amoebic disease (steroids make them worse).

**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 dipstick)

.....  
**\*\*Note: Patients who recover on prednisolone can relapse\*\***

**Ask the patient to return to OPD as soon as he/she becomes slightly oedematous. Restart the treatment.**  
 .....

**FOLLOW UP**

Nephrotic syndrome can last a few years and in some forms can cause renal failure

It is important to follow patients regularly for first 6 months and then case by case for at least 2 years if possible

Advise the family that if in between follow up the patient gets the symptoms again to come back to clinic.



## 15

## CHAPTER 15: HAEMATOLOGY DISEASES

## 15.1 ANAEMIA

## DEFINITION

Anaemia is a condition where the haematocrit (Hct) or haemoglobin (Hb) is below normal levels in the circulating blood (taking into account age, sex and pregnancy state). When this happens, the risk is that the red blood cells are not carrying enough oxygen to the tissues of the body.

Anaemia can occur from:

- a) increased red blood cell loss (e.g. haemolysis and haemorrhage), AND/OR
- b) decreased red cell production (e.g. nutritional deficiencies and bone marrow depression).

## Normal Hct/Hb levels:

	Hb (g/dl)	Hct %
Adult males	< 13.5	< 41
Adult females (non-pregnant)	< 12	< 36
Adult females (pregnant)*	< 10	< 30

\*Note: some fall in Hb is physiological in pregnancy

## Anaemia is a common health problem in the tropics.

You, as a health worker, can help prevention by:

1. Giving nutritional advice
2. Distributing iron and folate tablets (NOT in cases of Thalassemia)
3. Deworming the population at regular intervals.

## CAUSES

(Note: the most common causes of anaemia are highlighted in **bold**)

## ACUTE

- **Malaria** (acute destruction of RBCs) (see *Malaria Guideline*)
- Acute bleeding (GI tract, genital tract, artery damage in accident, pregnancy-related haemorrhage e.g. PPH)
- G6PD deficiency

## CHRONIC

- **Nutritional deficiencies** (see p.186)
- (lack of iron (ferrous), folate or vitamin B12 in diet)
- **Hookworm and ascaris infestation** (see p.97)
- **Repeated pregnancies** (mother anaemia)
- **Prolonged breastfeeding without weaning foods** (infant anaemia)
- Peptic ulcer (see p.80)
- Alcohol excess (see p.154)
- Thalassemia (see below)
- Chronic bleeding, heavy menstruation
- Cancers (see p.191)
- Chronic infections (HIV, TB) (see p.119/216)
- Liver (see p.92) and kidney disease
- Tropical splenomegaly
- Aplastic anaemia (bone marrow failure)

Very often anaemia has **more than one cause**. Supplementing ferrous sulphate (FS), Folic Acid (FA) and deworming can help many people feel better.

## To help differentiate causes you can use the MCV:

MCV is the mean corpuscular volume therefore the size of the red blood cell. Different sizes are found in different diseases.

Low MCV <80 fL*	'Microcytic'	Iron deficiency anaemia Thalassemia Hookworm/ascaris infection Chronic bleeding, heavy menstruation
Normal MCV 80-100 fL*	'Normocytic'	Haemolytic anaemia Acute blood loss e.g. peptic ulcer Aplastic anaemia Anaemia of chronic disease/infections Tropical splenomegaly
High MCV >100 fL*	'Macrocytic'	B12/folate deficiency Hypothyroidism Alcohol excess

\*Figures for adults

## SIGNS AND SYMPTOMS

Anaemia affects all population groups. 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. In the milder form, anaemia is 'silent', without symptoms. Without treatment, this mild anaemia can worsen and become a cause of chronic ill health (such as impaired fetal development during pregnancy and delayed development and increased risk of infection in young children).

## 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 (**not** at rest)
- Pallor (conjunctivae, palm of hands, nail beds)
- Normal heart rate and respiratory rate at rest.

## SEVERE CHRONIC ANAEMIA

Sometimes people can have severe anaemia (Hb < 6) with normal pulse and respiratory rate at rest. This is because the anaemia has been very slow to develop (e.g. chronic hookworm infection, repeated malaria attacks) or they have had a low haemoglobin count since birth (e.g. thalassaemia).

- Extreme tiredness and weakness
- Difficult breathing and palpitations on minimal effort
- Very pale
- Often heart murmur
- Normal heart rate and respiratory rate at rest

## 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

## DIAGNOSIS

Clinical and Lab: Hb or Hct, CBC (to check MCV)

## TREATMENT

### EMERGENCY TREATMENT

If signs of acute symptomatic anaemia/hypovolaemic shock follow DR-ABCDE: (see p.12)

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>SEVERE ANAEMIA/ HYPOVOLAEMIC SHOCK</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	<b>Oxygen</b>
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	<b>Put in 2 biggest (16G or 18G) IV cannula – take bloods e.g. Hct, CBC, MS, dextrose etc.</b> <b>Fluid bolus NSS 1L (DO NOT GIVE if suspect heart failure)</b> <b>Crossmatch and transfuse blood</b> If very low BP raise legs to level above head Try to stop the bleeding e.g. compression of artery
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	Give dextrose if low Give <b>medications according to cause</b>
<b>E</b>	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.
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

## NON-EMERGENCY TREATMENT

**Treat the anaemia:**

- Treatment dose of **ferrous sulphate (FS)** and **folic acid (FA)**.
- 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 Hb <6 /Hct <18, discuss with doctor about transfusion.
- Anaemic heart failure is very difficult to treat successfully and, if possible, should be prevented by providing treatment before reaching this stage. Treat the pulmonary oedema (see p.37).
- **All patients with anaemia should be dewormed** (see p.97).

**TREATMENT DOSE**

**Ferrous sulphate** Adult: 200mg TID      **Folic acid** Adult: 5mg OD

After 6 weeks treatment dose switch to prophylactic dose for a total of 3 months (if Hb/Hct normalised)

**PROPHYLACTIC DOSE**

**Ferrous sulphate** Adult: 200mg OD      **Folic Acid** Adult: 5mg/week

One tablet (200mg) of ferrous sulphate contains 65mg of iron.

**TREAT THE CAUSE****1. Severe bleeding with signs of shock**

- See *emergency treatment above*
- If severe bleeding transfer to hospital if possible (**ABCDE first**)
- Give ferrous sulphate and folic acid treatment dose after transfusion.

**2. Malaria**

- Give appropriate anti-malaria drugs according to malaria guidelines.
- Give FS only when the malaria smear is negative.
- Admit to IPD if there are signs of acute anaemia / anaemic heart failure, and if severe or hyper PF malaria.

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Development of severe anaemia is very rapid with malaria, especially in children.  
It is the first cause of death in young children with malaria.

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- If patient has severe or hyperparasitaemic malaria, the World Health Organisation recommends to transfuse if Hb <7 or Hct <20 (the malaria parasite will still destroy more red blood cells). At SMRU the guidelines may be different – check the malaria guidelines for up to date advice.

**3. Hookworm, trichuris or ascaris in stool or anaemia of unknown cause**

- De-worm (see p.97)
- Give FS and FA treatment dose.

**4. Poor nutrition, pregnancy and breastfeeding**

- Give nutrition advice
- Give FS and FA prophylaxis dose for the duration of the pregnancy. When Hct <30% look for sign of thalassaemia or worms and give treatment dose FS and FA. (see *obstetric guidelines*)

**If a patient remains anaemic despite treatment consider the following diagnoses:****1. Poor compliance**

Compliance for some people is difficult. They remain anaemic because they cannot tolerate the side-effects of oral FS which include vomiting, epigastric pain or diarrhoea/constipation. Discuss with the doctor about alternatives in these patients.

**2. Vitamin B12 deficiency**

There is usually a high MCV. The laboratory technician can check for multi-segmented neutrophils (> 5 lobes) and large red blood cells on a thin smear of routine malaria smear. 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 **folic acid** 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.

**4. Hypothyroidism**

If no other cause for anaemia is found and MCV is high consider checking thyroid function.

**5. Haemolytic anaemia**

Caused by haemolysis (destruction of red blood cells). Two genetic causes of haemolysis found in this area are Thalassaemia and G6PD deficiency. See below.

---

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**

Provide FS and FA to all pregnant women in prophylaxis doses and provide advice on nutrition. Prevent (malaria) infections and treat early. Deworm all pregnant women (after the 1<sup>st</sup> trimester) and children of school-going age.

**15.2 THALASSAEMIA****DEFINITION**

Thalassaemia is a genetic disease caused by abnormal or decreased haemoglobin production. Haemoglobin is found in the red blood cells, and is the part of the cell that carries the oxygen needed for the tissues to work. Haemoglobin is made up of two alpha ( $\alpha$ ) and two beta ( $\beta$ ) chains. Thalassaemia results in decreased or absent haemoglobin chains: In  $\alpha$  thalassaemia the  $\alpha$  chains are affected and in  $\beta$  thalassaemia the  $\beta$  chains are affected.

There are many variations of the disease from no chains being produced by the body to minor changes in the chains. So the disease ranges from being extremely severe to patients not even being aware they have the disease. On the Thailand-Myanmar border  $\alpha$ - /or  $\beta$ - thalassaemia occur in approximately 10% of people.

**1. BETA THALASSAEMIA Minor:** a small portion of the total Hb in the body is affected.

<b>SYMPTOMS</b>	Mild, well-tolerated anaemia, often noticed in pregnancy
<b>DIAGNOSIS</b>	CBC, Thalassaemia test
<b>TREATMENT</b>	Folic acid and vitamin B and C, do not overload with iron

**2. BETA THALASSAEMIA Intermedia:** a greater portion of the total Hb in the body is affected.

<b>SYMPTOMS</b>	Well-tolerated anaemia that gets worse with age, splenomegaly
<b>DIAGNOSIS</b>	CBC, Thalassaemia test
<b>TREATMENT</b>	Check Hb regularly Folic acid and vitamin B and C, do not overload with iron Give blood only at times of severe anaemia Splenectomy can sometimes help

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Beta Thalassaemia minor and intermedia should be suspected in all patients with mild anaemia that does not improve with ferrous sulphate or folic acid.

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**3. BETA THALASSAEMIA Major:** the majority of Hb in the body is affected.

<b>SYMPTOMS</b>	Severe anaemia, starting in the first year of life Child does not grow and develop well Child contracts many infections Abnormal bone growth, especially in the face Enlarged liver and spleen (hepato-splenomegaly)
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**Without transfusion**

Death usually occurs within one year

**With adequate transfusion**

Child growth and development are usually good, school attendance is improved  
Infections are reduced, overall health is improved, bone deformities improve  
Symptoms of iron overload appear after about 10 years, with liver disease and cardiac toxicity  
Death is usually due to cardiac iron overload



<b>With not enough transfusion</b>	<p>Anaemia with reduced growth, slow development and bone deformity.</p> <p>Enlarged spleen (splenomegaly)</p> <p>Intermittent fever</p> <p>Bleeding</p> <p>Death usually occurs at 20-30 years of age from cardiac iron overload</p>
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**DIAGNOSIS** CBC, film (target cells), thalassaemia test

#### TREATMENT

- Consider regular transfusions to keep Hb > 8, Hct > 24.
- Transfusion is the only effective treatment, but over time this causes iron levels to increase in the body which damages some organs, causing death (consider giving desferrioxamine at each blood transfusion, which can help reduce iron overload).
- 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.

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**Note:** pregnancy makes the anaemia of thalassaemia worse and this may be the first time a patient presents with acute or chronic anaemia.

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## 15.3 G6PD DEFICIENCY (= Glucose-6-Phosphate Dehydrogenase Deficiency)

### DEFINITION

This disease is caused by a deficiency of the enzyme G6PD in the red blood cells that is important for these cells to function. It is a genetic disease which is present from birth. It is usually more severe in men, but women can also have G6PD deficiency which can be mild to severe. People with this disease usually have no symptoms, although some have chronic anaemia.

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**Note:** Some patients suffer from acute haemolytic anaemia (destruction of red blood cells) if they get certain infections or take certain drugs. However, reactions vary: some sufferers might not have any crisis if taking one drug whilst other patients will have a crisis with the same drug at the same dose.

---

### SIGNS AND SYMPTOMS

Most patients have no symptoms. Some have chronic anaemia. Acute haemolytic anaemia occurs after taking certain drugs (see below) or having an infection or 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

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If your patient has chronic anaemia or develops pallor, jaundice or dark urine after taking one of the drugs described below, you should suspect G6PD deficiency.

---

### DIAGNOSIS

A blood test will tell you if a patient has this deficiency. However, there is no test available which will tell you if a patient will be at risk of having a haemolytic crisis when taking certain drugs.

**Note:** do not test for G6PD until 2 months after a case of acute anaemia as you may get a false result.

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If a female has moderate deficiency, her G6PD rapid test may be normal, but she may still be at risk for haemolysis. This haemolysis will usually not cause severe symptoms.

---

### TREATMENT

- Stop any drug that could have caused the haemolysis
- Treat any infection
- Usually the haemolysis is self-limiting and treatment is not needed
- Blood transfusion can save the life of the patient in severe cases of anaemia
- Check the patient urinates enough, encourage the patient to drink plenty of fluids

Try to avoid/be careful when prescribing the following drugs:

**\*\*Note:** 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\*\*

---

**DRUGS AND CHEMICALS THAT CAUSE SEVERE HAEMOLYSIS IN G6PD DEFICIENT PEOPLE:**

Dapsone and other sulphones  
Methylene Blue  
Niridazole  
Nitrofurantoin  
Primaquine  
Quinolones (including ciprofloxacin, norfloxacin, ofloxacin, nalidixic acid)  
Sulphonamides (including co-trimoxazole)  
**Note:** mothballs may contain naphthalene which also causes haemolysis

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**DRUGS WITH POSSIBLE RISK IN G6PD SUBJECTS**

Aspirin  
Chloroquine (acceptable in acute malaria)  
Vitamin K analogue (menadiol sodium phosphate)  
Quinine (acceptable in acute malaria)

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**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 future health workers are aware

## 15.4 TRANSFUSION

**Indications for transfusion**

Transfusion is only possible where blood can be tested for 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 state of the patient takes priority.**
- **To decide if you need to give an URGENT transfusion, do not look only at the lab result: look at the patient: look for pallor, weakness, check the pulse, RR and BP.**
- **The clinical status of the patient is more important to the decision than the Hb/Hct result.**

**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 for level of Hct)

**Do NOT transfuse when:**

- Signs of moderate chronic anaemia (see p.109)

**Consider transfusion:**

- Signs of severe chronic anaemia with Hb < 6 Hct < 18  
Discuss the case with the doctor\*

*\*There is no international consensus about the level of Hb at which to give a transfusion in a patient with severe anaemia but with no signs of shock. Some doctors will transfuse a patient with Hb higher than 6 g/dl, other doctors will not transfuse a patient even if Hb is 4. This decision has to be taken with the doctor and it will depend on the patient's age, general health conditions, social situation and the cause of the 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, give only folic acid and de-worm.











**URGENT = NOW:** if you wait, the patient can die.  
Insert the largest IV cannula, give IV fluid and find a donor quickly

### Steps to follow to give a transfusion:

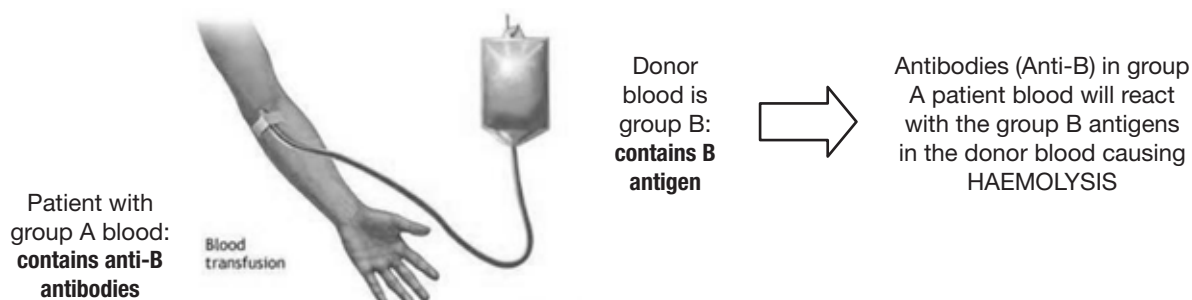
#### For the PATIENT:

1. Check the patient's blood group and rhesus group (+ or -).
2. Insert the largest cannula possible in a large vein - the smaller the cannula, the slower the blood flow.
3. Give an infusion of NSS to keep the vein open or give blood directly.
4. Look for a donor with the same blood group as the patient.
5. In an emergency, if you cannot find a donor of the same group, follow the rules of 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	

	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in Plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in Red Blood Cell	 A antigen	 B antigen	 A and B antigens	None

For example:



#### For the DONOR:

##### 1. CHECK THE GENERAL CONDITION OF THE DONOR:

- No pregnant women, no people under 17 or over 65 years
- No fever
- No jaundice in previous 6 months
- No donation of blood in previous 3 months
- BP normal
- No clinical anaemia
- No behavioural risk factors for STD and/or HIV

##### 2. TAKE BLOOD FROM THE DONOR IF:

- Malaria smear negative
- Hb > 11 g/dl\*
- Cross match shows no clotting
- Hepatitis B and HIV negative
- (if tested, Hepatitis C and VDRL negative)
- **G6PD not deficient (\*\*Note: this is new\*\*)**

##### 3. TAKE BLOOD FROM THE DONOR

- 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.

\* Sometimes it is very difficult to find a donor. Relatives of the patients might be willing to donate blood. If their Hb is < 11 g/dl but > 9 g/dl and the patient's life is in danger because of anaemia, you can decide to take blood from the relative even if the level of Hb is not ideal (giving a treatment course of ferrous sulphate + folic acid).

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**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.

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**Give the blood transfusion to the patient:**

**1. Calculate the amount of blood to give**

Adult: 1-2 bags.  
Children < 1 yr 15ml/kg  
> 1 yr 20ml/kg (max of one bag)

This amount can be repeated depending on the severity of the anaemia.

**2. Make sure you are giving the right blood to the right patient.**

**3. Rate of transfusion:**

The transfusion should usually last approximately **3 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. severely malnourished children, old people, people with heart / kidney problems, patients with chronic anaemia) give it **over 4 hours** and give **furosemide** 20mg PO half way

**4. When to check vital signs:**

- Before starting
- After 5 and 15 minutes
- Then after every hour until 1 hour post transfusion.

**5. Never mix blood with D5W (this can cause haemolysis) or ringer (this can cause clotting): you can mix blood with NSS.**

**6. Never add medication to the blood.**

**7. Do not shake the blood.**

- STOP the transfusion when the cells (red part of the blood) have been given. Patients need the red blood cells to increase the Hb.
- The plasma (clear part of the blood) is less useful for the patient and increases the risk of pulmonary oedema.

**Note: in cases of acute bleeding, also give the plasma part of the blood.**

**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.

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**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's condition is still severe, 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 patient is going into shock (see *shock p.14*).

**2. Pulmonary oedema**

AT RISK: Old people, people with known heart / kidney problems, patients with chronic anaemia.

SYMPTOMS: Increased respiratory rate, difficult breathing, cough, headache, crepitations/crackles in both lung bases.

TREATMENT: *See treatment acute heart failure p.37*

- Put the patient in a sitting position.
- Give oxygen if available.
- Give **Furosemide** IV adults 40mg, repeat the dose after ½ hour if no improvement

### 3. Allergic reactions

#### (a) Skin reactions

SYMPTOMS: Urticaria, big red itching lesions.

TREATMENT:

- Give **chlorpheniramine** PO (adult 4mg).
- If no other symptoms and the skin rash goes away in ½ hour, ask the doctor if you can start the transfusion again, but observe carefully.

#### (b) More severe allergic reactions (anaphylaxis) (see *Anaphylactic shock*, p.14).

SYMPTOMS: Oedema, difficult breathing, wheezing, high BP, then low BP, sometimes diarrhoea and vomiting.

TREATMENT:

- DR-ABCDE
- Give **oxygen**
- Give **adrenaline** 1:1000 IM
- Give **NSS** fast.
- Give **hydrocortisone** IM/IV
- Give **chlorpheniramine** IV



# 16

## CHAPTER 16: HIV AND AIDS

### DEFINITION

Acquired immune deficiency syndrome (AIDS) is a collection of symptoms and infections resulting from damage to the immune system caused by the human immunodeficiency virus (HIV) in humans. CD4 T-cells are a type of lymphocyte (which are a type of white blood cell) that co-ordinate the immune system's response to certain micro-organisms such as viruses. HIV can infect and kill CD4 T-cells, as well as some other types of cell. When many CD4 T-cells have been destroyed by HIV, the infected person is no longer able to fight against infections or certain types of cancer.

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 may develop some types 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.
- However if an infant contracts HIV from a mother, this course is much shorter and mortality without treatment is very high at 24 month of age (50%).
- People with HIV infection can often live a full and productive life for many years. To illustrate this we often use the term **person living with HIV** (or PLWH). Taking medication can often prevent opportunistic infections. Antiretroviral therapy (ART) slows down the progress of the virus and can greatly improve quality of life, but does not get rid of the HIV infection.

### TRANSMISSION AND PREVENTION

ROUTE OF TRANSMISSION	PREVENTION
Sexual Contact.	<ul style="list-style-type: none"> <li>• Abstain from sexual contact OR</li> <li>• Be faithful to one uninfected partner OR</li> <li>• Use male or female condoms</li> </ul> <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> <li>• Early diagnosis and treatment of sexually transmitted infections (STI).</li> <li>• Post exposure prophylaxis (PEP) (medicine you give immediately after the exposure). In the event of rape this may reduce the risk of HIV transmission (see p.7).</li> </ul>
Contaminated syringes and needles and other sharps e.g. intravenous drug users, health workers, tattoos.	<ul style="list-style-type: none"> <li>• Avoidance of injecting drug use.</li> <li>• Do not share needles and syringes and always use a new sterilised needle and syringe.</li> <li>• Do not share cutting implements e.g. tattooing needles, ear piercing needles, razor blades.</li> <li>• Universal precautions for health workers (see p.5).</li> <li>• PEP in the event of occupational exposure may reduce the risk of HIV transmission (see p.7).</li> </ul>
Infection by blood and blood products e.g. blood transfusion by HIV contaminated blood.	<ul style="list-style-type: none"> <li>• Follow protocol for transfusion (see p.114).</li> <li>• Screening of donors with a questionnaire to assess risk of HIV infection.</li> <li>• 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.</li> </ul>
Mother to child transmission.	<ul style="list-style-type: none"> <li>• See Prevention of Mother to Child Transmission (PMTCT) below.</li> </ul>

### DIAGNOSIS

#### HIV testing

#### WHY SHOULD YOU TEST FOR HIV?

##### 1. Screening for blood transfusion

As HIV can be transmitted through blood transfusions 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 (See *transfusion p.114*).

**Note:** 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:

<p><b>CONFIDENTIALITY</b> 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.</p> <p><b>PRE-TEST COUNSELLING</b> 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.</p> <p><b>INFORMED CONSENT</b> 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. <b>Informed consent needs to be obtained from the person, not the relatives.</b></p>	<p><b>POST-TEST COUNSELLING</b> 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.</p> <p><b>LABORATORY TESTING</b> Testing can be done either with rapid tests in the clinic or with ELISA or Western Blot in the hospital. <b>A minimum of 2 different tests should be used.</b> To make the right diagnosis, protocols should be followed strictly, and quality must be assured.</p> <p><b>REFERRAL FOR APPROPRIATE CLINICAL, NUTRITIONAL, PSYCHOLOGICAL AND SOCIAL SUPPORT SERVICES</b> 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.</p>
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## SIGNS AND SYMPTOMS

### 1. 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.

**Note:** In primary HIV infection even if the test is negative, the person can transmit the virus to others as the HIV test will only become positive when the body starts to produce antibodies (2 weeks to 3 months after the infection).

### 2. Post-acute infection symptoms:

Symptoms in HIV are used to assess how severe the disease is.

#### Clinical staging according to WHO (World Health Organisation):

##### Clinical Stage 1

- No symptoms.
- Persistent generalised lymphadenopathy.

##### 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.

##### Clinical Stage 3: Advanced HIV Infection (usually associated with a CD4 of less than 350cells/mm<sup>3</sup>)

- 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.



**Clinical stage 4: Severe disease (AIDS) (usually associated with a CD4 of less than 200cells/mm<sup>3</sup>)**

- HIV wasting syndrome (severe malnutrition).
- Severe disseminated extra-pulmonary TB.
- Severe infections (e.g. cryptococcal meningitis, oesophageal candidiasis, pneumocystis carinii pneumonia (PCP), cerebral toxoplasmosis).
- Cancers (invasive cervical cancer, lymphoma and Kaposi's sarcoma).

**TREATMENT**

There are many different parts involved in the treatment of HIV. Below will discuss the following topics:

1. **General management of a patient with HIV**
2. **Anti-retroviral therapy**
3. **Treatment of common HIV related illnesses and opportunistic infections (OI)**
4. **Prophylaxis to prevent OIs**
5. **PMTCT and HIV in pregnancy**

**16.1 GENERAL MANAGEMENT**

The management of a newly diagnosed HIV positive person should address all the person's needs, not just their medical ones. A number of people may be involved in the person's care, for example a VCT counsellor, medics, RH staff, and community social workers. It is important to maintain confidentiality and only reveal a person's HIV status with their consent and only if **absolutely necessary** for the care of that person. The order in which the following should be done will depend on the person's clinical and psychological state.

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**:
  - Check for symptoms of TB (see p.216).
  - Refer to TB chapter p.216 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/mm<sup>3</sup>.

6. Determine the need for **prophylaxis of opportunistic infections** and antiretroviral therapy based on clinical stage or CD4 count.
7. **Nutritional support**
  - Provide nutrition counselling.
  - 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 (ART)

According to the World Health Organisation treatment should be given to:

<b>Adults/Child &gt;5yrs:</b>	CD4 <500 cells/mm <sup>3</sup> <u>OR</u> If WHO clinical stage 3 or 4 disease (does not matter what the CD4 count is).
<b>Child 24 - 59 months:</b>	CD4 count ≤750 cells/mm <sup>3</sup> <u>OR</u> If %CD4 ≤25% whichever is lower (does not matter what the WHO clinical stage is).
<b>Child &lt;24 months:</b>	Everyone (does not matter what the CD4 count/ WHO clinical stage is).

There are 3 classes of drugs currently in use:

- NRTI's (Nucleoside Reverse Transcriptase Inhibitors): 3TC, d4T, ddI, AZT, TDF**
  - NNRTI's (Non-Nucleoside Reverse Transcriptase Inhibitors): Nevirapine (NVP), Efavirenz.**
  - PI's (Protease Inhibitors): Ritonavir, Lopinavir, Indinavir and Nelfinavir.**
- The best available treatment combines 3 or 4 drugs (usually 2 NRTI's and either an NNRTI or a PI).
  - Such therapy requires close follow-up because of possible side-effects.
  - In Thailand a fixed combination of drugs in 1 tablet is commonly used in cases presumably not infected with drug resistant strain: **GPO-vir (Z)**. This tablet contains 3TC, AZT and NVP, and is taken BID. GPO-vir (Z) is used as first line treatment for HIV-AIDS in Thailand.

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Therapy is life-long as these drugs do not cure HIV.  
If the drugs are stopped the virus begins to multiply again. It is important to tell the patient this.

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Regular follow-up is essential to monitor whether the drugs are taken, the clinical response and the side effects.

### VACCINE

At this moment there is no HIV vaccine available.

## 16.3 COMMON HIV-RELATED ILLNESSES AND OPPORTUNISTIC INFECTIONS

### 1. CHRONIC DIARRHOEA (see p.83)

#### 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**). Make sure the patient is receiving supplementary feeding, and stress the importance of hygiene (hand washing, drinking only boiled water and thoroughly cooking meat and vegetables).

Try to find the cause by stool examination and give specific treatment. If no cause is found:

- 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).
- Non-bloody diarrhoea: If you suspect worms give **mebendazole** or **albendazole**. Diarrhoea without blood does not need antibiotics in most cases. In HIV patients you can consider treating with **cotrimoxazole** for 5 days and/or **metronidazole** for 10 days. If no response after treatment refer to a doctor.

### 2. PROLONGED FEVER

#### SIGNS and SYMPTOMS

Fever >37.5°C (lasting > 2 weeks) with no or minimal other symptoms.

Rule out malaria, bacterial infections (e.g. pneumonia, UTI, pyomyositis, bacteraemia), TB or atypical mycobacteria, viral infections (e.g. URTI, Cytomegalovirus (CMV), Epstein-Barr virus (EBV)) or malignancies such as lymphoma.

#### TREATMENT

If you find no cause of the fever (Fever DK = fever don't know), treat with **amoxicillin** or **cotrimoxazole** for seven days. Refer for full investigation if no improvement or condition is worsening.

### 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:

#### a) Bacterial Pneumonia

SIGNS AND SYMPTOMS: Quick onset, high fever, cough with sputum (may be purulent).

DIAGNOSIS: Clinical diagnosis, CXR if indicated.

TREATMENT: Treat as bacterial pneumonia see p.203. If signs of severity: admit to IPD and treat as severe pneumonia.

#### b) 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 (sulphamethoxazole/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 (usually indicated by hypoxaemia (low oxygen saturations) ADD:**

<b>Prednisolone (PO):</b> (if severe use IV hydrocortisone initially)	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

#### c) 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 (see p.216)

**Note:** In patients who are HIV positive AFB sputum test is often negative even in pulmonary TB

TREATMENT: Same drugs, protocols, duration and side effects as for treatment of other TB patients (see TB p.218).

**Note:** All HIV positive patients diagnosed with TB should start **cotrimoxazole** prophylaxis (does not matter what the CD4 count is).

### 4. ORAL CANDIDIASIS (THRUSH) See p.226

#### SIGNS AND SYMPTOMS

White patches or spots on tongue, palate, cheek or gums that can be removed manually. May have burning sensation in the mouth on eating.

#### TREATMENT

**Gentian Violet:** local application after each meal x 7 days  
**OR**

**Nystatin** Give 1 lozenge 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). Oral suspension should be swilled around mouth and then swallowed.

If no improvement:

<b>Fluconazole (PO):</b>	Adult:	200mg OD x 7 days
	Child:	3mg/kg OD up to 21 days

## 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

<b>Fluconazole (PO)</b>	Adult:	200 - 400mg OD x 14-21 days
	Child:	3mg/kg OD x 21 days

## 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. Send CSF or blood for Cryptococcal Antigen. If laboratory diagnosis is not possible, refer.

### TREATMENT

<b>Stage 1:</b> Initiation Phase	<b>Amphotericin B (IV)</b>	Child & Adult: 1mg/kg OD x 2 weeks
	<b>AND</b>	
	<b>Fluconazole (PO)</b>	Child: 12mg/kg OD (max 1200mg/d) x 2 weeks Adult: 800mg OD x 2 weeks
<b>Stage 2:</b> Consolidation Phase	<b>Fluconazole (PO)</b>	Child: 12mg/kg OD (max 800mg/d) x 8 weeks Adult: 800mg OD x 8 weeks
<b>Stage 3:</b> Secondary Prophylaxis	Give secondary prophylaxis after recovery:	
	<b>Fluconazole (PO)</b>	Child: 6mg/kg OD (max 200mg/d) <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
		Adult: 200mg OD
		Stop when on ART for at least 1 year and CD4 count >200cells/mm <sup>3</sup> 2 separate times 6 months apart

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**Note:** only start ART treatment 4 weeks after starting antifungal treatment

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## 7. CEREBRAL TOXOPLASMOSIS

### SIGNS AND SYMPTOMS

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<sup>3</sup>.

### 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 CT scan you can find 'ring enhancing' lesions in the brain. Unfortunately this is only available at a hospital.

**TREATMENT**

If suspect toxoplasmosis because of symptoms you can give treatment 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/d divided in 2 doses x 6weeks

**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

**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. Generalised papular skin lesions (typically with central dimples) in disseminated (severe) disease. Disseminated disease can be rapidly fatal.

**DIAGNOSIS**

Blood or skin lesions for fungal culture.

**TREATMENT**

**Stage 1:** Amphotericin B (IV) Adult & Child: 0.7mg/kg/day IV x 2 weeks  
Initiation Phase

**Stage 2:** Itraconazole (PO) Child: 5mg/kg BID x 10 weeks  
Consolidation Phase

Adult: 200mg BD x 10 weeks

**Stage 3:** Give secondary prophylaxis after recovery:

Secondary Prophylaxis Itraconazole (PO) Child: 5mg/kg OD (max 200mg OD)

<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

Adult: 200mg OD

Stop when on ART for at least 1 year and CD4 count >200cells/mm<sup>3</sup> 2 separate times 6 months apart

**16.4 PROPHYLAXIS (PREVENTION) OF OPPORTUNISTIC INFECTIONS**

Each infection makes the PLWH weaker, causing a further decrease of the CD4 count. This lowers immunity and makes 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.

**1. Cotrimoxazole prophylaxis**

This mainly prevents from *Pneumocystis Carinii* Pneumonia (PCP) and toxoplasmosis. It is also effective against certain types of bacterial pneumonia and intestinal infections.

**Who to 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<sup>3</sup> OR
    - WHO Clinical Stage 2, 3 or 4 (see *HIV stages*, p.120).
  - HIV infected persons diagnosed with tuberculosis.
  - Patients with previous PCP or previously treated toxoplasmosis (=secondary prophylaxis)
- (**Note:** if they have signs of active pneumonia, they should receive treatment dose. (see *treatment of opportunistic infections above*)).

**Dose:** (primary prophylaxis and secondary prophylaxis is the same dose):

#### Cotrimoxazole (PO)

Adult:	2 single strength tablets (=960mg) OD (*1 single strength tablet = 480mg = TMP 80mg + SMX 400 mg)	
Child:	<b>Syrup (200/40 mg per 5 ml)</b>	<b>Tablet 400/80</b>
<5kg	2.5ml	-
5-15kg	5ml	½ tablet
15-30kg	10ml	1 tablet
>30kg	-	2 tablets

**Note:** In case of allergy to cotrimoxazole, use Dapsone Adult: 100mg OD; Child: 2mg/kg OD (max 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:

<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 <sup>3</sup> 2 separate times 6 months apart

**Note:** If ART not available prophylaxis is life-long

#### Children born to HIV infected mothers:

ALL children born to HIV-infected mothers should receive cotrimoxazole starting at 6 weeks (see dose above).

- If the child is unable to tolerate cotrimoxazole, use dapsone 2mg/kg OD. G6PD deficiency needs to be excluded first. If the child is deficient in G6PD discuss with a doctor.
- Prophylaxis with cotrimoxazole can be stopped if the child is confirmed HIV negative 6 weeks after stopping breastfeeding.

## 2. Fluconazole Prophylaxis

Fluconazole prophylaxis is used only as a **secondary prophylaxis** if the patient has already had cryptococcal meningitis.

#### Who to give fluconazole to:

Patient had proven cryptococcal disease and recovered; prophylaxis given after 10-12 weeks of treatment.

#### Dose:

<b>Fluconazole</b>	Adult:	200mg OD
	Child 2-5yrs:	6mg/kg OD (max 200mg)

#### When to stop:

<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 <sup>3</sup> 2 separate times 6 months apart

## 16.5 PMTCT AND HIV IN PREGNANCY

**DEFINITION** PMTCT = Prevention of Mother to Child Transmission.

When a pregnant woman is HIV positive, she has a high chance (15 to 45%) of passing the infection to her baby. This is called vertical transmission. The virus can reach the baby in several ways:

- Before delivery, while the baby is still in the uterus.
- During delivery, when the baby is exposed to infected blood and fluids from the mother.
- After delivery, when the baby is breastfed, because the virus is also in the breast milk.

The goals of the **PMTCT program** are to prevent HIV transmission from HIV-positive women to their infants.

There are three main ways of doing this:

1. Providing ART during pregnancy.
2. Avoidance of invasive procedures during labour and delivery.
3. Counselling women on their infant feeding options.

Besides medical support, the pregnant woman with HIV need special care. Her first response to the diagnosis of HIV may include shock, depression and anxiety. She is worried about what will happen to her own health, her pregnancy, her child's health, or family relationships. She needs psychological and social care. She will need education and a lot of explanation about living with HIV. She also needs extra food supplies.

This support should be given by specially trained health workers (a PMTCT team) who are experienced in taking care of pregnant women with HIV.

### 1. Using ART during pregnancy

HIV transmission from mother to the infant may be reduced by giving ART during pregnancy and after delivery. Many different protocols exist; the most common use two or three of zidovudine, and/or lamivudine and/or nevirapine/ efavirenz in various combinations during pregnancy and labour, and after delivery to the mother and the newborn.

Some pregnant women may also need treatment with ART for their own HIV infection depending on their clinical state and CD4 count. This will also reduce the risk of HIV transmission to the infant.

Refer to the ART protocols in your clinic for further information on drugs, dosages and potential side effects.

### 2. Avoidance of invasive procedures such as artificial rupture of the membranes and episiotomy

During delivery, it is important to expose the baby as little as possible to blood and fluids of the mother by the following:

- Do not artificially rupture the membranes. It is important to wait until the membranes rupture spontaneously. Prolonged ruptured membranes increase the risk of transmission.
- Avoid using instruments that can damage the skin of the baby, such as a vacuum pump or forceps (unless there is fetal distress).
- Avoid episiotomy unless there is a very good reason to do one.
- When the baby is born, the baby should be washed carefully to get blood off the skin.
- In order to protect herself the midwife should always wear gloves, a protective apron and glasses during delivery.

### 3. About infant feeding

#### Exclusive Breastfeeding (recommended)

Breastfed infants have a reduced risk of infections such as diarrhoea and pneumonia due to the immune protection provided by breast milk and not being exposed to substitute milk (e.g. bottle feeding with infant formula milk) which are often contaminated. Despite provision of free formula and the availability of clean water, the risks were shown in developing countries. Therefore **WHO has recommended exclusive breast feeding is a preferred option, even in HIV positive mothers.**

**If a woman chooses to breastfeed she should be advised about the following:**

- Exclusive breastfeeding i.e. ONLY breast milk and NO additional liquids or solids, even water, for six months and then rapid weaning.
- Breast care: early treatment for mastitis, avoidance of cracked nipples.
- Early treatment for oral candidiasis in the infant.



**Exclusive formula feeding (not recommended)**

Even if not recommended, mothers who use formula should be informed and equipped to ensure its safe preparation and use. A risk in using formula comes from inappropriate preparation and unsafe feeding. Formula distribution and use should be carefully supervised at every step and accompanied by:

- A demonstration of how to prepare and feed formula safely using an open cup.
- Provision of a suitable cooking pot to prepare formula, and an open feeding cup.
- Adequate amounts of clean water and cooking fuel for frequent preparation.
- A warning about the health hazards of inappropriate preparation and unsafe feeding.

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It is important that the mother uses **exclusive (only)** formula feeding, not giving the breast now and then. She must understand that occasional breastfeeding will increase the risk of transmission.

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**4. Follow up of pregnant women and babies****Pregnant women:**

- Routine ANC follow up.
- Special attention should be given at each visit to drug side effects, fever, diarrhoea or cough.
- Examination should include checking weight, checking for oral thrush, listening to the chest, looking for enlarged lymph nodes, and looking for rash.
- Routine FS and FA anaemia prophylaxis and monthly Hb check.
- If supplementary feeding is available for HIV positive pregnant women this should be given at each visit.
- Delivery should take place in the clinic.

**Babies:**

- **Cotrimoxazole** as PCP prophylaxis from 6 weeks of age until 6 weeks after when there is no risk of HIV transmission (e.g. 6 weeks after stopping breast feeding)
- **Children born to HIV-infected mothers should receive the same immunisations as other children.**
- **Note:** BCG is recommended at birth to all children born of HIV-infected mothers. However, BCG should NOT be given to children who have clinical evidence of HIV infection or proven HIV infection.
- HIV testing:
  - 12 and 18 months
  - OR at least 6 weeks after not breast-feeding
  - OR anytime symptoms are present.



## 17

## CHAPTER 17: INFECTIOUS DISEASES

## 17.1 GENERAL DEFINITIONS

<b>Virus:</b>	<ul style="list-style-type: none"> <li>• A very small and simple infection particle.</li> <li>• They replicate (copy themselves) inside the cells of other organisms e.g. humans.</li> <li>• Examples: HIV, hepatitis B virus, measles.</li> <li>• Antibiotics DO NOT work against viruses, some anti-viral drugs exist (e.g. acyclovir against herpes virus) but these anti-viral drugs are expensive and often don't work very well as viruses are able to change easily so that they are not killed.</li> </ul>
<b>Bacteria:</b>	<ul style="list-style-type: none"> <li>• A complex infection particle that come in a range of sizes and shapes e.g. rods (e.g. diphtheria), spheres also known as cocci (e.g. streptococcus pneumoniae) and spirals (e.g. leptospirosis).</li> <li>• Antibiotics work against bacteria but changes in the bacteria are causing resistance to drugs.</li> </ul>
<b>Fungus:</b>	<ul style="list-style-type: none"> <li>• Includes yeasts (e.g. candida), mould (e.g. that grows on food that has not been eaten for too long) and mushrooms.</li> <li>• Some antifungal drugs exist e.g. fluconazole, nystatin.</li> </ul>
<b>Protozoa:</b>	<ul style="list-style-type: none"> <li>• Organisms made up of one cell.</li> <li>• Examples: malaria, amoeba, giardia, trichomoniasis</li> </ul>
<b>Pathogenic:</b>	<ul style="list-style-type: none"> <li>• Pathogenic organisms are organisms that cause disease.</li> </ul>
<b>Non-pathogenic organism:</b>	<ul style="list-style-type: none"> <li>• 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 live there normally and these are called non-pathogenic. These organisms do not cause disease.</li> </ul>
<b>Immune system:</b>	<ul style="list-style-type: none"> <li>• The process in the body that occurs to fight infection. It does this by increasing the number of white blood cells (WBC).</li> <li>• WBC have lots of functions including producing antibodies (see below) and toxins to fight the infection.</li> <li>• In some conditions e.g. HIV, diabetes, malnutrition, cancer, the immune system does not work very well (this is known as being <b>immunocompromised</b>). These people are more at risk of getting infections.</li> </ul>
<b>Antigen:</b>	<ul style="list-style-type: none"> <li>• Anything that causes the body to make an immune response (i.e. produce antibodies against).</li> </ul>
<b>Antibody (also known as immunoglobulin):</b>	<ul style="list-style-type: none"> <li>• The body makes these as part of the immune response to fight against a virus or bacteria.</li> <li>• IgM (immunoglobulin M) antibodies are produced quickly after an infection.</li> <li>• IgG (immunoglobulin G) antibodies are made later, and may be found in the blood for a long time.</li> </ul>
<b>Immunity:</b>	<ul style="list-style-type: none"> <li>• To have immunity means that the body has previously been infected or immunised so that if the body becomes infected again the body can fight the infection without causing any symptoms/disease.</li> </ul>
<b>Infectious:</b>	<ul style="list-style-type: none"> <li>• Means that it is possible for the infection in a person to be transmitted to someone else e.g. HIV.</li> </ul>
<b>Vaccination (also known as immunization):</b>	<ul style="list-style-type: none"> <li>• When you inject a small amount of antigen into the body that is small enough so that the body produces an immune response (i.e. produces antibodies) but not big enough to cause an infection. The antibodies mean that in the future the body can fight against the same infection without causing any symptoms and the person will not become ill.</li> </ul>
<b>Immunoglobulin:</b>	<ul style="list-style-type: none"> <li>• Sometimes it is possible to give people already made antibodies (immunoglobulins) when they have been exposed to an infection e.g. rabies immunoglobulin.</li> <li>• Because these antibodies are not made in the body sometimes the body can fight against them which is why they are only used for special cases when there is a high risk of infection.</li> </ul>

## 17.2 BACTERIAL DISEASES

### BACTERIAL MENINGITIS

URGENT REPORT  
SEE APPENDIX

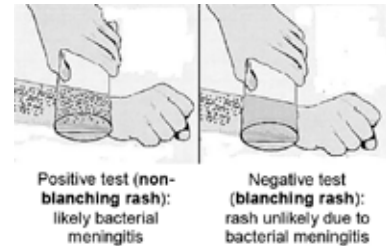
#### DEFINITION

Bacterial meningitis is a bacterial infection (mostly *Streptococcus pneumoniae*, *Neisseria meningitidis* or *Haemophilus influenzae*) of the membranes covering the brain (meninges). The bacteria are transmitted from person to person through droplets or throat secretions. For other causes of meningitis see *viral meningo-encephalitis* (p.140), *TB-meningitis* (p.218), *Cryptococcal Meningitis* (p.124).

#### SIGNS AND SYMPTOMS

##### Children < 1 year (see paediatric guidelines)

- Fever (38.5°C or more), unwell, drowsy, not sucking well, vomiting, convulsions, coma
- Crying a lot or lying very 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\*\***

In **TB meningitis** the fever is not very high, and can be sporadic. Suspect TB meningitis in young patients with neurological signs (e.g. hemiplegia, paraplegia). Usually these have a gradual onset. Often the patient will show changes in their behaviour.

**Cryptococcal meningitis** is more common in patients who are immunocompromised (e.g. HIV/AIDS) and is also of slow onset. Temperature can be normal or only slightly elevated, and there is a severe persistent headache (see *treatment in HIV/AIDS section p.124*).

#### DIAGNOSIS

Clinical presentation and lumbar puncture (LP) If possible and no contraindications (see below).

- Lumbar puncture (see table below for interpretation):  
When you do a lumbar puncture you should:
  - Check the appearance of the cerebrospinal fluid (CSF)
  - **The most important thing is to send the CSF for culture to see if any organism can be found**
 If possible also check:
  - Microscopy for WBC +/- gram stain, Ziehl Neelsen stain, India ink stain
  - Glucose (also check blood dextrose at a similar time to doing the LP as need to compare the CSF and blood glucose)
  - Total protein
  - Test the opening pressure (if have a manometer)
- Always carry out a malaria smear. Malaria and meningitis can occur together

**Do NOT perform a lumbar puncture if there are signs of raised intracranial pressure or risk of bleeding:**

- Unequal pupil size
- Non-reactive pupils
- Very slow heart rate (<50 in adults)
- Irregular breathing
- Severe respiratory distress
- Low platelets or a bleeding disorder
- GCS <15
- Seizure
- Focal Neurological sign

**How to interpret CSF result:**

Cause	Normal CSF	Bacterial	Viral	TB	Cryptococcal
<b>Appearance</b>	Clear	Cloudy	Clear	Slightly cloudy	Slightly cloudy
<b>WBC</b>	<5/mm <sup>3</sup>	>200/mm <sup>3</sup> Mostly neutrophils (May be <100mm <sup>3</sup> in early cases)	>10mm <sup>3</sup> Early infection neutrophils Late infection more lymphocytes	>10/mm <sup>3</sup> Mostly lymphocytes	>10/mm <sup>3</sup> (may not be raised in HIV/AIDS cases) Mostly lymphocytes
<b>Glucose</b>	> $\frac{2}{3}$ blood dextrose	Low	Normal	Low	Low
<b>Total protein</b>	0.15-0.4 g/L	High	High	High	High
<b>Microscopy</b>	None	Pus Gram stain positive	None	AFB in ZN stain (but rare)	Positive in India Ink
<b>Opening pressure</b>	20-60 drops/min	High	Usually normal	Variable	Variable

**Do not delay starting antibiotics waiting to do a lumbar puncture.****This could lead to the death of the patient.**

If you cannot perform a lumbar puncture but you are concerned about meningitis: start antibiotics

**TREATMENT**

- Admit to IPD.
- Give Antibiotics:
  - If no skin infection: **ceftriaxone** 2g BID
  - If associated skin infection: Adult: **ceftriaxone** 2g BID **AND** **cloxacillin** 8-12g per day (e.g. 3g QID)
- **Dexamethasone:**
  - Child >2m and Adults: IV 0.15mg/kg QID (max 10mg) for 2 days (first dose before or together with first antibiotic dose)
  - Dexamethasone improves the outcome in adults and children. (Reduces risk of hearing loss in meningitis caused by the bacteria *Haemophilus influenzae* or *Streptococcus pneumoniae* – administer early in these pathogens or when pathogen is not known except in neonates).
- Give supportive treatment: fluids and oxygen.
- Treat the fever with **paracetamol**.
- Treat the convulsions with **diazepam**.
- Give special nursing care if the patient is in a coma (see Coma section p.17).

**PREVENTION**

Preventive vaccination can be used to protect individuals at risk (for example, people without a spleen).

Those in close contact with a patient (family/household) should be given immediate prophylaxis to prevent them from contracting the illness (**ciprofloxacin** PO STAT Adults: 500mg; Child: 15mg/kg).**VACCINATION**

Several vaccines have been proven to be safe and effective with infrequent and mild side effects. In our region there is no routine vaccination for meningitis.

## LEPTOSPIROSIS

SURVEILLANCE  
DEPENDENT ON  
NUMBERS  
See appendix

### DEFINITION

Leptospirosis is caused by a spiral bacteria (spirochetes) called *Leptospira*. These bacteria live in animals (especially rats, but also dogs, cats and cattle) and are excreted in their urine. Once excreted, they can remain alive in the soil for months. *Leptospira* can enter the human body through damaged skin, mucous membranes and conjunctivae following contact with contaminated water (e.g. by animal urine) or through 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.
- Conjunctival suffusion (eyes are red, no pus).
- Severe muscle pain (particularly calves) and tenderness.
- Headache.

**May have other symptoms:** abdominal pain, nausea and vomiting, diarrhoea, cough and pharyngitis, chest pain, arthralgia (joint pain).

This phase lasts 5-9 days and can be very mild or very severe. In many patients the disease stops here. However, sometimes 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 also without liver and kidney failure. Patient coughs up blood (haemoptysis) and often chest examination is normal (no crackles).
4. **Uveitis** (very red eye, blurred vision, eye pain, irregular pupil, photophobia, headache).
5. **Liver failure** usually gets better, but **kidney failure** and **respiratory distress syndrome** have poor prognosis.

### DIAGNOSIS

Clinical, but some investigations could be helpful:

- Dipstick: protein and blood in urine.
- Lab (if available): raised CK 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**
    - IV **ampicillin** Adults: 2g TID Child: 100mg/kg/day in 3 divided doses
    - Then switch to PO **amoxicillin** when improving e.g. 48 hours after fever stops (total 7 days of antibiotics)

### PREVENTION

Collection of rubbish to reduce rat population, education 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.

## SCRUB TYPHUS

### 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 'Fever Don't Know' (Fever DK) in the tropics.** Left untreated many people recover, but some will die.

### SIGNS AND SYMPTOMS

- Fever
- Severe headache
- Red eyes (conjunctival injection)
- Enlarged, painful lymph nodes (adenopathy) first near the site of the bite, then generalised.
- Skin lesion at the site of the infecting mite's bite: small, round, hard red papule becoming bigger with a dead (necrotic) centre, covered by a black hard surface (**eschar**). Look for it especially on the patients' back, 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/encephalitis.
- Rarely atypical bronchitis, enlarged spleen, inflamed heart (myocarditis), strange behaviour (neuropsychological 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.

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### 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

- Treat the fever and the pain.
- Antibiotic.

(a) First choice:

<b>Doxycycline</b>	Child >8yrs and Adult:	200mg OD (OR 100mg BID) x 7 days
<b>Azithromycin</b>	Pregnant:	500mg PO STAT
	Child 6mths - 8yrs:	20mg/kg PO STAT

---

**Note:** Cotrimoxazole, erythromycin, gentamicin and amoxicillin are NOT EFFECTIVE in scrub typhus. If the fever does not go down within 48 hours after starting treatment: the patient very likely does not have scrub typhus: think of other diagnoses (dengue, leptospirosis, typhoid fever, etc.)

---

### PREVENTION

Reduction of vector populations and personal hygiene improvement (including de-lousing) are most important. Advise people to avoid mite-infested areas, use thick repellents and protective clothing. Patients should wash themselves and disinfect their clothes by washing in hot water or impregnate with 1% permethrin.

Advise **doxycycline** prophylaxis (200mg weekly) for those working in high-risk areas.

Regular preventive treatment of medical/nursing staff is recommended in endemic areas.

### VACCINATION

There is no vaccine available.

### **Murine Typhus:**

On the Thailand-Myanmar border another form of typhus is common: **Murine Typhus** (or endemic typhus). This is an acute infectious disease with fever, headache, and rash; all quite similar to, but milder, than scrub typhus. Murine typhus is caused by a related micro-organism (*rickettsia typhi*), and is transmitted to humans by rat fleas. The animal carriers include rats, mice and other rodents. Treatment is the same as for scrub typhus.

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**TETANUS**SURVEILLANCE  
See appendix**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 wound contamination, and often involves a cut or deep puncture wound. As the infection progresses, muscle spasms in the jaw develop, hence the common name: 'lockjaw'. This is followed by 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 that occurs 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)
- Difficulty swallowing
- Generalised muscle spasms.

**DIAGNOSIS**

There are no laboratory findings characteristic of tetanus. The diagnosis is entirely clinical and does not depend upon bacteriologic confirmation.

**TREATMENT**

Refer patient to hospital.

If unable to go to hospital:

- Maintain an open airway
- All wounds should be cleaned. Necrotic tissue and foreign material should be removed (see p.234).
- **Metronidazole** IV 500mg TID for 7 days.
- **Diazepam** IV for spasms
- **Paracetamol** IM/IV for pain

**PREVENTION & VACCINATION** (see wounds p.234)

RISK	PATIENT VACCINATION COMPLETE			PATIENT VACCINATION NOT COMPLETE
	Last booster was:			(< 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  
Consider adding **ciprofloxacin** Adult: 500mg BID; Child 15mg/kg BID (max 500mg BID) for 5-7 days if the wound was exposed to soil (e.g. wounds on the feet, wound caused by wood or bamboo), or if there is no improvement with cloxacillin.

Booster: **Tetanus toxoid vaccine** 0.5ml IM into upper arm or buttock

Serotherapy: Adults and children: **Tetanus 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 the vaccine and the immunoglobulin in two different sites using separate syringes for each.



## TYPHOID FEVER

**SURVEILLANCE  
DEPENDENT ON  
NUMBERS  
See appendix**

### DEFINITION

Typhoid fever is a bacterial infection caused by *Salmonella typhi*. It is transmitted by contaminated food, water or dirty hands. The time between exposure with the bacteria and symptoms is 10 - 15 days.

### SIGNS AND SYMPTOMS

**Typhoid is suspected in a patient with:**

- Prolonged fever  $\geq 38^{\circ}\text{C}$  for more than 7 days.
- Negative malaria smear, 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 that can be present:** tiredness, headache, dry cough, patient does not want to eat (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 seems to be cured:

- 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 typhi*. Unfortunately it is not a test available at all clinics on the border.

May also get relative leukopenia (normal WCC despite septicaemia).

### TREATMENT

- Admit to IPD: give fluids: **ORS** or IV fluids (**NSS** or **RL**)
- Treat the fever with **paracetamol**.
- Antibiotics:

#### 1st choice:

<b>Ciprofloxacin PO:</b>	Adult	500mg BID x 5-7days
	Child	15mg/kg BID x 5-7days

#### For severe cases/ those who cannot swallow:

<b>Ceftriaxone IV:</b>	Adult	1g OD x 7 days
	Child	50mg/kg OD x 7 days

Switch to PO **ciprofloxacin** when condition improving and can take oral antibiotics (total 7 days of antibiotics)

**Note:** Resistance of *Salmonella typhi* to ciprofloxacin has been described in our area. In case of suspected resistance (poor response to ciprofloxacin treatment) continue treatment for 10-14 days or switch to azithromycin or ceftriaxone).

- If signs of peritonitis (hard abdomen, severe pain, altered bowel sounds): REFER (see p.77).
- For severe presentations (shock, coma): **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. However, if the fever is still high at day 7, re-think diagnosis or suspect resistance to antibiotics.**

### PREVENTION

This disease is contagious. Clean water and clean food are important for prevention. Advise the family and the neighbours to use latrines and to wash their hands after passing stools and before eating. If you notice an increased number of cases, inform the doctor and prevent spreading of the disease in order to avoid an epidemic.

### VACCINATION

There is a live oral vaccine available, but in our region there is no routine vaccination for typhoid fever.

## MELIOIDOSIS

### 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, renal disease, liver disease, chronic lung disease, thalassaemia, immunocompromised person (e.g. HIV) and agricultural workers 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 bacterial in the culture media.

### TREATMENT

- Admit to IPD: give fluids: **ORS** or IV fluids (**NSS**)
- Treat the fever with **paracetamol**.
- Antibiotics (doses for adults):

#### **Immediate Therapy:**

**Ceftazidime:** 2g (or 40mg/kg) TID for 2 weeks

**AND**

**Cotrimoxazole** (Trimethoprim+Sulphamethoxazole):  
10/50mg/kg (maximum 320/1600mg – 4 tablets of  
480mg of cotrimoxazole) BID for 2 weeks

#### **Continuation Therapy:**

**Cotrimoxazole** (Trimethoprim+Sulphamethoxazole):  
8/40mg/kg BID for 12-20 weeks

### PREVENTION

- Persons with open skin wounds and those with diabetes or chronic renal disease are at increased risk for melioidosis and should avoid contact with soil and standing water.
- Those who do agricultural work should wear boots, which can prevent infection through the feet and lower legs.
- Health care workers can use standard contact precautions (mask, gloves, and gown) to help prevent infection.

### VACCINATION

There is no vaccine available for melioidosis yet.

## 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, but especially in our area. Resistance occurs because health care providers prescribe too many antibiotics (e.g. for viral illnesses when they will not work) and patients do not complete full courses of antibiotics. Being able to buy antibiotics or Yaa Chud in pharmacies and shops without health care advice 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!

---

**A bacteria may be resistant to a specific antibiotic, or it may have a special pattern of resistance such as ESBL/ MRSA:**



**ESBL (EXTENDED SPECTRUM BETA LACTAMASE) PRODUCING BACTERIA**DEFINITION

Bacteria that produce ESBL are able to break down certain antibiotics that have a beta lactam ring therefore making them resistant. The 2 main bacteria that produce ESBL are *E.Coli* and *Klebsiella*. (Therefore ESBL UTIs are common.) The antibiotics most commonly affected are penicillins e.g. ampicillin, and cephalosporins e.g. ceftriaxone.

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 (that does not have a beta lactam ring) e.g. meropenem for 7-14 days.

**MRSA (METHICILLIN RESISTANT STAPH AUREUS)**DEFINITION

MRSA is a type of Staph Aureus bacteria that is resistant to penicillins. This means that it is resistant to cloxacillin which is normally used for Staph Aureus infections e.g. cellulitis. It is sometimes found on people's skin and does not cause any harm. However if someone is unwell/immunocompromised and they get MRSA in the blood they can become severely unwell.

TREATMENT

- Stronger very expensive antibiotics e.g. vancomycin are needed to treat MRSA.

---

TO STOP BACTERIA FROM BECOMING RESISTANT WE NEED TO:

1. Carefully prescribe antibiotics only to those that need them. **DO NOT** prescribe antibiotics if you suspect a viral infection.
  2. Educate patients not to buy antibiotics or Yaa Chud from the pharmacy/shop.
  3. Educate patients that they should complete the course of antibiotics that we prescribe even if they feel better.
- 

**17.3 PARASITIC DISEASES****LYMPHATIC FILARIASIS**DEFINITION

Lymphatic filariasis is a parasitic disease caused by thread-like worms. The clinical signs and symptoms are very variable due to differences in parasites, reaction of the body to the parasites and intensity of the infection. The disease spreads from person to person by mosquito bites (lymphatic filariasis). The parasites (worms) enter the body through the skin, are transported 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*.

SIGNS AND SYMPTOMS

- |   |   |
|---|---|
| • May be asymptomatic (no signs or symptoms).   | • Chronic infections lead to:   |
| • Fever with headache, lymphadenopathy, itchy skin (dermatitis), sometimes bacterial super infection. | • Lymph oedema of the legs.   |
| • Swollen lymph nodes mainly in the groin.  | • Ascites.  |
| • Arm, breast, leg or scrotal swelling due to lack of lymph drainage.                                 | • Glomerulonephritis with haematuria.   |
|   | • Chyluria (passing white urine: urine mixed with chyle (lymph fluid) from ruptured lymph vessels). |

COMPLICATIONS:

Due to extreme eosinophilia, severe pulmonary inflammation can develop: tropical pulmonary eosinophilia (see p.205). Patients present with dry cough (especially at night time), 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

**Acute Attacks:** bed rest, elevation of affected limb without bandaging, cooling of limb, analgesia, antibacterial/fungal

cream if necessary, paracetamol if fever, hydration.

**Note:** Do not give medication during acute attack

- **Doxycycline** 200mg OD for 6 weeks minimum - discuss with doctor if <8yrs or pregnant as contraindicated  
OR
- **Diethylcarbamazine (DEC)** (is available in Mae Sot Hospital) (be careful 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 no more effective.

**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 (see p.234).

#### PREVENTION

- Prevent mosquito bites: use mosquito nets and repellents.
- Seasonal mass treatment with diethylcarbamazine (DEC) and albendazole are recommended in areas where filariasis is common.
- Vector control.

#### VACCINE

A vaccine is not yet available and is unlikely to be developed in the near future.

## 17.4 VIRAL DISEASES

### DENGUE FEVER

**SURVEILLANCE  
DEPENDENT ON  
NUMBERS  
See appendix**

#### 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 clean water that is still especially in man-made containers both inside and outside the house for example 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 identified 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
- 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 e.g. 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 3<sup>rd</sup> or 4<sup>th</sup> day after the fever has decreased.

**\*\*Danger stage is day 3 to day 7\*\***

Other signs and symptoms that can be present:

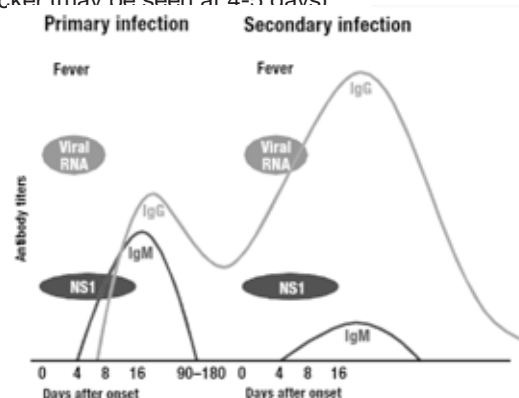
- Severe headache especially behind the eyes (common)
- Skin rash: diffuse redness on the neck, face and chest.
- Lymph node enlargement (lymphadenopathy).

**\*Tourniquet Test:** Inflate a blood pressure cuff on the upper arm to midway between systolic and diastolic blood pressure for 5 minutes. A positive test is when there are more than 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

- CBC may show low WBC, low platelets, high haematocrit in severe dengue (plasma leaks out so the blood is more concentrated with RBC).
- A drop in Hct suggests that there is some bleeding, this may be hidden e.g. in the abdomen.
- Dengue serology lab test. For definitions see p.129. How to interpret results:
  - **Dengue RDT NS-1:** a protein on the virus which means that the body is currently infected with the virus
  - **Dengue RDT IgM:** initial antibodies formed against the virus– the body develops IgM antibody 3-5 days after onset of infection, and can last up to 180 days
  - **Dengue RDT IgG:** long-term antibodies produced against the virus, may be present for many years after infection
  - **Note:** If second dengue infection, the IgG increases much quicker (may be seen at 4-5 days)

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 <b>Note:</b> may be false negative if the sample is taken too early: if strong suspicion consider repeating test in 1 week.



TREATMENT

**Note:** 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.

**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 - can make bleeding from platelet problem worse.**
- Hydration: start with **ORS**. If the patient is unable to drink, start an infusion of **NSS** (see chart below). See appendix for preparation of ORS.
- 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 Charts below.

**If you notice an increase number of cases, inform the doctor. A rapid response can avoid an epidemic.**

### PREVENTION

When considering prevention of dengue it is important to remember that the *Aedes* mosquito bites during the day, and that it likes to lay eggs in clean, still 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

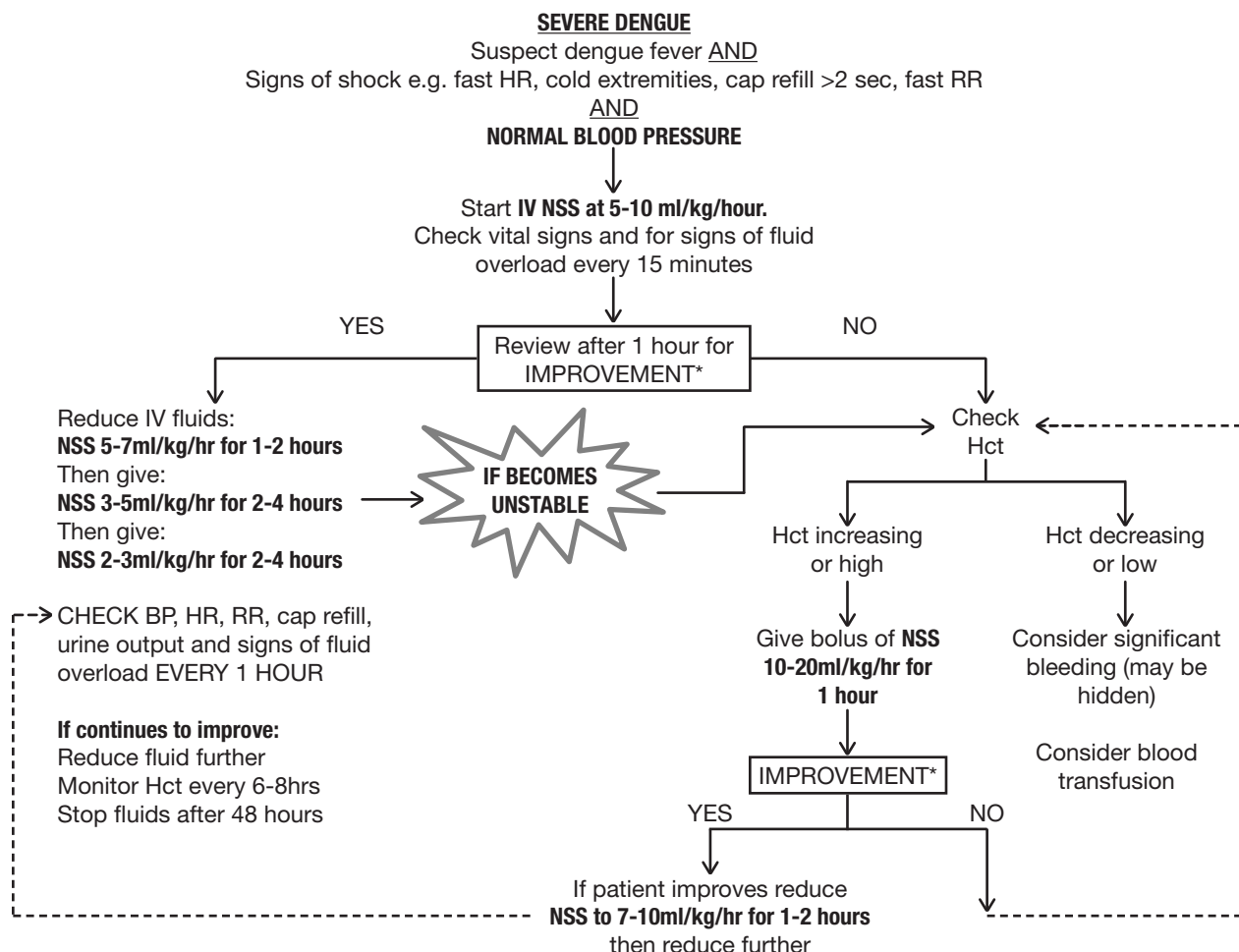
#### Protection for your community:

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.

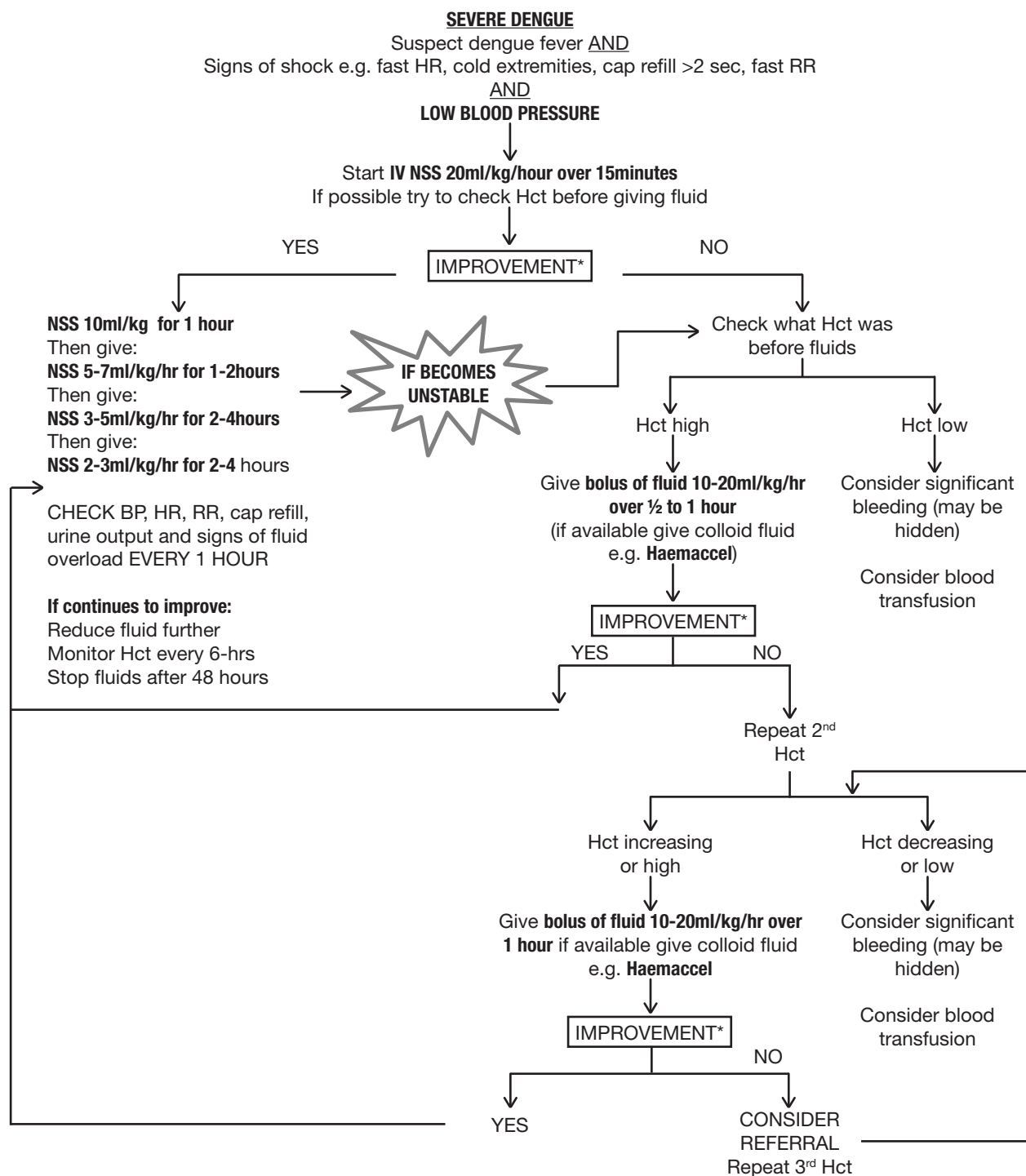
### VACCINATION

There is no vaccine available.

#### Algorithm 1: Treatment of Severe Dengue with NORMAL blood pressure:



\* IMPROVEMENT: To assess improvement check BP, HR, cap refill, urine output

**Algorithm 2: Treatment of Severe Dengue with LOW blood pressure:**

\* IMPROVEMENT: To assess improvement check BP, HR, cap refill, urine output

**ENCEPHALITIS**

**URGENT REPORT  
SEE APPENDIX**

**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.

There is one important form of encephalitis:

**Japanese encephalitis** is the most important and common encephalitis in South-East Asia including India and areas in the Southern Pacific. Transmission to humans is through the bite of a mosquito, which generally breeds in flooded rice fields. The disease is caused by a flavivirus, which spends most of its lifecycle in birds and pigs.

Every year there are around 30,000-50,000 cases, 30% of which will result in death. For those who survive, 30% will have serious neurological problems. After infection there is lifelong immunity.

**SIGNS AND SYMPTOMS**

The majority of infections do not cause any symptoms.

- Headache and fever might be the only symptoms for 1-6 days.
- Other signs can be:
  - Photophobia (fear of strong light)
  - Weakness
  - Neck stiffness
  - Convulsions.

The disease can progress to paralysis, seizures, coma and death.

Neurological problems after infection (sequelae): hemiparesis, deafness, mental retardation and emotional lability (changes in emotion that are not predictable).

**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:**

- |  |  |
|--|--|
| • Unequal pupil size                   | • Low platelets or a bleeding disorder |
| • Non-reactive pupils                  | • GCS <15                              |
| • Very slow heart rate (<50 in adults) | • Seizure                              |
| • Irregular breathing.                 | • Focal Neurological sign              |
| • Severe respiratory distress          |  |

---

If you cannot perform a lumbar puncture but you are concerned that this case could be encephalitis or meningitis start antibiotics for bacterial meningitis.

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**TREATMENT**

Antiviral treatment:

- If available treat with acyclovir – ideally 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

Symptomatic treatment:

- Pain relief (see p.27).
- For seizures (see p.19).
- See coma section for treatment of comatose patients (see p.17).
- Physiotherapy: massage, move the patients 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.130).

**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 up to date vaccination schedules.

**MEASLES**

URGENT REPORT  
SEE APPENDIX

**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 rise to 30% during epidemics, 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).

See photo p.129





## TREATMENT

### **Paralysis form:**

- Keep in IPD, bed rest.
- Treat the pain.
- Prevent sores.
- Physiotherapy to prevent wasting of muscles and stiffness.

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**Note:** Do NOT give any IM injections to a patient with suspected poliomyelitis.  
You will make the (paralysis) polio worse.

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## PREVENTION & VACCINATION

- Oral polio vaccine is available, see up to date vaccination schedules.
- Vaccinate all children under 5 years of age living in the same area of a suspected case even when they have been vaccinated before.
- Start a mass vaccination campaign if a case of poliomyelitis is confirmed by laboratory test.

## **RABIES**

### DEFINITION

Rabies is a fatal viral disease which infects domestic (e.g. dogs or cats) and wild animals (e.g. bats). It is transmitted to other animals and humans through close contact with saliva from infected animals (through bites, scratches, licks on broken skin, and mucous membranes). Once symptoms of the disease develop, both animals and humans will die from the disease. However, if the infection is treated soon after transmission and before the onset of clinical symptoms, rabies can be prevented by post exposure vaccination.

### SIGNS AND SYMPTOMS

Average time between exposure to rabies and symptoms is 1-3 months, but may even be a few years.

- Itching, pain or numbness at the site of the bite (starting 20-90 days after the bite – although 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.
- In both furious and paralytic rabies, partial paralysis progresses to complete paralysis followed by coma and death in all cases, usually due to respiratory failure. Without intensive care, death occurs during the first seven days of illness.

### DIAGNOSIS

Clinical. History of an animal bite or contact with broken skin, plus neurological features.

### TREATMENT

There is no effective 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 (see p.28) or diazepam). See palliative chapter p.192

Symptomatic disease can be prevented by:

#### **1. Local wound care.**

- Wash and flush a wound or point of contact:
  - For skin: use soap, lots of running water, 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, but if necessary, immunoglobulin must be applied first.
- Anti-tetanus treatment and antibiotics (see wound care p.234 and tetanus p.134) should be administered to control infections other than rabies

#### **2. Post exposure prophylaxis: (vaccine +/- anti-rabies immunoglobulin)**

**Note:** 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

#### Define the category of exposure (from WHO):

<b>Category I:</b> Touching, feeding of animals or licks on intact skin:	<b>no treatment if history reliable</b>
<b>Category II:</b> Minor scratches or abrasions without bleeding, or licks on broken skin and nibbling of uncovered skin:	<b>vaccine immediately (AND immunoglobulin if patient immunosuppressed)</b> stop if the dog remains healthy for 10 days
<b>Category III:</b> Single or multiple transdermal (through the whole skin) bites, scratches or contamination of mucous membrane with saliva (i.e. licks):	<b>immunoglobulin AND vaccine immediately</b> stop if the dog remains healthy for 10 days

- Anti-rabies vaccine should be given for Category II and III exposures as soon as possible.
- Anti-rabies immunoglobulin (antibody) should be given for all Category III exposures and for Category II exposures in immunosuppressed patients e.g. HIV, malnutrition. This immunoglobulin can be given within 7 days of potential exposure to the rabies virus.

Start of treatment should not be delayed by dog observation when rabies is suspected

#### Administration of 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.

#### Schedules for vaccines:

##### IF NO PREVIOUS FULL RABIES VACCINATION COURSE OR UNSURE:

- **Intramuscular regime:**  
Intramuscular vaccines should not be injected into the buttock region. Use the **shoulder muscles (deltoid)**.  
Day 0: One vaccine per arm (deltoid muscle of two arms)  
Day 7: One vaccine (deltoid muscle of one arm)  
Day 21: One vaccine (deltoid muscle of one arm)
- **Intradermal (ID) (into the skin) regime:**  
Intra dermal injections reduce the volume of vaccine required and vaccine cost by 60% to 80%.  
Day 0: 0.1ml per arm (two arms)  
Day 3: 0.1ml per arm (two arms)  
Day 7: 0.1ml per arm (two arms)  
Day 28: 0.1ml per arm (two arms)

##### IF HAS DEFINITELY COMPLETED RABIES VACCINATION COURSE:

- \* 1-site intramuscular or intradermal method
- Day 0: 1 dose ID or IM (one arm)  
Day 3: 1 dose ID or IM (one arm)

When the intradermal route is used, train the staff to give intradermal injections, provide proper conditions for vaccine storage and decide the duration of maximal vaccine storage after use. Make sure you have the 1 mL syringe and short hypodermic needles to give the intradermal vaccine.

#### 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

### PAROTITIS

#### DEFINITION

Swelling of the parotid gland (glands that produce saliva that are located below the mouth and in front of the ears). Can be caused by different organisms. Signs and symptoms, and treatment depends on the cause.

#### 1. **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

#### 2. **Mumps:**

##### CAUSE:

Viral

##### SIGNS AND SYMPTOMS:

Pain and swelling mostly on both sides of the neck lasts 5-9 days, malaise, anorexia, fever, orchitis (painful swelling of testicles), rash

##### TREATMENT:

Symptomatic for pain and fever, soft diet

##### PREVENTION:

Mumps vaccine (MMR)

**SURVEILLANCE**  
See appendix

#### 3. **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 p.216

#### 4. **HIV Parotitis:**

##### CAUSE:

HIV

##### SIGNS AND SYMPTOMS:

Non-painful swelling of gland, may have other HIV symptoms

##### TREATMENT:

Anti-retroviral therapy

#### 5. **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 autoimmune disease

##### TREATMENT:

Specific treatment for auto-immune disease

## 18

## CHAPTER 18: MENTAL HEALTH AND SUBSTANCE ABUSE

## 18.1 MENTAL HEALTH

Many psychiatric disorders do not have obvious signs and symptoms. Alcohol abuse, for example, may be a symptom of depression, anxiety or trauma (post traumatic stress disorder).

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 when a person is unable to deal with increasing levels of mental stress or tension and are seen in depression, bipolar, anxiety and PTSD, as well as psychosis. Because the patient is unable to deal with the mental consequences of high levels of stress, the body will develop a physical symptom such as headache, abdominal pain, numbness, dizziness, fainting or, in some cases, paralysis. Generally the patient is able to discuss physical aches and pains more openly than their underlying psychological stress and the causes for it. However, it will not be possible to fix the physical symptom unless the underlying stress is managed.

Many mental health problems should not be treated with medication alone. **Drugs should be combined with counselling**. In Section 18.1.6 you can find more information about 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

DEFINITION

There are two types of mood disorders:

**Depressive disorder**

**Bipolar disorder (manic depressive disorder)**

DIAGNOSIS

A **depressive disorder** is characterised by one or more depressive episodes. There are no manic episodes.

A **bipolar disorder** is characterised by at least one manic episode and one or more depressive episodes.

**In a depressive episode a patient will have five or more of the following symptoms, including at least one of the bold symptoms:**

- **A depressive mood (feelings of sadness) most of the time.**
- **Less interest or pleasure in normal activities most of the time.**
- Loss of sleep (insomnia).
- Weight loss or loss of appetite.
- Fatigue or lack of energy.
- Feelings of guilt or incompetence.
- Loss of concentration.
- Suicidal thoughts or activities.

These symptoms must be present for **at least two weeks** before a diagnosis of depression should be made.

A depressive episode is also characterised by a **low level of psychomotor activity**: the patient may have a sad facial expression, a lack of humour, be silent or reluctant to speak, or want to be alone.

**A manic episode is characterised by three or more of the following symptoms:**

- 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.

These symptoms must be present for **at least one week** before diagnosing a manic episode.

Try to find a trigger event e.g. bereavement, rape, accident, disease diagnosis e.g. HIV.

## TREATMENT

### Non-medication treatment options:

- Counselling (see below section p.151).
- Encourage the patient to keep active, get up at regular times and do plenty of physical exercise.

### Treatment by medication:

#### Depressive disorder

##### 1<sup>st</sup> Line: Selective Serotonin Reuptake Inhibitor (SSRI):

- e.g. **Fluoxetine** (1 tablet = 20mg) normal dose 40 - 60mg OD OR  
**Sertraline** (1 tablet = 50mg), normal dose is 100 - 200mg OD.
- Start at 1 tablet/day and wait least 1 week before increasing these medicines. This treatment 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 section 1.7 for suicidality.

##### 2<sup>nd</sup> Line: Tricyclic antidepressant (TCA) (Use if you do not have an SSRI, or if the SSRI is not effective after 8 weeks)

- e.g. **Amitriptyline** normal dose is between 75 - 150mg OD at night
- **Side effects:** Sedation, urinary retention, blurred vision, tachycardia, orthostatic hypotension (drop in BP when stand up), agitation, confusion, dangerous in deliberate overdose
  - **\*\*Note: do not give large amounts of TCAs to a patient undergoing unsupervised treatment. Taking an overdose of this medicine can be fatal.\*\***
  - After starting treatment the patient should be followed up weekly (maximum every 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** – if stopping: slowly decrease dose of medications over 1-4 weeks.
  - If the above medications are not effective, refer the patient to a hospital where mental health care is provided.

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**Women can be particularly at risk for depression in the first few months postpartum – sometimes so severe they become psychotic, commit suicide or kill their infant. In these cases the mother's safety and the baby's safety should be carefully considered: use all counselling, family support and medications necessary.**

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#### Bipolar disorder

- Bipolar disorder is difficult to control and these patients are at higher risk for suicide. It is best for these patients to be managed by psychiatric specialists, and acute mania may require hospitalization.
- If that is not possible, patients with a manic episode can be treated with **carbamazepine** 200mg BID and increase as needed, max 1200mg/day. This can be continued to prevent future manic episodes.
- For severe episodes with agitation, patients can be treated as acute psychosis (see p.150).
- For a patient with a history of both severe depression and mania, carbamazepine can be given together with an SSRI.
- Carbamazepine can affect the platelets, red blood cells, kidneys and liver, if possible check CBC, LFT and renal function every 3-6 months.

**\*\*Note:** if available, **lithium** is inexpensive and may be more effective. Start with 300mg, normal dose 600-900mg, check thyroid and kidney function every 3-6 months. It also has a small therapeutic window – check levels frequently for overdose.\*\*

## 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 usually starts beating faster, reactions are quicker and we are more alert. Headaches and sweating are common. This is the body's normal reaction to stress, but problems occur when levels of stress are too high or they are unable to be relieved.

- When these symptoms become 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.151).

### **Non-medication treatment options:**

- **Cognitive behavioural therapy.** This should be carried out by trained health workers. This form of therapy has a lot of similarities with counselling (see p.151).

### **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** (5-15mg 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.

**\*\*Note:** diazepam medicine is very addictive: only use it if the patient's anxiety cannot be controlled through counselling.\*\*

## 18.1.3 POST TRAUMATIC STRESS DISORDER

### DEFINITION

Post traumatic stress disorder (PTSD) is a condition that occurs as a response to severe and prolonged fear. It is characterized by continual high levels of anxiety that interfere significantly with the person's ability to lead their life. This disorder is common in people that have experienced violent situations, or have escaped from life-threatening situations, both of which are common experiences for refugees and migrants.

### CAUSES

1. Life threatening violence, either a single event or over a long period of time.
2. Violence experienced either directly by the patient or seen by the patient to have happened to somebody else.
3. Escaping from possible violence, or fear of capture.

### SIGNS AND SYMPTOMS

- **Persistent re-experiencing:** images, thoughts or perceptions about the traumatic experience which intrude despite efforts to block them out (the patient tries not to think about it but cannot). It may include distressing dreams and flashbacks (reliving the experience).
- **Avoidance:** patient avoids places, situations, people associated with the trauma, may use alcohol, drugs to help do this.
- **Increased arousal:** constant state of alert, exaggerated startle response (very easily scared), anxiety, insomnia, poor concentration, may have somatic symptoms e.g. high BP, sweating, shaking, tachycardia, headache etc.

## TREATMENT

### **Non-medication treatment options:**

- Counselling (see p.151).
- 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 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 5mg). However, 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**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. However, in delusions these 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

You may need to get a history from a family member, is this the first time this has happened?

It is important to distinguish medical causes of confusion e.g. infections in elderly, steroid induced psychosis, substance abuse, hypoglycaemia.

TREATMENT

- For acutely psychotic patients who are agitated or violent **haloperidol** 2.5-5mg PO or IM can be given. (Take care for your safety.)
- For severe anxiety or agitation can give short course of sedative treatment added to anti-psychotic treatment at the beginning of the course e.g. **diazepam** 5-15mg per day in 2-3 divided doses for a few days.
- Mild acute psychosis or chronic psychosis can be treated with **haloperidol** 2.5mg BID, if insufficient 5mg BID, (max 20mg/d). Decrease the dose by half in elderly patients.
- **Monitor these patients closely as these medicines have severe and distressing side effects.** Try to give the lowest dose of haloperidol that is effective for the patient. The choice of long term medical management needs to be done case by case and should only be prescribed by experienced medical personnel. Treatment should include counselling, psychotherapy and social support.

SIDE EFFECTS

1. **Parkinsonism:** Tremors, stiffness, akinesia (inability to start movements) or bradykinesia (slow movements), postural instability (feel unsteady).
2. **Oculogyric crisis:** Eye rolling movements that are involuntarily, occurs especially in young men.
3. **Torticollis:** Neck twisting movements, occurs especially in young men.
  - When a patient has symptoms of parkinsonism, the dose of haloperidol treatment is too high: lower the dose.
  - **Diazepam** may be useful in treating parkinsonism acutely.
  - If patient develops muscle rigidity and high fevers that do not seem related to infectious cause, may be drug side effect: STOP haloperidol immediately.
  - **Note:** Newer antipsychotics (e.g. risperidone) have lower risk for these side effects and should be used if available.

## 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

#### Ask if they have any symptoms of a mental health or physical condition and treat this e.g.

- Do they have 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 with above changes consider:

- **Amitriptyline:** usually at lower doses than for depression (25-50mg). **\*\*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, where the patient doesn't sleep at all for multiple nights, is a risk factor for suicide.\*\* See Section 153.

## 18.1.6 COUNSELLING

### DEFINITION

Counselling is a method used to help treat people with emotional trauma. Counselling is sometimes referred to as a 'talking cure'. This method is used to help people by talking and discussing their problems with them. The counsellor can help to find solutions to problems and find better ways of dealing with emotional trauma. Counselling generally takes some time to be effective and requires experienced counsellors to be fully effective.

#### Some of the rules:

**Confidentiality:** Whatever you learn in the counselling session is not to be told to anyone else without the person's permission. The only exception to this rule is if the person has told you that he/she plans to either harm himself or others. It is through confidentiality that a trusting relationship can develop.

**Trust:** Without trust, effective counselling cannot occur. This needs to be developed between the counsellor and the person seeking help.

**Empathy:** The counsellor needs to try to understand the person's situation as best as they can. To empathise means to see the world through another's eyes, to imagine being the person and imagine how it would feel to suffer their problems.

**Non-judgemental:** When hearing the person's problems and life story you are being placed in a very powerful position. The person has placed their trust in you and is relying upon you to accept them. People who need counselling are often in a very fragile emotional state and need acceptance and support. Not judging the person's behaviour (even though you may disagree with it) is an essential element of counselling.

**Listening:** The counsellor needs to be a good listener. Allow pauses in conversation, do not try to push the person to speak and let them tell you what they feel comfortable telling you at that time.

**Body Language:** The way a person sits and their movements often show what they are feeling. During counselling, it is important to make the person aware that you are interested and listening to them. One way of doing this is to follow these rules: **Remember the letters SOLAR:**

- |                          |   |
|--------------------------|---|
| <b>S</b> quare:          | Sit facing the person, do not sit sideways to them, and look directly at them.  |
| <b>O</b> pen:            | Sit with an open posture, do not cross your arms or lower your head.  |
| <b>L</b> eaning forward: | By leaning slightly forward towards the person you are showing them that you are interested.  |
| <b>A</b> ttentive:       | Be attentive to what they are saying, listen to them and nod your head to show you understand.  |
| <b>R</b> elaxed:         | During the counselling session be relaxed, try not to feel tense or excited; 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? Obtain their medical history and cultural background.

**3. Discover what the problem is**

Ask the person what problems they are having. Allow time for the person to talk, allow pauses in the conversation 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? Such as 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?

All these are things that can be discovered, not through one counselling session but perhaps over a series of interviews as the person becomes more relaxed and begins to trust you more. The first session is mainly to begin the process; successful counselling can take months. These questions do not necessarily need to be asked directly but the counsellor can assess or feel the real answers from the person's reactions and attitude.

**5. Positive reflection (This is generally 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 these strengths: e.g. "You have survived a lot of difficult things. You must be very strong." Or "It seems that you really enjoy talking with your cousin, and she is a great support for you" or "Listening to music seems to help you feel calm."
- Try to identify **ways that they think or do that are contributing to their mental illness**. Reflect, or explain this back to the patient without judging: e.g. "It seems that you are saying that when you are alone you start to think a lot about your baby who died, and that makes you feel more depressed" or "It seems that you always have these severe anxiety attacks before exams."
- Think of **simple changes** that the patient can do that may 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. If you hear these try to help the patient realize that 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 have passed your classes almost every time, and you have only failed once. Then you must be a generally good student." **Never blame the patient for their 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 not, 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 things to work on as "homework" 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, pick things that the patient identifies as helpful to themselves:

- Exercise: especially walking
- Talking with good supports in their own community
- Religious activity: visiting the mosque, temple or church, or private time praying or meditating
- Keeping a regular sleep schedule
- Eating regularly
- Asking 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.

#### **Some important points to remember**

- Understand that the person is taking a risk in telling you their story; it is very personal information, which you must respect.
- The person is taking a risk to confront painful memories and undergo change; the counsellor is the one to provide strength and security.
- The counsellor must be aware of the effect of hearing sad and disturbing stories and must be prepared to cope with hearing and advising on difficult life situations.
- The counsellor must be aware that they are taking on a lot of responsibility. The counsellor has a lot of power over the person's life. They need to be aware of this and not use this power in a negative way. If unaware of this relationship, the counsellor can unconsciously become a part of the problem.

#### **Finally**

The object of counselling is to help the person to find solutions to their problems, to strengthen the person and to lead them to an independent and happier/healthier life. This ideal cannot always be met but by sharing their problems with another who respects and is interested in them, and their problems, the person will leave any counselling session with more confidence and security.

### **18.1.7 SUICIDALITY/HOMICIDALITY**

#### DEFINITION

Unfortunately, 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.

- 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 many risk factors, discuss with a colleague or supervisor right away, and make a **safety plan** with the family or friends.
- Many communities along the border have used "suicide watch" techniques where friends and family take turns watching the person who is at risk to commit suicide. This can be very useful until medication and counselling can improve a patient's symptoms.
- If you have real concerns that the patient might hurt someone else, discuss with a colleague or supervisor right away and consider contacting the person at risk or the local authorities (e.g. village head).

## 18.2 SUBSTANCE ABUSE

Abuse of substances like alcohol, opiates and amphetamines can lead to both short term and long term dangers to a patient through intoxication, addiction and withdrawal. Other substances like betel and tobacco can increase cancer risk and cause other medical problems. Patients who are addicted to any of these substances may have a very hard time stopping their use. If there is a drug treatment program in your area, suggest that patients get help there. Use counselling techniques (see p.151) and ask the family and community to help.

**\*\*Note:** Addiction is a disease: treat these patients with empathy and respect, even though they can be very difficult.\*\*

### 18.2.1 ALCOHOL AND DRUG INTOXICATION

#### DEFINITION

##### **Acute intoxication:**

When the patient has taken too much of a substance (e.g. alcohol or drug) and the body cannot remove it quickly enough. Symptoms can last until the drug disappears from the body. Intoxication can lead to dangerous behavior (e.g. driving a motorbike after drinking, getting in a fight after using amphetamines) or overdose.

---

**Remember:** if a patient with an overdose of alcohol, opiates (e.g. heroin) or diazepam stops breathing but has a stable BP and HR, they can probably survive if someone helps them breathe with a bag valve mask. This may take hours: try to get family members to take turns if not enough staff.

---

##### **Addiction:**

Long term use can lead to addiction of a person to that substance. A patient may be addicted if they have three or more of the following signs:

- A strong desire to take the substance.
- Difficulty controlling taking the substance (e.g. what time of day to start, stop and the amount they take).
- Withdrawal signs and symptoms occur when the person does not take the substance for a certain time (and withdrawal stops when the person takes the substance again).
- The need to take more of the substance each time to reach the same previous 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 or have an accident because of drinking too much, but they still do not stop).

Addicted individuals eventually need the substance in order to function normally.

##### **Withdrawal reaction:**

When addicted patients stop taking their substance, they begin to experience withdrawal. The patient gets signs and symptoms that are usually the opposite of the effects of the drug. Symptoms of a withdrawal reaction can persist for several days.

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**If a chronic substance abuser wants to stop using a drug or alcohol, be prepared for the acute withdrawal reaction. Long-term follow up must be organised if possible with counsellors, the patient and the relatives, otherwise they may start using the drug again.**

---

## ALCOHOL

### **ACUTE INTOXICATION**

#### DEFINITION

Alcohol intoxication occurs when the intake of alcohol is more than the body can tolerate. This produces behavioural or physical abnormalities. In other words, the person cannot function normally and certainly should not be operating a motor vehicle.

#### SIGNS AND SYMPTOMS

- |                       |                     |
|-----------------------|---------------------|
| • Smell of alcohol    | • Euphoria          |
| • Vomiting            | • Loss of control   |
| • Change in behaviour | • Poor coordination |
| • Agitation           |                     |

With increasing amounts of alcohol intake the person can become drowsy and comatose.

## TREATMENT

- If in coma *see emergency treatment of coma p.17*
- Rehydrate with IV **NSS** when unconscious.
- If history of chronic alcoholism, give **vitamin B1** 250mg IM or in NSS bag (this helps prevent serious permanent brain damage (Wernicke's Encephalopathy see. p.188)).
- Watch for signs of hypoglycaemia (see p.54).
- Check urine output and vital signs every hour until the patient is awake.
- Position the patient in lateral coma position, because of the risk of aspiration (see coma chapter, p.17, and aspiration pneumonia p.205).
- 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** 10mg 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 (see p.54)**  
**Chronic alcohol intake is associated with vitamin B1 deficiency (see p.187)**

---

## WITHDRAWAL REACTION

Patients can die from alcohol withdrawal. Severe complications often occur around 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, poor sleep

**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 <b>decreasing diazepam</b> if patient is well.
Feeling confused					
Restless					
Miserable					
Problems with memory					
Tremor (shakes)					If ≥ 12: the symptoms are moderate to severe. Patient may be at risk for seizures. Consider <b>increasing diazepam</b> .
Nausea					
Heart pounding					
Sleep disturbance					
Sweating					

## TREATMENT

- **If patient is agitated or will not take medicine, diazepam** 10mg IV, can be repeated several times until the patient is calm but still awake.
- If patient can take medicine, give **diazepam** 10-20mg PO QID for the first 1-2 days. Then give reducing 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.

---

**Take care: if you give too much diazepam, the patient can stop breathing. Keep this patient in close observation!**

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## WERNICKE'S ENCEPHALOPATHY OR KORSAKOFF'S SYNDROME

**\*\*Note:** 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 patients has any neurological signs e.g. abnormal eye movements, memory problems, confusion, unsteady walk (when not acutely intoxicated) consider these conditions. See p.188 in Nutrition chapter for treatment.

## OPIOID/HEROINE/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 likely not to be available at clinics on the border. Treatment is symptomatic: 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. 153).

#### 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
- Minor muscle contractions, muscle pain
- Hot and cold flushes
- Anorexia
- Abdominal pain/cramps, diarrhoea

#### TREATMENT

- Symptomatic:
  - **Nausea:** give **metoclopramide** or **domperidone** if available
  - **Abdominal pain:** give **buscopan**
  - **Muscle pain:** give **paracetamol** or **ibuprofen**
  - **Diarrhoea:** give **loperamide**.
- For **severe agitation** or **anxiety** can give **diazepam** 5-10mg IV, IM or PO.
- Methadone and clonidine are used elsewhere but are not available in our setting.

## AMPHETAMINES

Several types of amphetamine 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

##### **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

Symptomatic:

- If agitated: give **diazepam**
- If psychotic: treat as for psychosis (see p. 150).

SSRIs may be helpful – **fluoxetine** 40mg or **sertraline** 100mg (start at ½ the dose and increase to full dose after 1 week)

## 18.2.2 BETEL NUT AND TOBACCO

### BETEL NUT

#### DEFINITION

Betel nut is the seed of the betel palm (*Areca catechu*). Betel nuts are often chewed for their stimulating, mildly intoxicating, stress reducing and appetite-suppressing effects on the mind. Based on these effects betel nut can be classified as a drug. When taken regularly, betel is likely to have harmful effects on health, including cancers of the stomach and mouth and damage to gums. Because so many people on the Thai-Myanmar border chew betel nut, it is important to provide information on the potential 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 (increased pulse rate)
- Worsening asthma
- Regular betel chewing causes the teeth and gums to be stained red
- Increased convulsions for epileptic patients

#### COMPLICATIONS

##### **1. Oral Cancer**

In countries and communities 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 (leucoplacy). 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 is not available in most clinics in our region.

##### **2. Vitamin B1 Deficiency**

Betel nut chewing can cause vitamin B1 deficiency. Patients with regular complaints of peripheral beri beri should be advised to stop betel nut consumption.

### 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.

**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, particularly if children.

#### 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. *See p.206*
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 really unable to stop then recommend to smoke outside and away from children to avoid passive smoking.





## CHAPTER 19: MUSCULOSKELETAL DISORDERS

### 19.1 DISORDERS OF THE JOINTS

Disorders of the joints can be due to infection (septic arthritis), non-infectious causes (inflammatory diseases), or injury (sprains and strains). The treatment of trauma is not discussed in these guidelines.

#### 19.1.1 INFECTIOUS ARTHRITIS

##### SEPTIC ARTHRITIS

###### DEFINITION

Acute bacterial infection of the joints which commonly affects a single joint but can also affect more than one joint (usually not symmetrical). It is most often spread from the blood into the joint. The most common organism causing septic arthritis is *Staphylococcus Aureus*. However, *Gonococcus* can also cause infection in sexually active young adults and *Haemophilus influenza* infection can occur in unvaccinated children. Patients with other joint problems such as rheumatoid arthritis have a higher chance of getting septic arthritis.

###### SIGNS AND SYMPTOMS

###### **Newborn or infant:**

- Voluntary immobility of the limb with the infected joint (pseudo paralysis)
- Cries when the infected joint is moved
- Irritability
- Fever

###### **Child or adult:**

- Intense joint pain
- Joint swelling and redness
- Voluntary immobility of the limb with the infected joint (pseudo paralysis)
- Limping/ non weight bearing (lower limbs)
- Fever

Consider **gonococcal arthritis**:

- 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).

Consider especially in patients with symptoms of STI e.g. urethral or vaginal discharge, lower abdominal pain

###### DIAGNOSIS

Clinical

CBC, CRP - WBC/CRP usually raised in septic arthritis

Aspiration of pus from the joint (where possible) - pus culture, gram stain

Blood culture

###### TREATMENT

---

Successful treatment of septic arthritis requires **early drainage** of infected joint fluid, **resting** of affected joint and use of appropriate **antibiotics**

---

###### **Children < 5 years:**

- Admit to IPD
- Give IV **cloxacillin** for 2 weeks AND IV **gentamicin** for 5 days followed by **oral cloxacillin** for a minimum of 2 weeks.
- If any blood or aspiration cultures grow any organisms then treat as per sensitivities.
- If do not have culture available and no improvement at day 3 consider adding IV **ceftriaxone**.
- Drain infected joint fluid with needle as soon as possible (may need multiple drainage)
- 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.

**Children > 5 years/Adults:**

- Admit to IPD
- Give IV **cloxacillin** for 2 weeks, followed by oral **cloxacillin** for a minimum of 2 weeks.
- If any blood or aspiration cultures grow any organisms then treat as per sensitivities.
- If do not have culture available and no improvement at day 3 consider adding IV **gentamicin** for 5 days +/- **ceftriaxone**.
- Drain infected joint fluid with needle as soon as possible (may need multiple drainage)
- 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 signs of gonococcal arthritis:**

- IV **ceftriaxone** until 2 days after joint improvement begins.
- Then switch to oral **ciprofloxacin** for 2 weeks.
- Add **azithromycin** 1g STAT dose OR **doxycycline** 100mg BID for 7 days (for empirical treatment of 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 NON-INFECTIOUS ARTHRITIS**

There are many causes of non-infectious arthritis.

The most common are osteoarthritis, rheumatoid arthritis and gout.

---

It can be very difficult to decide if the joint is infected or inflamed. It is very important to get a clear history.  
If in doubt, treat for both infection and inflammation.

---

**OSTEOARTHRITIS**DEFINITION

Osteoarthritis is chronic inflammation of the joints. This is caused by damage to the cartilage which is a cushion that protects the bony surfaces of joints. Once this cushion is damaged, the bony surfaces rub together and cause the patient pain when the joint is used. Osteoarthritis is caused by overuse of joints and so it is commoner in older people. The most common joints affected are the hips, knees, spine, feet and hands.

SIGNS AND SYMPTOMS

- |                                     |   |
|-------------------------------------|---|
| • Chronic joint pain and stiffness  | • Muscle wasting  |
| • Joint swelling and deformity      | • Joint pain gets worse the more they are used throughout the day |
| • Crackling noise on joint movement |   |

DIAGNOSIS

Clinical diagnosis.

X-ray of the affected joint could confirm the diagnosis, discuss with doctor if appropriate.

TREATMENT**Medication treatments:**

- **Paracetamol**
- Anti-inflammatory medication e.g. **ibuprofen, aspirin** (see p.28).
  - Often pain relief is needed long-term: be careful of side-effects, especially in older people.

**Non-medication treatments:**

- Regular gentle exercise is important for reducing 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, as do relaxation techniques.



## 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).

### SIGNS AND SYMPTOMS

- Joint stiffness, worst in the morning, which gets better the more they are used throughout the day.
- Swollen and warm 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.

### DIAGNOSIS

Clinical diagnosis.

X-ray of the affected joint could confirm the diagnosis.

CRP can be used to monitor disease response to treatment.

Check Hct to rule out associated anaemia.

---

**The aims of treatment are to:**

- 1. Relieve pain**
  - 2. Slow down/ stop joint destruction**
- 

### TREATMENT

#### Medication treatment:

1. Analgesia (see p.28) e.g. **paracetamol**, **tramadol**; Anti-inflammatory medication such as **ibuprofen** or **aspirin**
  - Anti-inflammatory medication should not be used for long periods of time if possible.
  - 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.
3. **Prednisolone** – short course
  - Should be given when initially starting DMARDs
  - Should be given during flare ups of rheumatoid arthritis.
  - **Remember:** Use the lowest dose possible. De-worm before starting, never stop steroids suddenly, explain to the patient the possible side effects of long-term steroid use (e.g. peptic ulcer, osteoporosis, glaucoma, more infections).

---

If a steroid needs to be given together with ibuprofen or indomethacin,  
add **omeprazole** in order to prevent gastric bleeding.

---

#### 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.

## GOUT

### DEFINITION

Inflammation of the joints caused by formation of crystals within the joint. These crystals are made of a substance called urate. People with gout often have high levels of urate in their blood which can be caused or made worse by certain risk factors (see below). Patients often complain of very severe pain, redness and swelling; commonly affecting the big toe. Gout is often misdiagnosed as septic arthritis or cellulitis because attacks occur suddenly. The knees and other joints in the feet are also commonly affected. Some people get only one attack whilst others might get many attacks throughout their life. Most people are older than 30 years at the time of their first attack.

### RISK FACTORS

The following risk factors cause levels of urate in the body to be high:

1. Alcohol
2. Obesity
3. Certain foods e.g. red meat, seafood
4. Medications e.g. hydrochlorothiazide, low dose aspirin

### SIGNS AND SYMPTOMS

- Severe acute joint pain
- Red, hot and swollen joint
- Fever
- Nodules on fingers, toes and elbows (called tophi) - these happen late in gout and can cause pain, press on nerves and damage joints

### COMPLICATIONS

Deformity of the affected joints, kidney stones (common), renal failure.

### DIAGNOSIS

Clinical

Serum uric acid often high (only if available – although can still have gout even if levels are low).

### TREATMENT

#### **Medication treatment**

- Anti-inflammatory drugs such as **ibuprofen** (**Note:** do NOT use aspirin).
- If no response, consider treating with **prednisolone** after consultation with doctor
- In patients with **recurrent attacks, tophi or renal stones:** consider starting **allopurinol** 100-300mg OD (can be increased slowly to a max of 900mg OD). If available aim to reduce blood **uric acid levels to < 6mg/dl** (0.36mmol/L).
- **Note:** Do NOT use allopurinol during an acute attack. Only start 3 weeks after attack. Important to take NSAIDs e.g. **ibuprofen** during the first 3 months of taking allopurinol because allopurinol can increase risk of acute gout attack.
- If on hydrochlorothiazide for high BP change to other medication as this can be a cause of gout

#### **Non-medication treatment:**

- Rest and elevate joint, ice pack may be useful
- Drink lots of water

### PREVENTION

- Weight loss
- Avoid alcohol.
- Reduce amount of red meat and seafood in diet.
- Eat lots of vegetables.

## 19.2 DISORDERS OF THE BONES

### OSTEOMYELITIS

#### DEFINITION

Osteomyelitis is an infection of the bone which occurs most commonly in children. Bacteria spread through the blood stream to the bone from an infection in another location, such as the lungs (pneumonia). Bacteria can also come from local areas of infection, such as cellulitis, ulcers or penetrating wounds. The most common bacteria in osteomyelitis is *Staphylococcus aureus*. When an acute infection has not been treated well, osteomyelitis can become chronic leading to 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
- Back pain
- General discomfort, uneasiness, or ill feeling (malaise)
- Fracture without trauma
- Drainage of pus through the skin (in chronic osteomyelitis)

**DIAGNOSIS**

CBC shows elevated WBC.

Blood cultures when the fever is high may help identify the causative organism.

Collect pus for culture from the area around infected bones by needle aspiration.

X-ray does NOT give diagnosis in the acute stage but may help in the diagnosis in later stages.

**TREATMENT**

Osteomyelitis always requires prolonged antibiotic therapy, usually at least 4 weeks (minimum 2 weeks IV), and may require surgical debridement. Severe cases may lead to the loss of a limb. Never forget pain treatment.

**Infant <4months:**

- Admit IPD
- Give IV **cloxacillin** AND IV **ceftriaxone** for 4 weeks
- If no improvement consider adding in **gentamicin IV** for 5 days
- After 4 weeks, if the patient's condition is much better, there is no more fever, and clinical signs are much improved, switch to oral **cloxacillin**.
- If any blood or aspiration cultures grow any organisms then treat as per sensitivities.

**Child >4months/ Adult:**

- Admit IPD
- Give IV **cloxacillin** for 4 weeks
- If no improvement consider adding in **gentamicin IV** and/or **ceftriaxone IV**
- After 4 weeks, if the patient's condition is much better, there is no more fever, and clinical signs are much improved, switch to oral **cloxacillin**.
- If any blood or aspiration cultures grow any organisms then treat as per sensitivities.

**If associated with wounds, diabetes mellitus or ulcer:**

- **Clindamycin** AND **Ciprofloxacin**  
OR
- **Cloxacillin** AND **Ciprofloxacin** AND **Metronidazole**.

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**Note: Longer courses may be needed – even a year may be required**

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**For all age groups after initial weeks of treatment (5-6 weeks), review need to continue antibiotics based on clinical examination, CRP and WBC.**

---

**Surgical Treatment:**

- Always evaluate the need for 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 (particularly in immunocompromised patients e.g. diabetes, steroid use) (see p.234).



## CHAPTER 20: NEUROLOGICAL DISEASES

### 20.1 HEADACHE

Headache 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:
  - Localised: e.g. meningitis/encephalitis, sinusitis
  - 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\*\***

- Acute severe headache.
- New onset, never had headache before.
- Progressive (increasing in intensity and severity).
- Caused by, or worsens with coughing, sneezing, exercise.
- Associated neurological signs and symptoms (e.g. mental disturbance, loss of memory, 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:

#### 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 p.130). TB meningitis may be much less acute and is seen on Thai-Myanmar border.

##### TREATMENT:

**Immediate antibiotic treatment** (see p.131 infectious disease chapter). Viral encephalitis will not respond to IV antibiotics. If possible do an LP before treatment (if there are no contraindications (see p.131)). Do not delay treatment if waiting for someone to do an LP.

## 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 an **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.

## 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.171 for more detail).

### TREATMENT

See Stroke (page 172).

## ACUTE (CLOSED ANGLE) GLAUCOMA

### DEFINITION

When the pressure of the eye suddenly increases which can lead to blindness.

### SIGNS AND SYMPTOMS

#### SYMPTOMS:

- Rapid onset severe pain of the eye and surrounding the eye
- Blurred vision
- Nausea
- Vomiting

#### SIGNS:

- Patient looks unwell
- Red eye
- Hazy cornea
- Non-reactive mid-dilated pupil usually only one eye

### TREATMENT:

Immediate treatment with **acetazolamide** and **pilocarpine** then **IMMEDIATE referral to hospital**. See Eye Chapter p.65.

## NON-EMERGENCY CAUSES:

### 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

- Explain to the patient that the headache is caused by chronic tension of head and shoulder muscles due to stress or to worry.
- Try to reduce tension by getting enough sleep, reducing stress at work or in the home environment and make time for exercise e.g. swimming, massages and/or hot baths.
- Use simple analgesics such as paracetamol. **Note:** overuse of painkillers e.g. paracetamol can also make the headaches worse.

## 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

- The typical migraine attack is a one-sided (sometimes both sides) beating or dull headache that can be worsened by activity.
- Commonly associated with nausea, vomiting, photophobia (not liking light), blurred vision and the sensation of a blocked nose on the side of the pain.
- Pain builds up gradually over hours and may last for several days.
- Visual disturbances (light flashes, zigzags, and/or vision field defects) occur quite commonly and can occur before onset of the headache
- There may be 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 attack take place.
- Symptoms that occur before the headache that can help the patient know that a migraine headache will start are known as an '**aura**'.
- 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 doctor if unsure as stroke is an emergency (see *stroke p.171*)

### TREATMENT

- Staying in a quiet dark room is often helpful.
- Acute attack: (doses for adults)
  1. **Aspirin** 300-900mg QID (max 4g/day) **\*\*Note:** do not give aspirin to children\*\* OR
  2. **Ibuprofen** 400mg TID (max 2.4g/day) OR
  3. **Diclofenac** (50mg at beginning of headache, repeat after 2 hours if needed then after 4-6 hours (max 200mg/d)
- If the attacks are frequent, refer to doctor for 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. Advise do not stop suddenly as 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.

## 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. (see p.147).

### TREATMENT

See treatment advice in depression chapter (see p.148).

## TRAUMA RELATED

### DEFINITION

Headache that occurs after trauma

### 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 doctor.

---

### 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**.

## 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 may be 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

Brain CT/MRI

### TREATMENT

Treatment for tumours is mostly not available on the Thai-Myanmar border. Discuss with a doctor about providing symptomatic treatment of the headache. See *palliative care chapter p.192*.

## 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

Discuss with doctor – needs quick treatment with steroids to prevent blindness.

#### **Prednisolone:**

- Always deworm before starting steroids.
- Start at 1mg/kg OD (max 60mg)
- After 1-2 weeks decrease the steroid by 10mg every 1-2 weeks depending on the response to treatment.
- Once below 30mg the dose can be dropped by 2.5mg every 2 weeks.
- 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 them but for 25% of patients a longer time is needed (some cases for life).

## OTHER: DENTAL, OCULAR, SINUSITIS, CERVICAL ARTHRITIS OR COUGH HEADACHE

### DEFINITION

Dental problems (see p.43), sinusitis (p.200) or eye problems (see p.53) 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 epileptic 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:

#### 1. GENERALISED (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\*\***

#### 2. CHILDHOOD ABSENCES 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 this with a doctor.

---

### DIAGNOSIS

- The most important step in diagnosing epilepsy is to take a good history of the episode from an eye-witness (someone who has seen the seizure). Not all seizures are due to epilepsy: you must consider other diagnoses:

<b>Seizures with fever:</b>	e.g. malaria, meningitis, hyperthermia, encephalitis.
<b>Seizures with or without fever:</b>	e.g. hypoglycaemia, severe dehydration, head trauma, amphetamines, alcohol, renal failure (uraemia).
<b>Seizures in pregnant women:</b>	e.g. eclampsia.
<b>Repeated seizures without fever:</b>	e.g. brain tumour, cysticercosis.

- Every patient presenting with a seizure should have a full neurological examination performed.
- If possible do an ECG as some cardiac arrhythmias can present as a seizure.

### TREATMENT

- For treatment of acute convulsion see 'Convulsions' section p.19.
- Drugs given in order of preference.

Seizure type	Medication to treat	Medication to avoid
<b>Infant (&lt;1year)</b> Generalised tonic clonic seizures	Phenytoin Phenobarbitone	Sodium valproate
<b>Child</b> Generalised tonic clonic seizures	Sodium valproate Carbamazepine	
<b>Child</b> Absence seizures	Sodium valproate	Carbamazepine Phenytoin Phenobarbitone
<b>Adult</b> Generalised tonic clonic seizures	Carbamazepine Sodium valproate	

- Consider starting patients on medication if the patient is having **more than two convulsions in one year**.
- Explain to the patient that this therapy is long-term and stopping suddenly could cause severe convulsions.
- Talk to the patient about epilepsy and explain to him/her that it is a disease that can be controlled.
- If the patient agrees to treatment, treat with **one medication only**.
- If the seizures are not controlled on one medication at the maximum dose, discuss the case with a doctor. It may be dangerous to stop one medication and switch to another one very quickly.
- Start with a small dose and then increase the dose until convulsions are controlled or the patient has side-effects.
- 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.

**\*\*Note: Many epilepsy medications react with other medications so always check carefully when prescribing\*\***

#### ADULT drug doses for epilepsy medications:

For child drug doses see Pharmacy Handbook or other source e.g. BNF

	Starting dose	Increasing dose	Usual dose	Max dose per day	Contraindication	Most common side-effects	Toxic effects
<b>Carbamazepine</b>	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
<b>Phenobarbitone</b>	60mg at night		60-180mg at night	180mg	Severe respiratory depression	Drowsiness, confusion, hypotension, rash	Blood disorders, respiratory depression and respiratory arrest, nystagmus, ataxia
<b>Sodium Valproate</b>	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
<b>Phenytoin</b>	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

#### 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 due to a problem in the blood supply to a region of the brain. The brain tissue beyond that artery is damaged or dies. (Brain cells need blood to supply oxygen and nutrients and to remove waste products.)

The effects of a stroke depend on how much damage occurs, and which part of the brain is affected.

### **\*\*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. **Ischaemic stroke:** caused when a blood vessel supplying the brain becomes blocked. This can happen due to hardening of the arteries (arteriosclerosis), fatty plaques that build up in the arteries (atherosclerosis) or a clot that travels from another part of the body (embolism). Responsible for 80% of all strokes.
2. **Haemorrhagic stroke:** caused when an artery in the brain ruptures. Responsible for 20% of all strokes. Hypertension is the most common cause of brain haemorrhage. 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 known as **temporary or mini stroke** causes symptoms similar to those of a complete stroke, however the symptoms disappear completely within 24 hours as the disruption of blood supply is only temporary (in a stroke, the symptoms are usually more permanent). It is a serious warning sign of worsening cerebrovascular disease. A complete stroke may follow a TIA in a matter of hours or weeks to months.

**A stroke may also be caused by different infections:** malaria, tuberculosis, cysticercosis and syphilis.

### RISK FACTORS

<b>Age</b>	The risk of stroke increases with age, especially after age 55.
<b>Sex</b>	Men are at greater risk than women.
<b>Family</b>	People with a family history of stroke have an increased risk of stroke themselves.
<b>Diseases</b>	People with diabetes, heart disease especially atrial fibrillation (irregular heart beat), high BP, HIV or prior stroke are at greater risk of stroke.
<b>Lifestyle</b>	Stroke risk increases with obesity, cigarette smoking, alcohol consumption and use of IV drugs.

### DIFFERENTIAL DIAGNOSIS

- |                            |                  |
|----------------------------|------------------|
| 1. Hypoglycaemia           | 5. Brain abscess |
| 2. Cerebral malaria        | 6. Brain tumour  |
| 3. Complex migraine        | 7. Head trauma   |
| 4. Meningitis/encephalitis |                  |

### 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:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• <b>Limb weakness</b> – usually one sided</li> <li>• <b>Facial weakness</b> – drop of one side of the face</li> <li>• Speech impairment</li> <li>• Loss of vision</li> <li>• Reduction in sensation</li> <li>• Haemorrhagic stroke: more likely to get loss of consciousness, seizure, vomiting, very high BP</li> <li>• Coma</li> <li>• Death</li> </ul> | <ul style="list-style-type: none"> <li>• Acute severe headache – described as ‘worst headache of my life’</li> <li>• Memory loss and reduced reasoning</li> <li>• Initial low tone followed by high tone and increased reflexes and up going plantars on side affected</li> </ul> |
|---|---|

**DIAGNOSIS**

Clinical diagnosis

**If acute symptoms then refer to hospital immediately**

If chronic symptoms: careful medical history, especially about when the symptoms started and what parts of the body are affected, and the presence of risk factors. Ask about any previous similar symptoms to see if the patient has had TIAs before.

Perform a neurological examination.

Ideally a CT scan or MRI scan should be done to confirm stroke and rule out other causes e.g. tumour

ECG is important to look for abnormal heart rhythms or heart abnormalities which can make people more at risk of stroke.

Check dextrose to rule out diabetes

If available: ultrasound scan of the carotid arteries to see if there is any blockage.

**TREATMENT****Treatment of Acute stroke:**

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>STROKE</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) Oxygen
<b>B</b>	RR, SpO2, cyanosis Chest indrawing/ tracheal tug Listen to chest	
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in IV cannula – take bloods e.g. Hct, CBC, MS, dextrose etc. <b>**Note: Do not give BP medication to reduce the BP as the high BP may be needed to supply the brain with more oxygen**</b>
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	Give dextrose if low
<b>E</b>	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
<b>DISCUSS WITH DOCTOR about referral</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

**Note:** If the stroke is very severe it may be more appropriate not to refer or give treatment, and follow palliative care (see p.192). Discuss with a doctor.

**Long-term treatment:**

- For comatose patients see p.17
- 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.
- Medication to lower the BP should be used very cautiously as it can cause more damage – discuss with a doctor.
- Check dextrose BID and correct if low
- Start feeding as soon as possible. Strokes can affect the nerves that make the muscles of swallowing work. This means that there is a risk of food and liquid ending up in the lungs which can cause an aspiration pneumonia. When patients feed they should be sitting up right, try to have thickened fluid, and they may need a soft diet. If the patient starts to cough when eating, stop and re-start again when stop coughing. 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** might be beneficial in some patients – discuss with a doctor.
- If available patients may benefit from a rehabilitation programmes for strokes which include physical, speech, language and mental therapy.

#### PREVENTION

- Treat diseases that put patients at risk e.g. medications for high BP (p.31), diabetes (p.53)
- Give prophylactic aspirin treatment for conditions e.g. angina (see p.36).
- Advise your patients about lifestyle advice - to stop smoking, do regular exercise, eat healthy diet and avoid excessive alcohol consumption.
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Education of the community about early recognition of stroke symptoms is important: early treatment depends on the victim, family members or other bystander.

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## 21

## CHAPTER 21: NUTRITION

## 21.1 MALNUTRITION

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.

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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.

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Children under the age of 5 can easily become 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 resulting 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?	WHEN DOES IT OCCUR?
Wasting (acute malnutrition)	Weight-for-Height z-score	Present
Underweight (acute & chronic malnutrition)	Weight-for-Age z-score	Past and present
Stunting (chronic malnutrition)	Height-for-Age z-score	Past

Acute malnutrition is an emergency, especially if severe. **ALL** children <5 years coming to IPD or OPD should have their **Weight-for-Height z-score** routinely checked.

- Take the child's weight using a baby scale (Salter Scale) and measure their height.
- Compare with the previous weight registered on their immunisation card or their lemma.
- Calculate the Weight-for-Height z-score (W/H z-score) using the Weight-for-Height z-score Table (see *paediatric guidelines*)

## ACUTE MALNUTRITION IN CHILDREN

SIGNS AND SYMPTOMS / DIAGNOSIS**1. Moderate Acute Malnutrition**

Weight-for-Height is less than -2 z-scores (between -3 and -2 z-scores in weight/height chart).

**2. Severe Acute Malnutrition**

Weight-for-Height is less than -3 z-scores OR

MUAC is less than 115 mm OR

**Bilateral pitting** oedema is present

There are three types of **severe acute malnutrition**:



(a) Marasmus malnutrition

- 'Skin and bones', looks very thin, little fat or muscle.
- Child looks like an old man.
- Wants to eat.
- W/H is less than -2 z-scores.

(b) Kwashiorkor malnutrition

- Oedema of the legs, thin upper arms.
- Skin is dry and scaly, skin disease.
- Child has a round 'moon' face.
- Does not want to eat, apathetic.
- W/H may be less or more than -2 z-scores (may be more due to oedema).

(c) Marasmic Kwashiorkor

A 'mixed' type, with a mixture of SIGNS AND SYMPTOMS.

## TREATMENT

Management of acute malnutrition depends on the clinical condition:

1. **Moderately** malnourished children need to be followed in OPD on a **Supplementary Feeding Programme (SFP)**.
2. **Severely** malnourished children should be assessed clinically to exclude any medical complications and whether they have some appetite or not; children who have an appetite and are clinically well might be considered for OPD treatment (discuss with the doctor); those with medical complications, pitting oedema or poor appetite need to be admitted to IPD on a **Therapeutic Feeding Programme (TFP)**.

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Be sure to follow the treatment protocol exactly.

The outcome depends mostly on the motivation and effort of the person feeding the child.

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### On Admission/When to discharge:

- Record the child's weight, height and the W/H z-score.
  - Mark on the chart the target weight at which you want to discharge the child from the programme:
1. **Moderate malnourished children:**
    - Discharge when Weight-for-Height is  $\geq -2$  z-scores W/H for 2 weeks in a row.
    - The average stay in a SFP is 60 days, so be patient!
  2. **Severe malnourished children:**
    - Discharge when Weight-for-Height is  $\geq -2$  z-scores W/H and no oedema for 2 weeks in a row.
    - **Note:** be sure to re-measure the child's height every month and recalculate the child's target weight.



## **MODERATE ACUTE MALNUTRITION**

(-3 TO < -2 Z-SCORES W/H)

When you see the child for the first time in OPD, take the following steps:

### 1. Evaluate the child

Conduct a medical evaluation to look for illness, oedema, acute conditions, and vaccination status.

Try to **find out from the parent(s) why the child is not growing**. Reasons may include:

- Not giving the right food or right amount of food after stopping breast-feeding (poor weaning practices).
- Not having enough food for the family.
- Not dividing the food into frequently enough small meals for the child to eat enough each day.
- Illness.
- The mother having to work, or having another baby and so has no time to look after the first one.

A home visitor can help by visiting the household and talking with the family.

### 2. Start systematic treatment and treat any other diseases – look for diarrhoea, anaemia, other chronic infections

Deworming	1-2 years > 2 years	<b>albendazole</b> 200mg OD x 3 days <b>mebendazole</b> 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
and 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 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

Explain to the child's main care-taker that it is important that the child is encouraged to eat his/her normal foods as often as he/she wants but the child should not be forced to eat. Diversity of food is important and a combination of animal-source foods and plant-source foods should be preferred to the rice-only diet. Frequency of meals depends on the child's age:

- **Birth-6m:** exclusive breast-feeding is preferred and increase the frequency
- **6-9m:** breast-feeding and 3 additional meals of different types of food, first 2-3 spoons each then progressively increase the amount as tolerated (i.e. mashed banana, rice, cooked egg, Asia Remix, etc.)
- **9-12m:** breast-feeding and 4 additional meals up to ½ cup (125ml) each, can start to eat sliced foods
- **12-24m:** 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 a 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

Ensure that any booster vaccines are given according to up to date protocols.

## SEVERE ACUTE MALNUTRITION

(< -3 Z-SCORE W/H OR BILATERAL PITTING OEDEMA OR MUAC < 115 MM)

Severe acute malnutrition is a **MEDICAL EMERGENCY** and most children will be hospitalized and need constant monitoring. However new guidelines (2013 WHO guideline) say that children who have an appetite and are clinically alert and well might be treated as outpatients, while any children with medical complications, severe oedema or poor appetite should be hospitalized.

The management of a very severely malnourished child contains 3 phases:

- Phase 1** is mostly medical initial treatment.  
The patient is started on special feeding, but is not expected to gain weight.
- Phase 2** is the nutritional part of the treatment of the patient (rehabilitation).
- Phase 3** is the follow-up once discharged from the treatment program in order to avoid a relapse

**Time-frame for the management of a child with severe malnutrition (Management of severe malnutrition: a manual for physicians and other senior health workers, WHO 1999)**

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.









### 1. 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.

HOW TO MAKE PHASE 1 - HIGH ENERGY MILK (H.E.M.)	
Ingredients and Amounts:	Instructions:
Dried skimmed milk 25 g	Boil water for 5-7 minutes.
Sugar 100 g	Mix all the ingredients into boiled water.
Vegetable Oil 27 g	Cool and use with cup.
Boiled water (fill to 1 L)	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
<b>**DO NOT STORE AND RE-USE HEM THAT HAS NOT BEEN EATEN – IT CAN CAUSE DIARRHOEA**</b>	

### 2. Record the amount of food eaten:

For example, if the child is given 8 meals in 24 hours, draw 8 circles and fill in how much the child ate. All, half, most, etc....as below

Date: xx/xx/xx							
Meal 1	Meal 2	Meal 3	Meal 4	Meal 5	Meal 6	Meal 7	Meal 8
							
None	All	Half	Slightly more than half	Most	Small amount	Less than half	

### 3. Weigh the child daily and record on the weight chart

### 4. 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.

### 5. Prevent the child from becoming cold (hypothermia):

Encourage the mother to hold the child close to her at all times. Do not wash the child during the first days.

### 6. 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 (if you give normal ORS you will give too much salt and not enough potassium) or **Rehydration Solution for Malnutrition (ReSoMal)** (see p.305).
- Continue breast-feeding.
- Treat the mother for any illness and worms, make sure she can eat well and drink 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 unbalance will most likely be corrected

**HOW TO MAKE DILUTE ORS**  
(see ORS preparation, p.305)

1 packet (size for 750ml water) of ORS powder + 1500ml clean water  
+ 30g sugar + 1.5g potassium

OR

1 packet (size for 1L water) of ORS powder + 2000ml clean water  
+ 40g sugar + 2.5g potassium

**7. 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:

**Does not look unwell/ no signs of infection:**

**Amoxicillin** 15mg/kg TID for 5 days

**AND**

**No complications**

**Severely ill** (apathetic, lethargic)

**Ceftriaxone** 50mg/kg OD

**OR**

**Complications** e.g. hypoglycaemia, hypothermia, broken skin, respiratory tract infection

**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 for which additional treatment is needed e.g. skin infection then treat accordingly.

**DO NOT FORGET TO DO A MALARIA SMEAR!**

**8. 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.
<b>and minerals (magnesium, copper) if available</b>		
Note: DO <u>NOT</u> GIVE IRON OR ANTIWORM 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.		

**9. Check child's 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)

HOW TO MAKE PHASE 2 - HIGH ENERGY MILK (H.E.M.)		
Ingredients and Amounts:		Instructions:
Dried skimmed milk	80 g	Boil water for 5-7 minutes.
Sugar	50 g	Mix all the ingredients into boiled water.
Vegetable Oil	60 g	Cool and use with cup.
Boiled water (fill to 1 L)		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
<b>**DO NOT STORE AND RE-USE HEM THAT HAS NOT BEEN EATEN – IT CAN CAUSE DIARRHOEA**</b>		

## 2. 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

## 3. The child should gain 10-20g body weight / day.

If the child has already improved from phase 1 to phase 2 and then does not gain more weight over a period of 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.

## 4. Continue medicine treatment started in Phase 1, start iron and de-worm.

1. Continue with Folic Acid, vitamin B1 and Zinc supplements.
2. Add **mebendazole** or **albendazole**
3. 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: 200mg OD for 3 months.

## 5. Check child's vaccination card:

Give all vaccines according to up to date protocol if not already given.

## 6. 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).

## 7. Emotional and physical stimulation

They 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 consideration: **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.

## 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

<b>Adolescents:</b>	<b>-3 to &lt;-2 Z-score BMI-for-age</b> (see appendix)
<b>Adults &gt;19yrs:</b>	<b>BMI 16-16.9</b> (calculate: weight (kg) / height <sup>2</sup> (m) see p.184) The person is thin and has bi-lateral pitting oedema.
<b>Pregnant and Lactating Women:</b>	<b>MUAC &lt; 230mm</b> (use if do not have 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), 1-4 kg of Asia REMix and 0.5L 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 Facility Food Provision, TBC, 2012).
- Link or 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 may present with severe malnutrition, as indicated below:

<b>Adolescents:</b>	<b>Severe Malnutrition: less than -3 z score BMI-for-age</b> (see appendix)  <b>or are in a poor clinical condition</b> (for example): <ul style="list-style-type: none"> <li>• Bi-lateral oedema not attributable to other causes.</li> <li>• Clinical marasmus – extreme thinness.</li> <li>• Night blindness.</li> <li>• Extreme pallor (paleness) – severe anaemia.</li> <li>• Vitamin and mineral deficiencies.</li> </ul>
<b>Adults &gt;19yrs:</b>	<b>BMI is less than 16</b> (calculate: weight (kg) / height <sup>2</sup> (m) see p. 184) The person is thin and has bi-lateral pitting oedema.
<b>Pregnant and Lactating Women:</b>	<b>MUAC &lt; 207 mm (or a BMI &lt; 16 kg/m<sup>2</sup>)</b> (use if do not have weight/height – see obstetric guidelines)

These people 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 feed 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	
<b>Number of meals</b>	6 to 8 meals per 24 hours
<b>Time of meals</b>	6 meals = every 4 hours 8 meals = every 3 hours
<b>Volume per meal</b>	<b>depends on the age of the patient:</b>
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

As for children, improved appetite indicates the beginning of rehabilitation. It is usual that adolescents and adults become very hungry and refuse the formula feed. A diet should be then given based on traditional foods, but with added oil, mineral mix and vitamin mix if possible. Allow the patients to eat as much as they want and provide a wide variety of foods, but 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  $> 18.5 \text{ kg/m}^2$  and adolescents until their BMI-for-age is  $> 5^{\text{th}}$  centile of the median reference values. Pregnant and lactating women should receive supplemented diet all through their pregnancy and until the child is weaned.

## 21.1.2 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**

1. Eating too much food (and therefore taking in too many calories), and/or doing little or no physical activity (most common causes)
2. Diseases such as endocrine diseases (rare)
3. Medications e.g. long term steroids

**DIAGNOSIS****BODY MASS INDEX**

The international definition of obesity is the Body Mass Index (BMI). It is a useful way to measure to see if patients are underweight, overweight or obese. By doing this it can also help to estimate the risk of developing a chronic disease.

**BMI can be used for 5-19yrs (see graph appendix p.309/310) and adults >19yrs (see classification below).**

**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.

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)} \times \text{height (m)}}$$

**How to use BMI:**

These are the cut off values for BMI for >19yrs:

CLASSIFICATION for >19yrs	BMI (kg/m <sup>2</sup> )
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). The figures are accurate for people living on the Thailand-Myanmar border.

**For example: a 70kg man who is 1.6 metres tall**

$$\text{BMI} = \frac{70}{1.6 \times 1.6} = \frac{70}{2.56} = \text{BMI of } 27 = \text{overweight}$$

**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

**It is possible to combine waist circumference and BMI to assess the level of risk of co-morbidities:**



CLASSIFICATION	BMI (kg/m <sup>2</sup> )	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

If the patient is overweight or obese check for high blood pressure and diabetes.

You need to advise your patients to:

#### EXERCISE

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

#### SMOKING

- Try to stop, if unable to stop advise to reduce.
- Passive smoking (inhaling smoke from someone else who is smoking) is also bad for you .

#### ALCOHOL

- Advise to reduce alcohol
- **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**
  - Healthy carbohydrates are the least processed (brown and wild rice, whole wheat, corn, peas, boiled dry beans). White flour and white rice may taste better, but they are less filling and make blood sugar higher.
3. Eat plenty 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
  - Replace fried snack foods with roasted or baked ones, e.g. 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, sodas
  - Try to cut down on these

**Note:** When educating about diet it is also important to 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 certain medication you may need to change the dose.

### 21.1.3 VITAMIN DEFICIENCIES

#### VITAMIN A DEFICIENCY

See the *Eye Disease* chapter for more detailed information on 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, Bitot's spots (grey-white spots on conjunctiva), dry cornea and some types of cornea damage.

##### DIAGNOSIS

Early clinical recognition and treatment are important to avoid severe complications and permanent blindness.

##### TREATMENT

###### **Children less than 6 months**

Day of diagnosis	(D 1)	50,000 IU
Next day	(D 2)	50,000 IU
One week later	(D 8)	50,000 IU

###### **Children between 6 and 11 months (<8 kg)**

Day of diagnosis	(D 1)	100,000 IU
Next day	(D 2)	100,000 IU
One week later	(D 8)	100,000 IU

###### **Children age 1 year and older and adults (>8 kg)**

Day of diagnosis	(D 1)	200,000 IU
Next day	(D 2)	200,000 IU
One week later	(D 8)	200,000 IU

###### **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.

##### • **Treatment for pregnant woman:**

\* In case of night blindness and Bitot's spot:  
Vitamin A 10,000 IU PO daily OR 25,000 IU PO per week  
for at least 4 weeks

\* In case of corneal dryness and corneal ulcer/  
keratomalacia risk of blindness outweighs risk to baby:

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 only be given by a DOCTOR)  
Also treat for cornea dryness with TEO as above

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.

As many people cannot afford meat, eggs and other foods with vitamin A, capsules need to be distributed to children to prevent deficiency. A single dose of 200,000 IU will provide one child with enough vitamin A to last for four to six months.

- |  |            |  |
|--|------------|--|
| • New born                                   | 50,000 IU  | at birth                                     |
| • Less than 6 months (if not given at birth) | 50,000 IU  |  |
| • 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 of baby 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: If you need to give doses smaller than 200,000 IU:**

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.

## VITAMIN B1 DEFICIENCY

### DEFINITION

Vitamin B1 deficiency occurs when there is not enough vitamin B1 in the body due to an insufficient diet. This is prevalent on the Thailand/ Myanmar 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.

## **BERI BERI**

### **IN ADULTS**

#### SIGNS AND SYMPTOMS

##### **A. Dry Beriberi**

###### Mild

- Numbness.
- Burning sensation or tingling in lower legs or hands.

###### Severe

- Weakness: the person cannot walk alone or stand up from squatting position.
- Reduced tendon reflexes.

##### **B. Wet Beriberi**

- Oedema (legs, trunk, face), hepatomegaly.
- Difficulty breathing.
- A rapid pulse that can lead to heart failure.

### TREATMENT

**Note:** take vitamin B1 tablets 1 hour before meals.

#### **For mild deficiency (Mild dry Beriberi)**

- **Vitamin B1** PO 100mg OD x 7 days.  
then 10mg OD x 6 weeks.

#### **For severe deficiency**

(Wet Beriberi and 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.
- Consider giving **B-Complex** or **multivitamins**, as other B vitamins may be deficient in the patient as well.

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**Advise patients not to chew betel-nut or eat lepetho when taking vitamin B supplements:  
betel-nut destroys the vitamin B1**

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**PREVENTION**

Patients should be advised 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 eating – 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.

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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**

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**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.

**Note: this is a very dangerous condition in infants and can lead to death within only a few days.**

**SIGNS AND SYMPTOMS**

Think of Beriberi in previously healthy babies when they present with one or more of the following signs:

- |   |                            |
|---|----------------------------|
| • Difficulty breathing, or very fast breathing with RR >50/min. | • Fast pulse.              |
| • Clear lungs on auscultation.                                  | • Low urine output.        |
| • Generalised oedema.   | • Not sucking well.        |
| • Voice change or loss of voice.                                | • Enlarged palpable liver. |
| • Cyanosis.   | • Vomiting.                |
|   | • Convulsions.             |

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**Note: this is an emergency.** Without treatment the child will die quickly

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**TREATMENT**

- |                        |   |
|------------------------|---|
| • Admit to IPD         | 50mg (0.5ml) TID for 1 day, then                |
| • <b>Vitamin B1 IM</b> | 10mg OD x 6 weeks                               |
| • <b>Vitamin B1 PO</b> | Vitamin B1 PO 100mg OD x 7 days, then 10mg OD x |
| • Treat the mother:    | 6 weeks   |

Tell the mother to stop eating betel nut and snack food (e.g. lepetho) for 6 weeks as these make the symptoms worse.

Take vitamin B1 tablets 1 hour before meals.

Vitamin B1: 1 vial = 1ml = 100mg.

**WERNICKE'S ENCEPHALOPATHY****DEFINITION**

Wernicke's encephalopathy is neurological symptoms caused by the effect of 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.154 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**

- Higher 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
- Encourage good diet and prevention advise above

## KORSAKOFF'S SYNDROME

### DEFINITION

Korsakoff's syndrome is a neurological condition caused by low thiamine. Associated with chronic alcohol abuse and severe malnutrition. Unlike Wernicke's encephalopathy some of the symptoms are not reversible with treatment. See *p.154 Alcohol substance abuse*.

### SIGNS AND SYMPTOMS

- Memory loss
- Confabulation – makes up gaps in memory
- Minimal conversation
- Lack of insight (is not aware that has any problems)
- Loss of interest

### TREATMENT

- As for Wernicke's encephalopathy.

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Wernicke-Korsakoff Syndrome is when the two conditions occur together.

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## CHAPTER 22: ONCOLOGY AND PALLIATIVE CARE

### DEFINITION

**Cancer** is a tumour caused by abnormal growth of cells in the body that 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 table 1).

**Oncology** is the treatment of cancer, which is mostly done through surgery, chemotherapy (drug given to kill the cancer cells) and radiotherapy (radiation beams given to kill the cancer cells). Treatment will not work for all cancers, especially more advanced cancers. Unfortunately treatment is not available at our clinics and 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:

**Table 1: Specific cancers: Signs and symptoms and investigations that may be available at border clinics**

	Signs and Symptoms	Investigations available at border clinics
Oesophageal/Mouth Cancer	Difficulty swallowing, initially to solids but then to liquids, may see mass in mouth, history of betel nut chewing	None
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	None
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	
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

Unfortunately there are limited resources available for us to investigate for cancer, and the diagnosis at our clinics is often clinical.

Ultrasound may be helpful to look for a mass e.g. in the abdomen (although this is often difficult), and an X-ray may help in identifying some cancers.

If other treatment fails e.g. antibiotics/de-worming for blood in stool, and you suspect cancer then (if possible) you need to refer to hospital for further investigation and treatment.

## 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:

1. **Oral care** use soft toothbrush, or rinse mouth with diluted salt water after eating.
2. **Prevent bedsores** by moving patient every 1-2 hours, use cushions to keep position.
3. **Prevent pain, stiffness and contractures** in muscles and joints by gently moving and massaging 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:

<b>Anorexia:</b>	<b>Prednisolone</b> 5-15mg OD in the morning can stimulate appetite, stop if no effect after 2 weeks
<b>Anxiety:</b>	<b>Diazepam</b> 2.5-5mg at night or BID (not more than 2 weeks)
<b>Chronic Diarrhoea:</b>	<b>Loperamide</b> 4mg once then 2mg per loose stool (max 16mg/d) or opioids (like <b>codeine</b> ) (if available) 10mg TID (max 60mg every 4hrs)
<b>Constipation:</b>	Increase <b>oral fluids</b> , encourage <b>high fibre foods</b> e.g. fruit and vegetables, use <b>laxatives</b> if available
<b>Emotional support:</b>	Physical methods e.g. touching (stroking, massage), ice/heat, deep breathing Cognitive methods e.g. distraction with radio, music, imagining pleasant scene, prayer
<b>Itching:</b>	<b>Chlorpheniramine</b> 4mg QID (max 24mg/day). Assess for cause.
<b>Mouth ulcers:</b>	<b>Prednisolone</b> crush a 5mg tablet and apply a few grains on to ulcer
<b>Muscle Spasm:</b>	<b>Buscopan</b> 10mg TID (max 20mg QID)
<b>Nausea/Vomiting:</b>	<b>Metoclopramide</b> 10mg TID
<b>Oral/Oesophageal Thrush:</b>	<b>Nystatin</b> give 1 lozenge 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). Oral suspension should be swilled around mouth and then swallowed.
<b>Pain:</b>	Make a plan for adequate pain relief (see p.27). You may need to try different pain medications and work with the patient to see what keeps them free from pain. Encourage other methods for pain control
<b>Urinary incontinence:</b>	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 these feelings go away, be open and listen in a non-judgmental way to the patient's concerns
- Confidentiality is the key to setting up a good relationship with the patient and family.

#### 3. Psychological support for the care givers/family

- Support the family during the patient's illness, e.g. provide gloves or materials for dressings. Ask a home visitor to support the patient and/or the family at home.
- Explain to the family how to give the medical and psychological support to the patient
- Encourage help from community members, particularly neighbours, to give the main caregiver some help and give them some time to relax, even if it is only for a few hours. This allows the caregiver to enjoy some of the things they like doing such as attending a prayer service or sports that is helpful for them during this difficult time.

**Note – palliative care can also be a very difficult subject for staff members, if you are upset then remember you can talk to your colleagues who have been through similar experiences.**

*For more information see the World Health Organisation Palliative Care Booklet*



## CHAPTER 23: REPRODUCTIVE TRACT INFECTIONS

### 23.1 REPRODUCTIVE TRACT INFECTIONS

#### DEFINITION

Diseases of the genital tract. Many of these diseases are Sexually Transmitted Infections (STIs).

If you suspect a genital tract infection you should:

- Carry out a 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**

Effective STI control is very important because STIs facilitate sexual transmission of HIV. If you suspect STI you should think about possible HIV co-infection (see p.119) and offer referral for Voluntary Counselling and Testing (VCT).

#### 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 commonly caused by *Gardnerella vaginalis* (**bacterial vaginosis**), *Trichomonas vaginalis* (**trichomoniasis**) and *Candida albicans* (**candidiasis**)
2. **Cervicitis:** an infection of the cervix.
  - Most commonly caused by *Neisseria gonorrhoea* (**gonorrhoea**) and *Chlamydia trachomatis* (**chlamydia**)

Both infections can be caused by micro-organisms (protozoal, bacterial or fungal). Both conditions have similar signs and symptoms. **In vaginitis there is usually no pain.** Cervicitis is a more severe disease and requires different treatment.

#### SIGNS AND SYMPTOMS

- Abnormal vaginal discharge
- Vulval itching/burning
- Painful intercourse
- Pain when urinating (dysuria)
- In candida vaginitis there can be vulval oedema, curd like discharge, erythema and scratch scars
- **Suspect cervicitis if there is a red and swollen cervix with a lot of purulent discharge.**

#### DIAGNOSIS

Unfortunately the tests for the vaginitis and cervicitis are very expensive, therefore a clinical case management approach is used.

**RISK FACTORS** associated with **cervicitis** are:

- Sexual partner has urethral discharge
- Sexual violence or prostitution
- New partner or the patient has had more than one sexual partner in the last three months

**\*\*You must treat patients with any of these risk factors as cervicitis\*\***

#### TREATMENT

##### TREATMENT OF VAGINITIS:

The main symptom is abnormal vaginal discharge (if have risk factors or if the cervix is red and swollen with a lot of purulent discharge treat for cervicitis see *treatment below*). Each micro-organism causes a different vaginal discharge. Treatment depends on the type of discharge and micro-organism:

Type of vaginal discharge	Responsible Micro-organism	Treatment
White, frothy discharge	Usually <i>Trichomonas</i> (protozoal infection)	<b>Metronidazole</b> (PO) 2g stat
Grey-green discharge and fishy smell	Usually <i>Gardnerella</i> (bacterial vaginosis = superficial bacterial infection)	<b>Metronidazole</b> (PO) 2g stat
White, itchy discharge	<i>Candida</i> (fungal infection)	<b>Nystatin</b> 100,000 units OD inserted high in vagina x 14 days at bedtime.

- Mixed infections (e.g. *Trichomonas*/ *Gardnerella* and *Candida*) can occur together. Treat both.
- Advise the patient to return after 7 days for review.
- If after 7 days she still has symptoms: Treat for cervicitis.

#### TREATMENT OF CERVICITIS:

- **Treat the patient for cervicitis if :  
Any of the risk factors are present**

#### OR

**If the cervix is red and swollen with a lot of purulent discharge.**

- *Gonorrhoea* and *Chlamydia* are the two major causes of cervicitis.
- In cervicitis, you must treat both *Gonorrhoea* and *Chlamydia* at the same time.

Cervicitis combined treatment regime:	For <i>Gonorrhoea</i> :	<b>Ceftriaxone</b> IM 250mg STAT
	<u>AND</u>	<u>PLUS</u>
	For <i>Chlamydia</i> :	Non-pregnant: <b>Doxycycline</b> PO 100mg BID x 7 days (Pregnant: <b>Azithromycin</b> PO 2g STAT see <i>obstetric guidelines</i> )

**Note:** In our region (South-East Asia), resistance against ceftriaxone has been reported. If a patient on ceftriaxone does not respond to treatment, show to the doctor as a culture may be needed.

#### PREVENTION OF SEXUALLY TRANSMITTED INFECTIONS

Educate patients about sexually transmitted infections, promote/provide condom use, promote single sexual partnerships.

### PELVIC INFLAMMATORY DISEASE (PID)

#### DEFINITION

Infections above the cervix (endometritis, salpingitis, tubo-ovarian abscess, pelvic peritonitis) which 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 together with a 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 when you treat for gonorrhoea.

#### TREATMENT

Gonorrhoea, chlamydia and anaerobic bacteria are the most common causes of PID. In the OPD management of PID you must treat all three at the same time.

PID combined treatment regime (OPD Management):	For <i>Gonorrhoea</i>	<b>Ceftriaxone</b> IM 250mg STAT
	<u>AND</u>	<u>PLUS</u>
	For <i>Chlamydia</i>	Non-pregnant: <b>Doxycycline</b> PO 100mg BID x 14 days <b>**Note:</b> single dose 1g azithromycin is not effective against PID)** (if pregnant see <i>obstetric guidelines</i> )
	<u>AND</u>	<u>PLUS</u>
	For Anaerobic bacteria	<b>Metronidazole</b> 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:

- **Ceftriaxone** IM 250mg OD AND
- **Doxycycline** PO 100mg BID x 14 days AND
- **Metronidazole** PO/IV 500mg TID

Give this regime until patient's conditions improved, then continue only with:

- **Doxycycline** PO 100mg BID and
- **Metronidazole** PO 500mg TID for total 14 days

---

**For postpartum sepsis:** Consider retained placenta and discuss with obstetrician about referral for manual placenta removal. (see *obstetric guidelines*)  
Change antibiotics: **Ampicillin AND gentamicin AND metronidazole**

---

**Note:** Consider referral if the patient has signs of acute abdominal pain (see p.77) or not better in 3 days of treatment. Before referral give IV fluid and give antibiotic treatment.

PREVENTION

Educate patients about sexually transmitted diseases, promote/provide condom use, promote single sexual partnerships.

## 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 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 depends on the type of lesion (sore, ulcer, wart):

Type of lesion	Treat for	First choice regime	Second choice regime
Genital ulcers (open sore or lesion)	Syphilis	<b>Benzathine penicillin</b> IM 2.4 MIU STAT <sup>1</sup> <b>Note:</b> If the duration of infection is unknown, take it as late syphilis (>2 years) and give one injection per week for 3 weeks	<b>Procaine penicillin</b> IM 1.2 MIU OD x 10 days <u>OR</u> <b>*Doxycycline</b> PO 100mg BID x 14 days If pregnant: <b>erythromycin</b>
	<u>AND</u>	<u>PLUS</u>	<u>PLUS</u>
	Chancroid	<b>Ciprofloxacin</b> PO 500mg BID x 3 days ( <u>OR</u> <b>Erythromycin</b> PO 500mg QID x 7 days <u>OR</u> <b>Azithromycin</b> PO 1g STAT)	<b>Ceftriaxone</b> IM 250mg stat

Genital ulcers <sup>2</sup> (small, painful blisters)	Herpes	Wash with soap and water Apply <b>gentian violet</b> x 5 days <b>Paracetamol</b> 1g QID x 5 days <b>Acyclovir</b> 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 <b>Paracetamol</b> PO 1g QID x 3 days <u>External warts &lt;3 cm:</u> <b>Podophyllotoxin</b> <sup>3</sup> 0.5% solution – apply with cotton bud twice daily for 3 consecutive days/week up to 4 weeks <u>Vaginal warts:</u> Same as external wart <3cm but solution must be applied by medical person only <u>External warts &gt;3 cm and cervical, intraurethral, rectal or oral warts:</u> May need surgical removal or cryotherapy	

\* **Note:** Not in pregnancy: In pregnancy change doxycycline for erythromycin 500mg QID for 14 days.

- <sup>1</sup> Because of the volume, this dose of benzathine penicillin is usually given as two injections at separate sites.
- <sup>2</sup> 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.
- <sup>3</sup> Podophyllotoxin is contraindicated in pregnant and breastfeeding women. Improper use may result in painful ulceration.

## PREVENTION

Educate patients about sexually transmitted diseases, promote/provide condom use, promote single sexual partnerships.

Treat the patient and the partner.

## SEXUALLY TRANSMITTED INFECTIONS (STIS) IN MEN

### DEFINITION

Diseases that are 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
- Single or multiple warts in genital/anal area
- Urethral discharge and dysuria is common in gonorrhoea

### 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:

Type of lesion	Treat for	First choice regime	Second choice regime
<b>Genital ulcers</b> (open sores) on glans penis	Syphilis          AND  Chancroid	<b>Benzathine penicillin</b> IM 2.4 MIU stat <sup>1</sup> <b>Note:</b> If the duration of infection is unknown, take it as late syphilis (>2 years) and give one injection per week for 3 weeks  <b>PLUS</b>  <b>Ciprofloxacin</b> PO 500mg BD x 3 days (OR <b>erythromycin</b> PO 500mg QID x 7 days OR <b>azithromycin</b> PO 1g stat)	<b>Procaine penicillin</b> IM 1.2 MIU OD x10 days (OR <b>doxycycline</b> PO 100mg BID x 14 days)    <b>PLUS</b>  <b>Ceftriaxone</b> IM 250mg stat
Penile or urethral discharge, pus, urethral irritation burning in passing urine	Gonorrhoea   AND  Chlamydia	<b>Ceftriaxone</b> IM 250mg stat (OR <b>azithromycin</b> PO 1g stat)  <b>PLUS</b>  <b>Doxycycline</b> PO 100mg BID x 7 days (OR <b>azithromycin</b> PO 1g stat)	         <b>Erythromycin</b> PO 500mg QID x 7 days
Inguinal swelling ( <b>Lymphogranuloma Venereum</b> ) painful bubo	Chlamydia	<b>Doxycycline</b> PO 100mg BID/ 200mg OD x 7days (OR <b>azithromycin</b> PO 1g stat)	
<b>Genital ulcers</b> (small, painful blisters)	Herpes	Wash with soap and water Apply <b>gentian violet</b> x 5 days <b>Paracetamol</b> 1g QID x 5 days <b>Acyclovir</b> 200mg 5 times/day x 7 days (give within 5 days of first attack, but within 24hrs of symptoms if recurrent attack)	
<b>Genital papule</b> (separate, with dimple in centre)	Molluscum Contagiosum	Wash with soap and water Will disappear in about 8 weeks	
<b>Genital warts</b> (in groups, like cauliflower)	Condyloma Acuminata	Wash with soap and water Paracetamol PO 1g QID x 3 days <u>External warts &lt;3 cm: Podophyllotoxin</u> 0.5% solution – apply with cotton bud twice daily for 3 consecutive days/ week up to 4 weeks <u>External warts &gt;3 cm and intraurethral, rectal or oral warts:</u> May need surgical removal or cryotherapy	

<sup>1</sup> Because of the volume, this dose of benzathine penicillin is usually given as two injections at separate sites.

## PREVENTION

Educate patients about sexually transmitted diseases, promote/provide condom use, promote single sexual partnerships.

Treat the patient and the partner.



## CHAPTER 24: RESPIRATORY DISEASES

### 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 areas 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 and main bronchi. Bronchial breath sounds heard in the lungs are a sign of pneumonia.

**The most common abnormal sounds heard are:**

1. **Crepitations:** are crackles made when air enters the alveoli and small bronchi and makes them open. Crepitations are also the sound of air bubbling through mucus or fluid in the alveoli. If crepitations disappear after coughing, they are probably not significant.
2. **Wheeze:** is a whistling sound caused by air passing through narrowed airways. Wheeze is heard in both lungs in asthma, many cases of chronic obstructive pulmonary disease (COPD) and some cases of pulmonary oedema. It can be associated with infection, especially in children <2yrs (bronchiolitis). 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.
3. **Pleural Rub:** is a rough creaking sound usually heard in only one area during inspiration and expiration. It is caused by movement of the two pleural surfaces over each other when the surfaces are rough because of inflammation (e.g. pleurisy caused by pneumonia, TB).

### 24.2 ACUTE RESPIRATORY INFECTIONS (ARI)

ARIs can be divided into

1. **Upper Respiratory Tract Infections (URTIs):** ear, nose, throat, tonsils, sinuses
2. **Lower Respiratory Tract Infections (LRTIs):** lungs

#### 24.2.1 UPPER RESPIRATORY TRACT INFECTIONS

(For otitis see Ear Diseases Chapter)

##### 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 (so do not need antibiotics) and last for a short time only. 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. In any community, a lot of people will have a cold at the same time.

##### SYMPTOMS:

Nasal discharge or block, sore throat, cough, mild fever, lacrimation

##### TREATMENT:

**Paracetamol** 3 days, advise when to come back to clinic.

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 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; Child 15mg/kg TID for 7-10 days
- If no response within 48 hours consider switching to **co-amoxiclav**.

## PHARYNGITIS

### 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.
- Symptoms typically get worse over 2 to 3 days and then gradually go, usually within a week.

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**\*\*Note:** if there is a grey membrane on the back of the throat suspect diphtheria (see p. 202)\*\*

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### TREATMENT

Analgesia e.g. **paracetamol**  
No antibiotics

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**Infectious mononucleosis** (caused by Epstein Barr Virus (EBV)) is a type of pharyngitis found in adolescence and young adults. Symptoms are extreme fatigue, generalised adenopathy and often splenomegaly.

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## TONSILLITIS

See photo p. 230

### 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 on the tonsils.
- Most cases of viral tonsillitis start to settle after 3 to 4 days.



**The following symptoms make bacterial tonsillitis more common:**

1. Absence of cough
2. Fever  $>38^{\circ}\text{C}$
3. At least one enlarged and painful anterior cervical lymph node
4. Presence of pus on tonsils.

**COMPLICATIONS:**

See photo p.300

**1. Peritonsillar abscess**

- o SYMPTOMS: fever, intense pain, hoarse voice, trismus (cannot open mouth fully), tonsillar swelling on one side which moves uvula to one side
- o TREATMENT: need surgical drainage as well as antibiotics as for tonsillitis (see below)

**2. Rheumatic fever (see p.39)****3. Acute glomerulonephritis (see p.104)****TREATMENT**

Treatment with antibiotics if suspect bacterial cause, can help prevent these complications.

- Treat the fever and advise the patient to drink plenty of fluids.

**If the patient can take PO tablets and can eat and drink:**

<b>Adult:</b>	<b>Penicillin V</b> PO 500mg QID x 10 days <b>OR Benzathine penicillin</b> IM 1.2 million IU STAT
<b>Child:</b>	<b>Penicillin V</b> PO 15mg/kg QID x 10 days <b>OR Benzathine penicillin</b> IM 25,000-50,000 IU/kg (max 1.2 million IU) STAT

**\*\*Note:** shorter courses of penicillin V do not prevent Rheumatic Fever\*\*

**If allergic to penicillin:**

	<b>Erythromycin</b> PO x 10 days	<b>OR</b>	<b>Azithromycin</b> PO x 3 days
<b>Adult:</b>	500mg QID		500mg OD
<b>Child:</b>	8 - 18 yrs      250 - 500mg QID		20mg/kg (max 500mg) OD
	2 - 8 yrs      250mg QID		20mg/kg (max 500mg) OD
	1m - 2 yrs      125mg QID		20mg/kg (max 500mg) OD

**\*\*Double dose in severe infection\*\***

**If the patient cannot take tablets and cannot eat or drink, admit to IPD and give IV fluids and treat with antibiotics as follows:**

<b>Adult:</b>	<b>Benzathine penicillin</b> IM 1.2 million IU STAT <b>OR Benzyl penicillin</b> IV 1.2g QID <b>OR Ampicillin*</b> IV 1g QID
<b>Child:</b>	<b>Benzathine penicillin</b> IM 50,000 IU/kg STAT (max 1.2 million IU) <b>OR Benzyl penicillin</b> IV 25mg/kg QID <b>OR Ampicillin*</b> IV (see p.253 for dose)

Change to **penicillin V PO** when the patient can swallow. Treat for a total of 10 days.

\*Monitor for rash: if gets rash may be because diagnosis is Epstein Barr Virus (EBV) as the virus reacts with ampicillin causing a rash.

**CROUP**

(See Paediatric Guidelines)

Croup is a viral infection causing swelling around the vocal cords in children. Symptoms are a barking cough, with or without respiratory distress. Treatment depends on severity. See paediatric guidelines.

**PERTUSSIS**

(See Paediatric Guidelines for pertussis in children)

**SURVEILLANCE**  
See appendix

**DEFINITION:**

Pertussis, 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:**

- Initially mild ARI symptoms.
- After one to two weeks coughing is followed by an inspiratory 'whooping' sound mostly at night, and vomiting.
- Fever is often absent or not too high, and the clinical exam may be normal between episodes of coughing.
- After weeks or months the symptoms gradually resolve.

**TREATMENT:**

Try to isolate patients

Antibiotics: give in first 3 weeks after onset of cough

First line:	<b>Azithromycin</b> PO	Adult: D1 500mg STAT, D2-D5 250mg OD Child: 10mg/kg OD (max 500mg) x 5 days
Second line:	<b>Erythromycin</b> PO	Adult: 500mg QID x 7 days Child: dose as for tonsillitis p.201 x 7days

**PREVENTION:**

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

## **ACUTE EPIGLOTTITIS**

(EMERGENCY - SEE PAEDIATRIC GUIDELINES)

Epiglottitis is a severe bacterial infection of the epiglottis seen in children. Rapid development with sore throat, high fever, stridor. **\*\*This is an emergency. Sit child upright even if child wants to lie down, do not examine throat as you may make the swelling worse and block the airway. This child needs nebulised adrenaline, ceftriaxone and emergency referral.\*\*** (see Paediatric Guidelines)

## **DIPHTHERIA**

 URGENT REPORT  
SEE APPENDIX
**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.

See photo p.300

**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

**COMPLICATIONS:**

1. Myocarditis
2. Neuropathies
3. Renal failure
4. Pneumonia

**TREATMENT**

- **Immediate strict isolation. Refer quickly if possible.**
- **Nose and throat samples for culture if available.**
- If strong suspicion start antibiotic treatment

<b>Adult:</b>	<b>Benzathine penicillin</b> IM 1.2 million IU STAT <b>OR Benzyl penicillin</b> IV 2.4g QID x 7 days
<b>Child:</b>	<b>Benzathine penicillin</b> IM 50,000 IU/kg (max 1.2 million IU) STAT <b>OR Benzyl penicillin</b> IV 50mg/kg QID x 7 days

If allergic to penicillin: **Erythromycin** PO Adult: 500mg QID; Child: dose as for tonsillitis p.200 x 7days

- Give antitoxin serum (see below)
- Antitoxin serum** should be given with caution, because of common allergic reactions:
- Give 0.1ml SC. Wait 15 min. If no allergic reaction or erythema around the injection site give 0.25ml SC.
  - Observe for further 15 min before injecting the rest IM or IV
  - Same dose for adults and children
  - Give IV if more than 20,000 units in 200ml NSS over 4 hours.

<b>Laryngitis or pharyngitis</b>	20,000 - 40,000 units
<b>Rhinopharyngitis</b> (inflammation nasal and pharyngeal mucosa)	40,000 - 60,000 units
<b>Serious form or &gt;48hours after onset of symptoms</b>	80,000 - 100,000 units

---

**\*\*Note:** having the disease does not give you immunity,  
you need to update the vaccination once patient has recovered\*\*

---

### PREVENTION

Routine vaccination and mass vaccination in an epidemic

Close contacts

- Treat with **benzathine penicillin** (single dose IM) or **erythromycin** (7 days orally) (as per treatment dose).
- If possible quarantine and do daily monitoring (throat exam and temperature) for 7 days
- Check vaccination status:
  - If less than 3 vaccines: **complete course**
  - If received 3 injections and had last injection more than one year before: give a **booster dose**.

## 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, NPA result 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

## 24.2.2 LOWER RESPIRATORY TRACT INFECTIONS (LRTIS)

### BRONCHIOLITIS

(see Paediatric Guideline)

**Bronchiolitis** is a viral infection of the tiny airways, called the bronchioles in children.

### PNEUMONIA

### DEFINITION

Pneumonia is an infection affecting the lungs and smaller airways. These can be viral, bacterial, parasitic or fungal infections.

### 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 SpO<sub>2</sub> (<94%)
- Chest indrawing or nasal flaring

#### DIAGNOSIS

To diagnose an adult with pneumonia they must have:

1. Fever AND
2. Cough AND
3. Abnormal chest sounds

Chest X-ray can confirm a pneumonia if diagnosis is not clear e.g. not responded to antibiotics

**Note:** Think about Beriberi (see p.187) in babies < 1 year with sudden fast breathing **and no or low-grade fever**

#### ADULT PATIENTS AT RISK

- Aged 65 years or more.
- Patient with malnutrition or severe anaemia.
- Patient with heart failure.
- Patient with measles.
- Patient with splenectomy or sickle cell disease
- Immunocompromised e.g. HIV with CD4 <200

**\*\*If your 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 differs depending on:

1. The presence of signs of severe illness (see above)
2. If the patient is from the 'at risk group'

**NON-SEVERE PNEUMONIA** = no signs of severe pneumonia

- Adults: **Amoxicillin** PO Adult: 500mg TID; Child 15mg/kg TID x 5-7 days
- **Paracetamol** for fever, increase oral fluid intake

**SEVERE PNEUMONIA** = signs of severe pneumonia (also consider case by case if from 'at risk group')

#### EMERGENCY TREATMENT

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>SEVERE PNEUMONIA</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	<b>Oxygen</b> (maintain SpO <sub>2</sub> >94%)
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	<b>Nebulisers</b> if have wheeze If dyspnoea <b>sit up right</b>
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in <b>IV cannula</b> – take bloods e.g. Hct, CBC, MS, BC, dextrose etc. If signs of shock give fluid bolus <b>NSS</b> 500ml
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	<b>Ampicillin</b> IV Adult: 1g; Child 50mg/kg +/- <b>additional antibiotic</b> (see below) (give IM ampicillin if cannot put in cannula) <b>Paracetamol</b> 1g Give dextrose if low
<b>E</b>	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

#### 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 required – keep O<sub>2</sub> saturations above 94%
- Give vitamin A treatment dose to all children < 12 years.
- Antibiotics for adults: (*If pregnant refer to Obstetric Guideline*)
  - o **Ampicillin** IV Adult: 1g TID; Child 50mg/kg TID
  - o +/- **additional antibiotic** (see below)
  - o Switch to PO **amoxicillin** Adult 500mg TID; Child 15mg/kg TID when condition improves (total 7 days of antibiotics)
- Check temperature, pulse rate and respiratory rate regularly to see if the patient is getting better or worse.

#### Additional Antibiotic/Treatment:

This may be required if:

- The patient is very unwell**
- There is a poor response to ampicillin/ amoxicillin**
- There are recurrent episodes of pneumonia**

Discuss with the doctor to see if any additional antibiotics/treatments are required:

- Atypical Pneumonia:** pneumonia caused by bacteria e.g. *Legionella*, *Mycoplasma*, *Klebsiella* that do not respond to routine antibiotics. Discuss with the doctor about giving an alternative antibiotic e.g. **gentamicin, doxycycline, erythromycin, azithromycin**.
- Staph Aureus Pneumonia:** particularly if skin infection, patient looks very unwell, CXR shows necrotizing lesions. Treat with IV **cloxacillin**.
- 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) see p.216.
- 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.17). If suspect an aspiration pneumonia e.g. a comatose patient develops signs of ARI **treat as per pneumonia + metronidazole**.
- 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 (p.119).
- 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 (see below), intestinal worms (p.97), lymphatic filariasis (p.137)) or as inflammatory or allergic reactions (including asthma see p.210). 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 individuals with HIV with low CD4 count (see *HIV p.125*).

**PARAGONIMUS****DEFINITION**

Paragonimus is a 'flake' (short flat worm) that mainly affects the lungs. It is caused by eating infected, undercooked, fresh water crabs and crayfish

**SYMPTOMS**

2 most common symptoms are:

1. **Productive cough >2 weeks**
2. **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 Child>2yrs/Adult: **praziquantel PO** 25mg/kg TID for 3 days. Praziquantel can be given in 2<sup>nd</sup> and 3<sup>rd</sup> trimester of pregnancy.

**24.3 CHRONIC RESPIRATORY DISEASES**

There are many chronic diseases affecting the lungs. It is important to try and diagnose which one the patient has as the treatment is different. An X-ray (if available) may be helpful.

**TREATMENT****Aims of Treatment of Chronic Lung Disease:**

- Slow the progress of the disease
- Relieve symptoms
- Improve capacity for exercise
- Give patient the best quality of life that is possible
- Prevent exacerbations
- Prevent complications
- Educate the patient to understand the disease
- Psychosocial support
- Reduce number of clinic attendances

**Some treatment is the same for all chronic lung disease:**

1. **Educate the patient** on the disease:
  - o Unfortunately (except for asthma) these are diseases that are not reversible, so it is likely that their symptoms will become worse
2. **STOP SMOKING**, if family smoke advise them to smoke away from the patient e.g. outside
3. **Treat bacterial infections** quickly – educate the patient on the signs of pneumonia and when to go to clinic. Advise them that if they have a change in the amount of dyspnoea, colour of sputum they must come to OPD.
4. Consider **prophylactic antibiotics** for those with repeated infections
5. **Pulmonary rehabilitation:**
  - o Breathing exercises to increase respiratory muscle strength.
  - o Gentle exercise to stay healthy.

**Monitor the patient's response to treatment:**

- If the breathing is better or worse
- If any other signs and symptoms are better or worse
- If they can do more things than before the treatment
- If they can do the same things now but faster
- If they can do the same things but are not so breathless
- If they 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 and hypoxia of the kidney.

### 24.3.1 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.




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**\*\*Note:** It is important to rinse mouth out with water (spit water out, do not swallow) after using inhaled steroids to prevent oral candida\*\*

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### 24.3.2 PEAK FLOW METERS

A **peak flow meter** is a cheap and simple device and should be available in all clinics.

It can be used to:

1. Assess how bad the lung damage is – it is possible to compare to the normal expected value for height and age (see *annex p.appendix 3*)
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 p. appendix 3) gives normal measurements for patients according to their height and age.



### 24.3.3 SPECIFIC DISEASES

#### CHRONIC OBSTRUCTIVE PULMONARY DISEASE

##### DEFINITION

**Chronic Obstructive Pulmonary Disease (COPD)** is a form of chronic lung disease that 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.

##### **Note: COPD patients often have lower oxygen saturations:**

Often patients with COPD survive with a lower oxygen level than people who have normal lungs and do not smoke. If you give them too much oxygen (e.g. when they are acutely unwell) their body is not used to it so the brain tells their body to breathe less which makes them more unwell. It is important in an emergency to aim for saturations 88-92% and not to give more than 5L.

##### SIGNS AND SYMPTOMS

The signs and symptoms of COPD are similar to asthma, but in **COPD the damage is permanent** and the **symptoms are persistent**:

- 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.

On examination you may find:

- |  |  |
|--|--|
| • Fast RR                                    | • Wheeze   |
| • Accessory muscle working on expiration     | • Cyanosis   |
| • Hyperventilation                           | • Signs of heart failure (because of the back pressure on the heart from the lung disease) |
| • Reduced chest expansion                    | • Low SpO <sub>2</sub>   |
| • Resonant or hyper resonant percussion note |  |
| • Quiet breath sounds                        |  |

**\*\*Note:** the patient may always have a fast RR/ wheeze/ cyanosis/ low SpO<sub>2</sub> but it is important to know when the patient comes in to the clinic if the symptoms are **worse or different to normal** e.g. sputum colour normally white but now green, or normally dyspnoea when walking but now dyspnoea at rest. If the patient is having an **acute attack** they need **emergency ABCDE treatment\*\***

##### DIAGNOSIS:

Clinical, a chest X-ray may show hyper-expansion of the lungs +/- bullae. Do not forget to rule out TB.

##### TREATMENT

##### **EMERGENCY (ACUTE) TREATMENT:**

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p. 12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*



	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>COPD ATTACK</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	<b>Oxygen</b> maintain saturations 88-92% <b>**Note: too much oxygen can be dangerous in these patients** Give no more than 5L</b>
<b>B</b>	RR, SpO <sub>2</sub> , cyanosis Chest indrawing/ tracheal tug Listen to chest	<b>Salbutamol Inhaler</b> 10 puffs <b>OR</b> <b>If low SpO<sub>2</sub>/cyanosis/cannot speak: Salbutamol Nebuliser</b> 5mg STAT <b>Sit up right</b>
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in <b>IV cannula</b> – take bloods e.g. Hct, CBC, MS, BC, dextrose etc. If signs of shock give fluid bolus <b>NSS</b> 500ml
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	<b>Antibiotic:</b> <b>Ampicillin</b> IV 1g <b>OR</b> <b>Amoxicillin</b> PO 500mg (see below) (give IM ampicillin if cannot put in cannula) <b>Steroid:</b> <b>Prednisolone</b> PO 40mg (continue for 7 days) <b>OR</b> <b>Hydrocortisone</b> IV 100mg if unable to take PO <b>**Note: IV aminophylline is not recommended for COPD attack**</b> Give dextrose if low
<b>E</b>	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

**\*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:**

Unfortunately the changes to the lung are irreversible, and there is little treatment available for chronic COPD in our clinics.

**1. Post discharge**

- Complete 5-7 days of antibiotics.
- Complete 7 days of 40mg prednisolone.

**2. Lifestyle and general advice**

- Stop smoking, 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.

**3. 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 (see specific manufacturer instructions)).
- Mucolytics 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**

1. Recurrent chest infection
2. Reduced exercise tolerance
3. Poor nutrition and weight loss
4. Heart failure
5. Raised haematocrit (polycythaemia)
6. Respiratory failure
7. Pneumothorax
8. Lung cancer (secondary to smoking)

## 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
- Many loud crepitations in inspiration and expiration.

### DIAGNOSIS:

Clinical, 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 educate them on the symptoms and when they should come in to the clinic to get antibiotics. They may need prophylactic antibiotics to stop them getting recurrent infections.

## 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

1. No cause (idiopathic fibrosis)
2. Exposure to substances like silicon
3. Some medications e.g. nitrofurantoin, methotrexate, amiodarone
4. Chronic diseases e.g. rheumatoid arthritis

### SIGNS AND SYMPTOMS

- In the early stages, no signs and symptoms
- 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 crepitations both lungs

### DIAGNOSIS

Clinical.

CXR can be very helpful if available, it may show reticulo-nodular shadowing in the parts of the lung affected.

### TREATMENT

Some interstitial lung disease may respond to steroids. It is important to deworm before giving steroids, and to warn the patient that there are side effects of steroids. Try to manage the patient's symptoms with the lowest dose of steroids.

## ASTHMA

### DEFINITION

Asthma is a chronic inflammatory disorder of the airways, with acute reversible airflow obstruction. Acute asthma attacks can be triggered by different things in different people. Asthma is most common in children and young adults.

Asthma attacks can be triggered by:

1. **Allergens** e.g. pollen, animal fur – often have a history of other allergies and eczema
2. **Infections**
3. **Air particles** (e.g. cigarette smoke).
4. **Drugs** e.g. aspirin, NSAIDs, beta blockers, diazepam, codeine
5. Other: acid reflux, cold air, exercise, emotion, stress (e.g. maybe worse in holidays vs work/school)

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**Asthma can kill people and cause failure to grow in children**

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SIGNS AND SYMPTOMS

- Wheezing on breathing out
- Shortness of breath.
- Chest feels tight
- Decreases in peak flow.
- Coughing (either during the day or at night, but often worse at night and with exercise and activity)

DIAGNOSIS

Diagnosis of asthma is by:

1. **History** – What symptoms? Worse at any time of year/time of day e.g. cough at night? Any history of eczema/allergies? Any family members have eczema/allergies/asthma?
2. **Examination - Note:** in between exacerbations when has no symptoms will have a normal chest examination
3. **Peak flow** – see above p.207
4. **Improvement of symptoms/peak flow with treatment** e.g. salbutamol inhaler

**Note:** do NOT diagnose asthma on one episode of wheezing especially in children

**Note:** If the patient has fever, haemoptysis (coughing up blood) or green sputum then asthma cannot be the ONLY diagnosis, consider infection/TB.

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:

- 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

Diagnosis of asthma is **LESS** likely if:

- 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 PEFr when has symptoms
- No response to treatment
- Clinical features of other diagnosis e.g. significant smoking, heart disease.

**ACUTE ASTHMA ATTACK**DEFINITION

An acute asthma attack is a **sudden deterioration in the asthma symptoms**.

Acute asthma attacks can kill people, patients can become very unwell very quickly so it is important to assess these patients well and provide quick treatment.

TREATMENT


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It is very important to treat acute asthma attacks using **DR-ABCDE** and during this process assess for the **severity** of the attack

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You have to decide the **severity** of the attack (see table below):

Is it a MILD, MODERATE, SEVERE or LIFE-THREATENING attack?

This is very important because the treatment is different

To decide the SEVERITY, you have to check: (see Table 1 below):

- |  |   |
|--|---|
| • Pulse rate.                                      | • Presence or absence of wheeze.            |
| • Respiratory rate.                                | • Presence or absence of chest indrawing    |
| • Degree of difficulty breathing.                  | • Peak flow value (see instructions p.207). |
| • How many words the person can say in one breath. | • Oxygen saturations                        |

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Remember that people with asthma can also have other illness such as bronchitis, pneumonia, TB, heart failure or pneumothorax (collapsed lung), worms  
In a patient with asthma be careful: **look for and treat any other illness present at the same time.**

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## EMERGENCY ACUTE TREATMENT FOR ASTHMA ATTACK

**\*\*Note:** For all unwell patients a full ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>ASTHMA ATTACK</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	<b>Give 10-15L oxygen</b> if saturations low – aim $SpO_2 >94\%$ . <b>Note:</b> if not able to measure saturations then just give oxygen
<b>B</b>	<b>Assess severity of breathing problems?</b> o <b>Are they breathless at rest?</b> o <b>What is the RR?</b> o <b>What are the oxygen saturations?</b> o <b>Able to speak – words? Full sentences?</b> o <b>Listen to the chest – any wheeze? Silent chest?</b> o <b>Any chest indrawing?</b>	<b>Salbutamol nebuliser</b> Adult/>5yr: 5mg STAT; Child <5yr: 2.5mg STAT <b>OR</b> <b>Salbutamol inhaler</b> 10 puffs STAT (depends on severity – see below) <b>Sit up right</b>
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	Put in <b>IV cannula</b> – take bloods e.g. Hct, CBC, dextrose etc. If signs of shock give fluid bolus <b>NSS 500ml</b>
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	<b>Steroid:</b> <b>Prednisolone</b> PO Adult: 40mg; Child: 1mg/kg (max 30mg) (continue for 7 days) <b>OR Hydrocortisone</b> (if unable to take PO) Adult: IV 100mg; Child: 4mg/kg
		<b>Antibiotic:</b> <b>Ampicillin IV OR Amoxicillin PO ONLY IF SIGNS OF INFECTION</b> e.g. fever, productive cough
		If severe and not improving, discuss with doctor and consider IV <b>aminophylline</b> , IV <b>magnesium</b> or IM <b>adrenaline</b> Give dextrose if low
<b>E</b>	AVPU/GCS Expose and examine all over body	Review notes and charts History, further investigations, treatment plan
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

**Antibiotics for Asthma Acute Attack:**

**Most acute attacks of asthma should NOT be given antibiotics.** Only give antibiotics if there is evidence of infection e.g. temperature, productive cough etc. **Note:** this is different to COPD where most cases should be given antibiotics

Treatment of ACUTE asthma has three parts (all are important):

1. Supportive: **Oxygen**
2. Short term: **Salbutamol**
3. Treatment of inflammation: **Steroids (prednisolone or hydrocortisone).**

**Note:** always deworm patient when steroids are started (see p.97).

**DECIDE THE SEVERITY AND TREAT ACUTE ASTHMA.**

All symptoms and signs may not be present. The presence of **ANY ONE** feature makes the higher severity likely e.g. if the patient is alert but they have a silent chest on auscultation then treat as a life-threatening attack.

⇒ Review the patient's conditions every 15-20 minutes to adjust the treatment.

TABLE 1: Use this table to decide on the severity of the asthma attack and treat accordingly:

	MODERATE ATTACK	SEVERE ATTACK	LIFE THREATENING ATTACK
<b>Difficulty breathing</b>	When walking	On lying down	Always
<b>Speaking</b>	Normal or saying a few words	Single words (child cannot feed)	Cannot speak (child cannot feed)
<b>Consciousness</b>	Alert but may be anxious	Agitated or very silent and not moving	Sleepy or confused
<b>Wheezing</b>	At the end of breathing out	Loud	Not heard, silent chest
<b>Accessory muscles (in drawing)</b>	No or minimal	Usually	Unusual movement
<b>Respiratory rate / minute</b>	Increased	Adult > 30/min Child > 5yrs > 40/min Child < 5yrs > 50/min	Fast or slow
<b>Pulse rate / Minute</b>	Increased	Adult >120/min Child > 5yrs >120/min Child < 5yrs >140/min	Very fast or slow
<b>Peak flow after treatment* see annex 3</b>	Value is > 70% of normal	Value is 33% - 70% of normal	Value is less than 33% of normal
<b>Oxygen Saturations (if available)</b>	>94%	>94%	<94%

MODERATE ATTACK:	SEVERE ATTACK:	LIFE THREATENING ATTACK:
Depending on improvement likely no IPD admission needed	<b>Admit to IPD</b>	<b>Admit to IPD</b>
No oxygen needed	<b>Oxygen:</b> 5L, decrease according to saturations aim SpO <sub>2</sub> >94%	<b>Oxygen:</b> 10-15L decrease according to saturations, aim SpO <sub>2</sub> >94%
<b>Salbutamol inhaler with spacer:</b> 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*	<b>Salbutamol inhaler with spacer:</b> 10-15 puffs each inhaled separately. Repeat every 10-20 minute in the first hour then every 4 hours <b>OR</b> Adult/>5yr: 5mg; Child <5yr 2.5mg 3 times per hour then every 4 hours as needed until full response*	<b>Salbutamol nebuliser</b> Adult/>5yr: 5mg; Child <5yr: 2.5mg 3 times per hour then every 4 hours as needed until full response*
<b>Prednisolone PO</b> Adult: 40mg OD x 3 days Child: 1mg/kg (max 30mg) x 3 days	<b>Prednisolone PO</b> Adult: 40mg OD x 3-5 days Child: 1mg/kg (max 30mg) x 3-5 days  If vomiting/cannot take PO consider IV <b>hydrocortisone</b>	<b>Hydrocortisone IV</b> Adult: 100mg QID Child: 4mg/kg (max 100mg) QID Switch to PO prednisolone when can take PO  If no improvement consider: <b>Aminophylline IV OR</b> <b>Magnesium IV OR</b> <b>Adrenaline IM</b> (See below for doses)

\*\*Note: only use salbutamol tablet if do not have inhaler or nebuliser\*\*

**\*\*PEAK FLOW:** it is important to use peak flow in an emergency to assess the improvement in the patient, if the patient is too unwell to do it initially then wait for some improvement but do not forget to do it.\*\*

#### \*FULL RESPONSE

- Normal: Peak flow values, RR, HR
- Patient can speak and breath normally
- No agitation/confusion
- Chest auscultation – clear or minimal wheeze
- No more chest indrawing

#### Considerations:

- Evidence suggests that for patients >2yrs old an inhaler with a spacer works as effectively as a nebuliser (although not tested for life threatening asthma)
- If are considering second line therapies then discuss with doctor
- Always deworm patients if you give steroids
- Give hydrocortisone IV if the patient cannot take oral prednisolone.

**TABLE 2: Doses of drugs that may be used in asthma:**

<b>1. SALBUTAMOL</b>  <b>Inhaler:</b> One puff is 100 microgram salbutamol (you can increase the dosage to 10 - 15 puffs every 10 - 20 minutes)  <b>Nebuliser:</b> Adult/>5yr: 5mg; Child <5yr: 2.5mg Repeat 3 times per hour in first hour then every 4 hours  <b>Oral:</b> (only use if inhaled/nebuliser not available)  Adult: 2-4mg TID or QID Child <12yrs: 1-2mg TID  <b>Note:</b> Check not on beta blocker, risk of miscarriage in first 6m of pregnancy	<b>4. AMINOPHYLLINE IV</b>  Never give direct IV: Dilute in D5W or NSS. <b>Note:</b> DO NOT GIVE loading dose if PO aminophylline/theophylline taken in last 48 hours  <b>Adult:</b> Loading Dose 5mg/kg (max 500mg) over 20 minutes Maintenance Dose: 0.5mg/kg/hour  <b>Child:</b> Loading Dose 5mg/kg over 20 minutes Maintenance Dose: 1mg/kg/hour										
<b>2. PREDNISOLONE PO</b>  <b>Oral:</b>  Adult: 40mg OD in the morning x 3-5 days Child: 1mg/kg OD in the morning (max 30mg) x 3-5 days	<b>5. ADRENALINE IM (1:1000 = 1mg/ml):</b>  <table border="0"> <tr> <td>Adult:</td> <td>0.5 – 1ml</td> </tr> <tr> <td>Child:</td> <td>&gt; 12yrs 0.5ml</td> </tr> <tr> <td></td> <td>6 –12yrs 0.25ml</td> </tr> <tr> <td></td> <td>6mths – 6 yrs 0.12ml</td> </tr> <tr> <td></td> <td>&lt; 6mths 0.05ml</td> </tr> </table>	Adult:	0.5 – 1ml	Child:	> 12yrs 0.5ml		6 –12yrs 0.25ml		6mths – 6 yrs 0.12ml		< 6mths 0.05ml
Adult:	0.5 – 1ml										
Child:	> 12yrs 0.5ml										
	6 –12yrs 0.25ml										
	6mths – 6 yrs 0.12ml										
	< 6mths 0.05ml										
<b>3. HYDROCORTISONE IV</b>  Adult: 100mg QID Child: 4mg/kg (max 100mg) QID  Change to PO prednisolone as soon as possible (can also use IV dexamethasone)	<b>6. MAGNESIUM IV (Note: evidence is limited)</b>  Adult: 1.2 - 2g IV over 20 minutes Child: 40mg/kg (max 2g) over 20 minutes										

#### DRUGS SIDE-EFFECTS

- Salbutamol tablets may only be used when inhalers and nebulisers are not available because they have greater side effects and are slower to act.
- Salbutamol often causes tachycardia
- Potassium levels are reduced by salbutamol, steroids and aminophylline and this may lead to levels that can be life threatening. If possible potassium levels should be checked.
- For pregnant women avoid aminophylline.
- 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. (see p.97)



## TREATMENT AFTER DISCHARGE

### Moderate Attack:

- Complete course of **prednisolone** PO for total 3 days.
- If possible should discharge with **salbutamol inhaler** with spacer (2-10 puffs every 4-6 hours) for 3 days, then PRN.
- Consider preventative medication e.g. **budesonide**, oral **theophylline** (discuss with doctor).
- Return to clinic if not better/worse or no more inhaler.
- Follow up 4 weeks or before if inhaler finished.

### Severe Attack:

- Complete course of **prednisolone** PO (total 3-5 days)
- If possible should discharge with **salbutamol inhaler** with spacer (2-10 puffs every 4-6 hours) for 3-7 days, then PRN
- Consider preventative medication e.g. **budesonide**, oral **theophylline** (discuss with doctor).
- Return to clinic if not better/worse or no more inhaler
- Follow up 2-4 weeks or before if inhaler finished.

### Life-threatening attack:

- Complete course of **prednisolone** PO for total 5-10 days
- If possible should discharge with **salbutamol inhaler** with spacer (2-10 puffs every 4-6 hours) for 3-7 days, then PRN
- Consider preventative medication e.g. **budesonide**, oral **theophylline** (discuss with doctor).
- Follow up after 1 week or before 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:

- Health education – if possible avoid precipitants e.g. stay away from animals.
- Do not smoke/ stop smoking, advise people should smoke away from patient e.g. smoke outside house.
- Always carry a salbutamol inhaler in case of attack.
- Seek medical attention early in case of symptoms not being relieved by inhaler e.g. if need >10puff/4 hours.

**Long Term Medical Treatment:** (Discuss with doctor about which preventative medication to use)

### 1. INHALERS

- Types of inhalers:

**Note: Salbutamol ALONE does not prevent asthma symptoms or attacks**

1. **Preventer inhalers** STEROID INHALER e.g. **budesonide** these inhalers should be taken regularly to prevent the symptoms/attacks from happening. Rinse mouth out with water (spit water out, do not swallow) after use to prevent oral candida.
  2. **Reliever inhalers** SALBUTAMOL INHALER e.g. **ventolin** these inhalers should only be used when the patient has symptoms (although sometimes taken regularly for a short time 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 doctor).
  - It is important to educate the patients
    1. How to use inhalers +/- spacer
    2. How many puffs to take how many times a day
    3. When to take each inhalers e.g. budesonide every day vs salbutamol PRN
  - The dose will depend on the response. Need to aim for the lowest dose of steroid inhaler that controls the symptoms.
    - **OPD patient (mild attack) with persistent symptoms:** Low dose steroid inhaler **budesonide** (e.g. 1 puff BID).
    - **Patient discharged from IPD after moderate attack:** Medium dose steroid inhaler **budesonide** (e.g. 2 puffs BID).
    - **Patient discharged from IPD after severe/life threatening attack:** High dose steroid inhaler **budesonide** (e.g. 4 puffs BID).

### 2. THEOPHYLLINE/AMINOPHYLLINE

- Note: oral theophylline is safer than aminophylline
- Discuss with doctor about starting oral aminophylline/theophylline
- Dose depends on the brand of tablet (see specific manufacturer instructions).

**Advice in case of asthma attack at home:**

- Do not lie down
- If acute dyspnoea give salbutamol inhaler 10 puffs
  - If no improvement in 10 minutes: give a second salbutamol inhaler 10 puffs
  - If again no improvement to come to clinic.
- If needing the salbutamol inhaler more than 10 puffs every 4 hours they must come to the clinic.

**FOLLOW UP**

- Follow up in OPD (**check peak flow value**) and reduce dose of inhaler/tablet step by step to the minimum dose that fully controls symptoms. If symptoms come back, increase the dose of steroid inhaler again.
- Review the patient every month or when the steroid inhaler is nearly empty.
- Review inhaler with spacer technique at each follow up appointment.
- Check peak flow value. Increase the dose until the peak flow value is normal.
- Keep the patient at this dose all the time to help control the symptoms.
- 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 bring on an asthma attack/make asthma worse so do not prescribe these drugs

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**TUBERCULOSIS**

**SURVEILLANCE**  
See appendix

**DEFINITION**

Tuberculosis 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**

Pleural  
Lymph nodes (commonly in neck)  
Brain  
Abdomen  
Pericardium (heart)  
Spine, other bones and joints.

**Less common**

Genital tract  
Kidney  
Adrenal gland  
Skin

**SIGNS AND SYMPTOMS****1. Pulmonary TB**

**The most common signs and symptoms of Pulmonary TB are:**

- Cough for more than 2 or 3 weeks (with or without sputum production)
- Fever of unknown cause > 2 weeks
- Weight loss in the past three months
- Drenching night sweat



If there is one or more of the above signs and symptoms, the case should be suspicious of TB and investigation for TB diagnosis is to be carried out.

Other symptoms are:

- Respiratory: coughing up blood, chest pain, breathlessness.
- General symptoms: tiredness, loss of appetite and secondary amenorrhoea
- (see p.217 on managing a suspect case of TB).

### Physical Signs

- The physical signs of pulmonary TB are non-specific and cannot be distinguished from other lung diseases.
- General signs: fever, tachycardia, finger clubbing.
- Respiratory signs: often no abnormal signs in the chest, although you may hear crackles, wheeze or bronchial breath sounds.

## 2. Extrapulmonary TB

TB outside the lungs may present with the following:

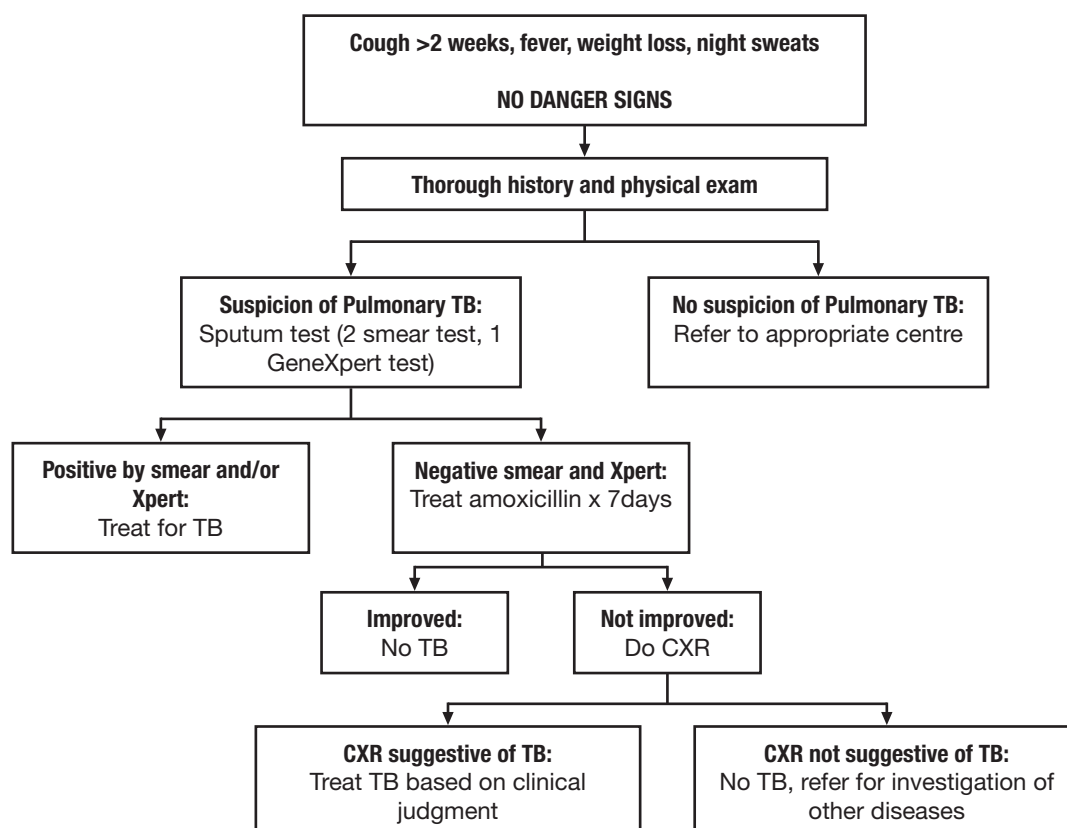
- **TB pleural effusion:** chest pain, dullness on percussion, reduced or no air entry on the affected side.
- **TB lymphadenopathy:** enlargement of lymph nodes, usually in the neck and bilaterally.
- **TB spine or bone:** deformity, chronic bone infection.
- **TB brain:** signs and symptoms of meningitis (headache, neurological deficit, loss of consciousness).
- **TB abdomen:** ascites, abdominal mass.

### DIAGNOSIS

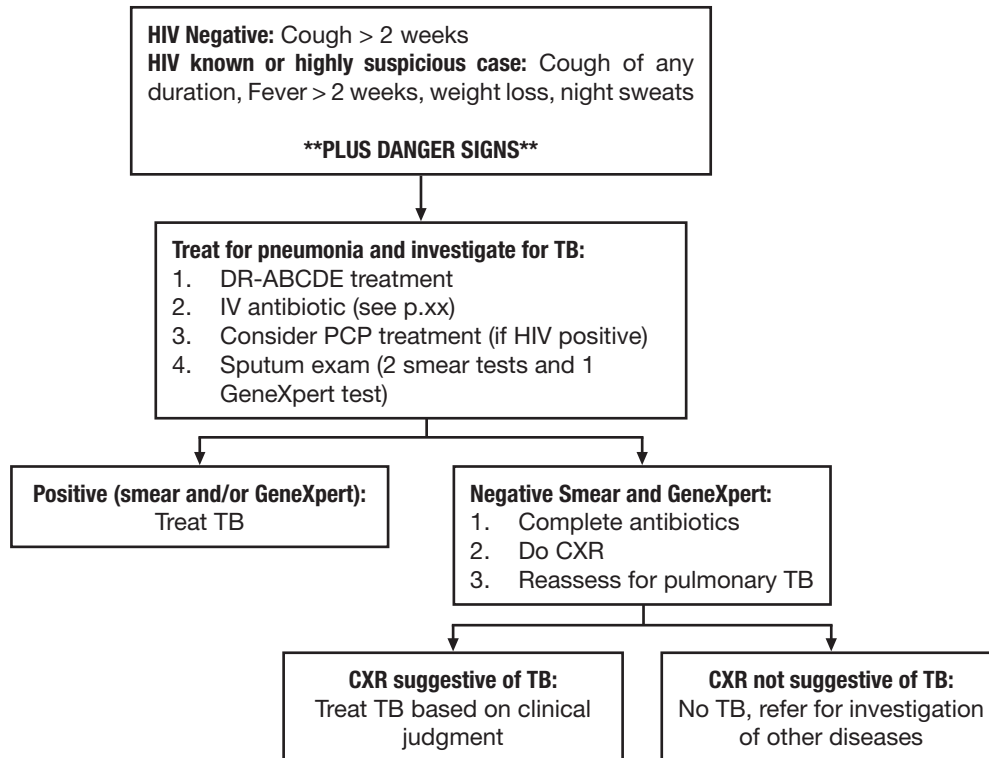
If you suspect a patient has TB you should:

1. **Assess for danger signs**
  - RR > 30/min
  - PR > 120/min
  - Temp > 39°C
  - Unable to walk
2. **Follow the algorithms** below depending on if the patient has danger signs or not

#### Algorithm 1: Managing A Suspect Case of TB WITHOUT DANGER SIGNS (Danger signs: RR>30, PR>120, T>39°C, unable to walk)



**Algorithm 2: Managing A Suspect Case of TB \*\*WITH DANGER SIGNS\*\***  
**(Danger signs: RR>30, PR>120, T>39°C, unable to walk)**



**TESTS USED IN THE DIAGNOSIS OF TB:**

**For Pulmonary TB:**

- 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.
- 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)
- 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
- Chest X-Ray:** useful for smear negative pulmonary TB like pleural effusion, miliary TB, and TB in children
- 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. | 4. Thoracocentesis (pleural tap) and examination of pleural fluid: TB pleural effusion. |
| 2. Chest X-Ray: TB Pleural effusion, TB Pericarditis.          | 5. Lumbar puncture and examination of CSF: TB meningitis.                               |
| 3. Spine and Bone X-Ray: bone and spine TB.                    | 6. Abdominal paracentesis and examination of peritoneal fluid: TB abdomen.              |

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**Note:** Multi-drug resistant TB (MDR TB) is already a public issue in the border area. Therefore it is recommended that diagnosis and treatment of MDR TB should be integrated within a TB program.

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**TREATMENT**

TB can be cured by using effective treatment regimens:

- Daily ingestion of anti-TB drugs without interruption.
- Multi drug therapy (4-5 drugs).
- At least 6-8 months duration of drug therapy.
- 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 REGIMEN:**

The preferred standard short course regimen according to WHO guidelines:

**New Treatment Case – Category I**

	Initial Phase (2 months)	Continuation Phase (4+ months)
Sputum (+)ve Sputum (-)ve 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

*H = isoniazid, R = rifampicin, Z = pyrazinamide, E = ethambutol*

(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 (+)ve, Sputum (-)ve, 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	5 HRZE x 5 months

*S = streptomycin, H = isoniazid, R = rifampicin, Z = pyrazinamide, E = ethambutol*

(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**

**Note:** 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**

- o Patients should avoid getting pregnant during treatment (see family planning p.69).
- o Rifampicin makes oral contraceptive pills less effective. Use other form of contraceptives e.g. injection Depo-Provera.
- o If pregnant: streptomycin is contra-indicated as it can cause deafness to the baby. Use ethambutol instead.

**PREVENTION & VACCINE****1. BCG Vaccination for children**

- o Routine vaccination to all infants in an area with high TB prevalence is recommended:
- o It protects against severe forms of TB such as meningitis, miliary TB in infants.
- o Vaccination lasts for 15 years in well-nourished children.
- o It is safe to give in HIV infected children **but** is contraindicated in active AIDS

**2. Maintaining Good Hygienic Practices**

- o Always cover mouth and nose with a tissue or handkerchief when coughing or sneezing.
- o Keep doors and windows open during the day to provide ventilation and sunlight exposure.
- o Spit only into a container.
- o Proper disposal of excreta (sputum, saliva) from TB patients (burning, dumping in a pit).
- o Keep good personal hygiene – regularly wash hands, take showers, wash hair, wear clean clothing, cut nails.

**3. Improve Fitness**

- o Enough sleep, healthy diet, physical exercise. Do not smoke.

**DRUG SIDE EFFECTS****Approach to drug side effects:**

1. Identify responsible drugs.
2. Rule out other possible cause e.g. scabies for itchiness, viral hepatitis for jaundice.
3. Evaluate risk of side effects versus the consequences of treatment interruption.
4. 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.
5. Most minor side effects are resolved within 2-3 weeks.

Specific side effects are shown in the table below:

SIDE EFFECTS	RESPONSIBLE AGENT	INTERVENTION
<b>Orange-red urine</b>	Rifampicin	Explanation and encouragement, no harm, normal staining from drug
<b>Peripheral neuropathy</b> (early symptoms: paraesthesia, followed by prickling and burning sensation in feet, later in hands)	Isoniazid	Prevention by taking <b>vitamin B6 (pyridoxine)</b> 10mg OD prophylaxis. Treatment – 100-200mg of vitamin B6 daily (high dose may reduce the effectiveness of isoniazid)
<b>Hepatitis (Jaundice)</b>	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
<b>Impaired vision (Eye)</b> (Early signs and symptoms - blurred vision, reduction of 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.
<b>Vestibulo-ototoxicity (Ear)</b> (At early stage: dizziness, vertigo, ear ringing) and <b>renal toxicity</b>	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.
<b>Skin manifestation</b> or generalised hypersensitivity	All agents in descending order: 1. Streptomycin 2. Ethambutol 3. Pyrazinamide 4. Rifampicin 5. Isoniazid	<b>Minor</b> (itchiness and rash): symptomatic treatment with <b>chlorpheniramine</b> and Calamine lotion <b>Severe Steven Johnson Syndrome</b> (fever rash, muco-cutaneous eruptions): stop treatment. Start re-introductory schedule when the symptoms are resolved.

<b>Joint pain</b>	Pyrazinamide	Symptomatic treatment with <b>paracetamol</b> (or with <b>ibuprofen</b> if not better with paracetamol alone), usually resolves after two weeks
<b>Gastrointestinal upset</b> (nausea, vomiting and abdominal pain)	Rifampicin	Give after small meal Symptomatic treatment: <b>omeprazole</b> or <b>metoclopramide</b> . Administer 2 hours before or 3 hours after TB medication
<b>Shock, purpura, acute renal failure</b>	Rifampicin	Stop rifampicin. Never reintroduce rifampicin again.

#### EXAMPLES OF NUMBER OF TABLETS OF ANTI-TB DRUGS ACCORDING TO WEIGHT BAND

**TABLE 1. Sample regimens (Category I) with separate anti-tuberculosis drugs in Adults**

	Weight in Kg			
	30-39	40-54	55-70	>70
<b>Initial Phase – Daily</b>				
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
<b>Continuation Phase – Daily</b>				
H 100mg	1.5	2.5	3	3.5
R 150mg	2	3	4	5

**TABLE 2. 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

**TABLE 3. 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



## CHAPTER 25: SKIN DISEASES

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 the patient's job and allergy history.

### 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)

### IMPETIGO

See photo p. 299

### 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 around a bite or a scratch. Rash can increase over days to weeks. The lesions are red, round, flattish, with golden coloured crust 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,
- Treat contacts.
- Wash clothing and towels daily until infection is resolved.

**LOCALISED IMPETIGO**

**Note:** If the child 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 (for example gentian violet, povidone, savlon, or chlorhexidine) 2 times per day and dry. Use gentian violet if impetigo is near mucous membranes (eyes, mouth).
- Gently remove the crust after softening them with Vaseline
- Keep dry (if on the buttocks of children, leave them uncovered).
- Cut the fingernails, shave the head if necessary (if a lot of lesions on the head).

**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** (see p.223)  
(if allergic to penicillin: **erythromycin** (see p.223))
- Incise abscesses.

**ABSCESS**

See photo p.299

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 enlarged lymph nodes. Antibiotics cannot reach the abscess cavity very well so the treatment is to cut open the abscess to allow the pus to drain out (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**) (see p.223 for doses) if the patient also has:
  - Cellulitis (see below).
  - 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 e.g. contaminated with soil then consider adding **metronidazole**

**SECOND STAGE:** very painful. One point on the skin (exactly 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. Only 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.



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Avoid manipulating an abscess in the face due to the risk of cavernous sinus thrombosis (blood clot in the base of the brain) – treat such cases as severe, with high dose IV antibiotics.

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## CELLULITIS AND ERYSIPELAS

See photo p.299

### DEFINITION

This is a spreading acute bacterial infection under the skin, with redness, swelling (not localised like an abscess) and pain, with local lymph gland enlargement. The borders of the infection are not very well defined for cellulitis, but for erysipelas there may be clear borders. There can be high fever, chills and rigors, especially for erysipelas. *Streptococcus pyogenes* and *Staphylococcus aureus* are the most common causes. 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.

**Note:** If the cellulitis causes deep ulcers very quickly (within a week), this could be “**necrotizing fasciitis**”, caused by many organisms including *group A Streptococcus* (*group A strep*), *Klebsiella*, *Clostridium*, *E. coli*, *Staphylococcus aureus*.

---

**The risk of cellulitis is septicaemia (when the bacteria spread into the blood) - to prevent septicaemia it is important to diagnose early and start antibiotic treatment**

---

### TREATMENT

- Immobilisation and elevation of the limb (higher than the heart).
- Cool and wet dressing.
- **Do not cut open.**
- Give ibuprofen for pain and inflammation
- Give antibiotics:

#### **1. Mild cases**

- o **Cloxacillin** PO x 7 days (see p.223) and follow up regularly
- o If penicillin allergic use **erythromycin** PO (see p.223)
- If **no improvement** after 3 days, or the patient is getting worse: admit to IPD, and change to severe case.

#### **2. Severe cases:** high fever, patient unwell.

- Admit to **IPD**, do blood culture
- Start intravenous antibiotics:
  - o **Cloxacillin** IV Adult: 1g QID; Child >1mth: 50mg/kg QID (max 1g QID)
- AND**
- o **Benzyl penicillin** IV Adult: 1.2g QID; Child >1mth: 25mg/kg QID
- If no improvement after 48 hours or patient's condition is getting worse, add **gentamicin** OD (4mg/kg neonates; 5-7mg/kg in children and adults) for 3-5 days.

#### **3. Suspect necrotizing fasciitis**

- Consider referral – patient may need surgery that is not available in many clinics.
- Remove all necrotic tissue and clean with normal saline 1-2 times daily.
- Cover with wet gauze (use normal saline) and then wrap around with dry gauze
- Treat with IV **cloxacillin** as per severe cellulitis. If available can use **clindamycin** IV Adult: 600mg - 2.7g daily in 2-4 divided doses; Child 10mg/kg (max 1.2g) QID or **clindamycin** PO Adult: 450mg QID; Child: 6mg/kg (max 450mg) QID. Clindamycin provides bacterial anti-toxin effect and will help the infection. Use antibiotics until the ulcers are improving and no more cleaning is needed.

## 25.2 FUNGAL SKIN INFECTIONS

### CANDIDA

See photo p.299

#### DEFINITION

Fungal infection of the skin or mucous membranes, sometimes also called 'thrush'. 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 (p.44 and 193). Oral candidiasis is common in neonates or elderly but unusual for other ages. If find oral candidiasis in other age groups then consider immunosuppression e.g. HIV, cancer.

#### SIGNS AND SYMPTOMS

- Oral Candidiasis: removable white spots in the mouth, painful and difficult swallowing.
- Vaginal Candidiasis: see p.193

#### TREATMENT

##### **Oral Thrush**

- **Nystatin 400,000 IU/day** – give 1 lozenge to be sucked QID for 7 days or 1ml of oral suspension (100,000 IU) QID for 7 days. Oral suspension should be swilled around oral cavity and swallowed. For treatment in HIV/AIDS patients, see p.123.

##### **Vaginal Candidiasis**

- See p.193

### RINGWORM

See photo p.299

#### 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:**

- 2 times per day clean with soap and water, dry and apply ketoconazole 2% cream BID for 2 weeks or longer if necessary.
- Other topical antifungals can also be used, such as clotrimazole, miconazole, or whitfield ointment.

##### **Scalp ringworm:**

- If on head shave head or cut hair short
- Treat secondary infection first
- If scalp ringworm: need to also give oral antifungals
  - e.g. **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 (1g OD if severe infection)
  - Contraindicated in pregnant women

**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 available.

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If there is no improvement, make sure it is not leprosy (see p. 299)

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## 25.3 VIRAL SKIN INFECTIONS

### HERPES SIMPLEX

See photo p. 299

#### DEFINITION

Recurrent infection of skin and mucous membranes due to infection with *Herpes Simplex Virus*. After the first infection, the virus stays in the body and can recur if the person has another illness, is stressed or exposed to cold or sunlight. The infection always happens in the same place. 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, but they will often recur.

#### 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.
- In the 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 causing keratitis and blindness (see *eye infection p.62*).

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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.

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#### TREATMENT

##### **Mild/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 per day for minimum 5 days, given **in the first 48 hours of symptoms starting**

##### 1. On the skin

- Clean lesions with **savlon** (antiseptic cream) and let dry.
- Apply **GV** (can be used on mucous membranes)

##### 2. In the mouth:

- Wash the mouth with warm salty water.
- **GV**, 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 doctor for consultation.

##### 4. On the genitals: (see *STI p.195*).

- Wash with soap and water. Give paracetamol for pain. Condoms help prevent the spread of herpes.
- 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. Refer to doctor.

**For eczema herpeticum see eczema p.231**

### VARICELLA ZOSTER

See photo p.299

#### **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.
- Whole body: more on the trunk and less on the arms and legs.

**TREATMENT**

- Clean with water and soap.
- Cut the fingernails, to reduce damage from scratching.
- Apply **GV** only on infected spots. Secondary infections: antibiotic treatment (see p.223).
- 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 **Terramycine Eye Ointment**.

**HERPES ZOSTER (SHINGLES)****DEFINITION**

A rash caused by the reactivation of the chickenpox virus. It occurs to people that have previously had chickenpox. After you recover from chickenpox, some of the virus (varicella zoster) stays in the body in an inactivated form 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.119). More common in adults than children.

**SIGNS AND SYMPTOMS**

- Often fever and chills a few days before the rash develops. Feeling unwell.
- Moderate to severe pain at the site where the rash will develop. Pain may come before you can see the rash.
- 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 is distinctive because it appears in the **area of the affected nerve (dermatome), therefore it is usually only on one side of the body**, very often on the chest but it can be found anywhere on the skin or mucosa (depending on the affected nerve).

**TREATMENT**

- Treat lesions as for Herpes Simplex.
- Apply cold compresses.
- Follow pain protocol (see p.28).
- Consider **amitriptyline** if pain is not relieved 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 given in the first 48 hours after eruption of lesions.

**Mild/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 per day for minimum 5 days, given **in the first 48 hours** after eruption of lesions.

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**Note:** The patient is infectious to people who have not had chicken pox. This is especially important for contact with pregnant women – **advise them to stay away from pregnant women who have never had chickenpox**

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**25.4 PARASITIC SKIN INFECTIONS****SCABIES**

See photo p. 299

**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) can be found 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 (see p.223) and then the scabies.

**Note:** There is a severe form 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**.
- **Ideally use permethrin** as have to apply for less time, only need to apply once, and does not need diluted in children.

**Medication**

1. **5% Permethrin lotion** for child >2m and adults (does not need dilution)
    - o **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.)
  2. **25% Benzyl benzoate** Use if <2m or permethrin not available (needs diluted)
    - o Child < 2 yrs – 1 part 25% lotion + 3 parts water apply for 12 hrs (or if <6 mths for 6 hrs) then rinse
    - o Child 2-12 yrs – 1 part 25% lotion + 1 part water, apply for 24 hrs then rinse off
    - o Child >12 yrs/adults – undiluted 25% lotion, apply for 24 hrs then rinse off
    - o REPEAT application after 24hrs
- 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 bag
  - Educate 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

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If no response after treatment make sure that the treatment has been applied properly and that all members of the family have been treated.

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**CUTANEOUS LARVA MIGRANS (HOOKWORM INFECTION)**

See photo p. 299

**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. (**Note:** if >6m but <10kg give 200mg STAT)

**PREVENTION**

Wearing shoes or sandals.

**LARVA CURRENS (STRONGYLOIDES INFECTION)**

See photo p. 299

**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**

**Ivermectin** is the ideal treatment but is not available. Instead use **Albendazole** Adult/Child >6m: 400mg OD for 3 days.

(Note: if >6m but <10kg give 200mg OD)

**PREVENTION**

Wearing shoes or sandals.

## 25.5 NON-INFECTIVE SKIN RASH

### URTICARIA (ALLERGIC RASH)

See photo p. 299

**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

**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.

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**In case of oedema of the face or difficulty breathing/wheeze follow DR-ABCDE anaphylactic shock protocol p.14**

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### ECZEMA

See photo p. 299

**DEFINITION**

Non-specific inflammatory skin reaction to special factors.

**SIGNS AND SYMPTOMS**

- Red, scaly/dry, itchy lesions
- Anywhere on the body, usually on both sides of the body (especially at the front of the elbows and behind the knees where the joint bends (flexure areas)).
- It may be localised or widespread, dry or wet but usually long lasting.
- The dry lesions are very itchy and there is serous (like water) exudation, there may be vesicles.
- It can appear and disappear many times at the same place.
- Chronic eczema can cause thickening of the skin (lichenification)
- Secondary infections are common.
- Eczema can look very similar to ringworm, especially on the face.

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If infected, treat the infection with antibiotics first (see p.223) and then the eczema

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TREATMENT

- **Do not** scratch; cut nails, try socks over the hands at night to prevent unconscious scratching.
  - Wash only with water: do not use soap on affected areas. **Do not** scrub with water
  - Advise cotton clothing.
  - Look for and treat any other skin disease e.g. scabies, secondary bacterial infection
  - Rinse clothes very well, so that no soap stays on.
1. **Mild:** areas of dry skin sometimes itchy, may have small areas of redness
    - o **Vaseline**/ white soft paraffin apply QID (advise to protect skin from sun when using vaseline)
    - o **+/- chlorpheniramine** if very itchy
  2. **Moderate:** dry skin, red patches with scratch marks, may have small areas of skin thickening
    - o **Vaseline**/ white soft paraffin apply QID (advise to protect skin from sun when using vaseline)
    - o **+/- chlorpheniramine** if very itchy
    - o **Hydrocortisone 1% cream (mild steroid)** **Note:** 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 face and any areas of broken skin
      - If really need to use for long time then consider alternate days or weekly.
  3. **Severe:** large areas of dry skin, constant itching, red, may be bleeding/weeping/infected, large areas of thickened skin.
    - o As for moderate eczema
    - o Can also consider using **triamcinolone (moderate steroid)**
    - o If very severe and above treatment doesn't work can consider **PO prednisolone 0.5mg/kg/day**.

Steroid creams are of different strengths: **hydrocortisone** is mild, **triamcinolone** is moderate, **betamethasone** is high strength. Be careful when applying strong steroid creams for a long time as it can damage the skin. Use the weakest cream that you can for the shortest time possible.

COMPLICATION**Eczema herpeticum**

- Is a serious infection with herpes virus when the virus affects the body.
- It is 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.

**PSORIASIS**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, 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:

1. **Plaque psoriasis:** lesions on extensor surfaces.
2. **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. Consider **hydrocortisone** cream if not improving or if acute flare up (see information above about steroid cream).
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

See photo p. 299

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.
- **Both skin changes AND nerve signs** (enlargement of nerve, reduced feeling or loss of movement). A pale or discoloured skin patch with reduced feeling and an enlarged nerve is very 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 over conjunctiva (front surface of eye). The patient is not able to close the eye (lagophthalmos), the lower eye lid turns out (ectropion). Eyebrow loss, eyelashes thin and turn in (entropion). Dry eyes, conjunctivitis, corneal damage, iritis (inflammation of the iris), blindness.

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If your area has a leprosy control programme, refer any suspected patient for diagnosis and management

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### History

Short duration (3 weeks or less), and itching make the diagnosis less likely.

### Physical examination

1. Check the patient's **entire 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 - over 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 - in the neck, 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, the patient will need to be referred to a special leprosy programme for diagnosis and treatment\*\***

Below is an overview of the treatment that would be undertaken in the specialist centre/hospital.

### DIAGNOSIS

Diagnosis is confirmed by finding the bacteria in:

1. Split skin smear test- scraping of skin from 2-4 areas with lesions and 2 normal areas of skin (normally ear lobes), and sent on a slide for Ziehl Neelsen (ZN) and AFB testing. This is often only done in specialist clinics/ hospitals.
2. Nasal swab

Even if the skin and nose smears are negative, a patient can still have leprosy. Therefore diagnosis of leprosy relies on clinical signs and symptoms in cases when split skin/nasal swab smear is negative. Thorough clinical examination is important.

### TREATMENT (if not available, refer for treatment)

Medical treatment with drugs is the best way to help patients with leprosy. It is easy to treat the infection, but nerve damage will never go away. **Early recognition and effective treatment prevents from deformity and disability.** It is important to diagnose and start treatment early, to prevent nerve damage. Multiple drug treatment (MDT) is used in the medical treatment of leprosy in order to prevent development of drug resistance. Taking the drugs regularly with correct dosages and until completion of the defined treatment duration is very important in order to prevent drug resistance as well as to prevent from reappearance (relapse) of the disease. Treatment regimen varies depending on the clinical staging of the disease (by World Health Organisation (WHO)) as below.

#### WHO STAGING:

Stage	Characteristics	Treatment regimen (dosage for adult)
Multibacillary leprosy	> 5 skin lesions	<b>Rifampicin</b> 600mg once/month x 12 months <b>AND</b> <b>Clofazimine</b> 50mg OD daily + 300mg once/month x 12 months
Paucibacillary leprosy	2-5 skin lesions	<b>Rifampicin</b> 600mg once/month x 6 months <b>AND</b> <b>Dapsone</b> 100mg OD daily x 6 months
Single skin lesion paucibacillary leprosy	Single skin lesion	<b>Rifampicin</b> 600mg STAT <b>AND</b> <b>Ofloxacin</b> 400mg STAT <b>AND</b> <b>Minocycline</b> 100mg STAT (single dose of each)

#### Drug side-effects:

- Dapsone can produce haemolytic anaemia and G6PD activity should be tested before giving. Dapsone should be used under close supervision or avoided if G6PD-deficient patients.
- Dapsone may cause skin rash/skin reaction, sometimes severe.
- Clofazimine turns the skin dry or reddish /brown. Skin discoloration fades slowly when the drug treatment is finished. Vaseline or vegetable oil can be applied to relieve from skin dryness.
- Ethionamide or prothionamide are alternatives to clofazimine and may cause liver problems.
- Rifampicin turns urine reddish colour. This does not cause any harm.

#### Acute medical emergencies in leprosy include:

1. **Severe reaction with sudden onset**, usually whilst on treatment, due to a strengthening of immunity reaction causing new nerve or skin damage and presenting with:
  - a) rapid nerve swelling with pain and tenderness.
  - b) sudden loss of motor function (wrist drop, foot drop, facial palsy).
  - c) 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**, due to weakening of immunity, with increasing new skin lesions and change in old lesions to become more 'lepromatous' (uniform, thick, extensive, nodular) in nature.

**TREATMENT:** Restart anti-leprosy drugs in proper dosage and use prednisolone.

**PREVENTION** of damage to feet, hands and eyes that have lost sensation is very important.

- Use shoes with strong bottom sole (like car tyre rubber) to protect against trauma from walking.
- Gloves can help to protect hands during manual work and cooking.
- Plain glasses or goggles can help to protect eyes without sensation.
- Joint stiffness can be prevented by gentle rotation of affected joints every day.

#### **EDUCATION**

Educate patients how to prevent injury to numb hands, feet and eyes. Rest is the best, but is often not possible. Every day, the patient should check the numb area for trauma and come to the clinic if there is any wound. Be careful to avoid burns.

#### **REHABILITATION**

Surgery and physiotherapy are important for management of ulcers and bone and muscle deformities of the hands, feet and face. Many paralysed muscles can be helped by reconstructive surgery. It is important to emphasise that surgery and drugs cannot improve lost sensation. Organisations such as Handicap International may be able to help and referral should be considered.

#### **IMPORTANT POINTS FOR LEPROSY**

- Early detection, and treatment of the disease.
- Early recognition and adequate treatment of complications.
- Patient education in self-care.

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**Note:** Many people with leprosy become depressed by how they are treated by other people.

It is important to recognize 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.

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## **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.

1. **Always take general precautions** for you and the patient e.g. gloves
2. **Remove any old dressing**
3. **Examine the wound**
  - a. **Look at the colour**
  - b. **Look for infection** – consider antibiotics if the wound looks infected/signs of systemic infection
4. **Clean the wound** – clean with polyvidone iodine solution and sterile water or normal saline and rinse.
5. **Explore the wound** – use local anaesthetic **1% lidocaine** and wait for 2 minutes, look for foreign bodies.
6. **Tetanus prevention**
7. **Assess for sensation, function and blood supply** to the limb
8. **Excision of the wound** – remove non-viable tissue
9. **Suturing** – consider immediate or delayed suturing
10. **Dressing**
11. **Consider complications**

#### **DETAIL OF TREATMENT**

It is very important to follow these steps:

##### **1. General precautions**

- Make sure you explain the procedure to the patient.
- Always wear protective equipment e.g. gloves.
- Always have someone to help you.
- Try to be as sterile as possible, clean equipment between patients.
- Always go from clean to dirty e.g. if multiple wounds start with the cleaner wounds.
- Always give painkillers before examining wound, wait for enough time to allow the medication to work.
- Discard of all sharps in the sharps containers.
- If wounds are more than 6 hours or contaminated then delay suturing.
- 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.223).
- Discard the dressing and non-sterile gloves in the correct place.

## 3. Examine the wound

### 1. Look at the colour

- Black area = necrosis, wet or dry infected eschar (be careful to distinguish from dark red old blood and black).
- Yellow/green area = infected tissue/pus.
- Red area = granulation – usually a sign of healing (but red edges = inflammation or infection). If the granulation tissue is heaped up higher than the edges of the normal skin, you should dress the wound with some pressure to push down the granulation tissue. This will allow the normal skin edges to grow over the granulation tissue.
- Pink area = epithelisation, final stages of wound healing.

### 2. Look for infection

If the wound is sutured and you see the following signs then there is an infection and you should remove one or more of the sutures and assess for general signs of infection e.g. fever:

- 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 you think the wound is infected (or it is a high risk wound (see below)) treat with **cloxacillin** (see cellulitis p.223). 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 sterile gloves if available, otherwise use a new pair of non-sterile gloves.
- Clean according to what the wound looks like:
  - o **Clean sutured or clean 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.
  - o **Necrotic or infected open wounds** – 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 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

- Make sure the patient can still move and feel the affected area, and that the skin is pink, not cold and cap refill is <2 seconds.
- If there is any abnormality discuss with the doctor. If the wound is severe then the patient may need an amputation which may not be available at the clinic, 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 is less than 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

- **Clean sutured or clean open wound**: re-cover a wound with sterile gauze and bandage.
- **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**

1. Foreign body (from the trauma or from gauze packing) can delay healing and make the wound worse. If the wound is not healing, inspect wound inside for foreign bodies. May need to do incision to inspect deep wounds.
2. Granulation tissue grows faster than surrounding skin, and the skin edges cannot grow over the heaping granulation tissue. Use skin grafting over the granulated tissue. If skin graft is not available, use moderate pressure dressing to push down the granulation tissue and this will allow skin edges to cover the large wound or ulcer. It can be many weeks of daily dressing changes until the wound is completely healed.

**TETANUS PREVENTION**

RISK	PATIENT VACCINATION COMPLETE			PATIENT VACCINATION NOT COMPLETE
	Last booster was:			(< 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  
Consider adding ciprofloxacin Adult: 500mg BID; Child 7.5mg/kg BID x 5-7 days if the wound was exposed to soil (e.g. wounds on the feet, wound caused by wood or bamboo), or if there is no improvement with cloxacillin.

Booster: **Tetanus toxoid vaccine** 0.5 ml IM into upper arm or buttock

Serotherapy: Adults and children: **250 units Tetanus Immune Globulin (TIG)** 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 **500 units Tetanus Immune Globulin (TIG)**

**Note:** Inject the vaccine and the immunoglobulin in two different sites using separate syringes for each.

**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 and lemma the location of the burn

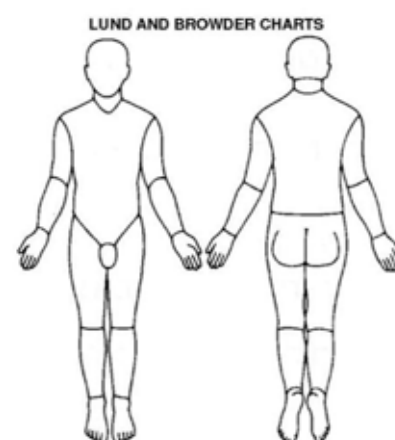
**Note:** Burns are more severe when on the face, hands, joints and perineum.

3. **Size** of the burn:

To calculate the amount of burned skin (% body surface area) use following table:

**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



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 and perineum. Skin is intact (maybe with vesicles).
- Area: partial thickness less than 10% children, 15% adults; full thickness less than 2%.

### SEVERE BURN (ALWAYS ADMIT TO IPD)

- Burns on face, neck, hands, 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 ABCDE assessment and treatment (see p.12) should be done. You should ALWAYS assess for everything and TREAT any abnormality BEFORE moving to the next step\*\*

	ASSESS FOR	TREATMENTS LIKELY TO BE NEEDED FOR <b>SHOCK DUE TO BURNS</b>
<b>DR</b>	Danger Response	Gloves Safe place, call for help
<b>A</b>	Airway obstruction Speaking, stridor, swelling, secretions	Simple airway manoeuvres +/- airway if needed Suction if needed (and available) <b>Oxygen (high flow) if any signs of smoke inhalation</b>
<b>B</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)
<b>C</b>	HR, BP, Cap refill Urine output, Temp Listen to HS	<b>Put in 2 biggest (16G or 18G) IV cannula – take bloods e.g. Hct, CBC, MS, BC, dextrose etc.</b> <b>If signs of shock give fluid bolus NSS or R/L if diarrhoea</b>
<b>D</b>	Check dextrose Any drugs needed e.g. antibiotics, paracetamol	Give <b>analgesia</b> e.g. paracetamol, tramadol Give dextrose if low
<b>E</b>	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
<b>DISCUSS WITH DOCTOR</b>		
<b>ASSESS RESPONSE – Re-start ABCDE assessment</b>		

**Note: Consider referral if burn is:**

1. >10% in size
2. Involves the face, genitalia or joints
3. Is all the way around a limb e.g. circle around the arm
4. Electrical burn
5. Signs of smoke inhalation
6. 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 %BSA (body surface area) 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 48HOURS:****Fluid Resuscitation**

	<b>Less than 12yrs</b>	<b>12 years or more</b>
<b>0-8 hrs</b>	2ml/kg x % BSA of RL + maintenance fluid per hour for 8 hrs	2ml/kg x % BSA of RL
<b>8-24 hrs</b>	2ml/kg x % BSA of RL + maintenance fluid per hour for 16 hrs	2ml/kg x % BSA of RL
<b>24-48 hrs</b>	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 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 and disability in the future. This is most important when burns cover joints (e.g. fingers, wrist, shoulder, knees, toes). If possible can consider referral 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.
- 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 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 48 hours 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.







### Medication handbook – MTC 2014

#### Introduction to the handbook

- ✓ This medication handbook was developed in August 2014, to help improve patient management at MTC.
- ✓ 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
<b>E</b>	<b>Essential drug at MTC</b>	<b>Available at the clinic</b>	<b>Commonly use at the MTC, according to protocols</b>
<b>C</b>	<b>Controlled drug</b>	<b>Available at the clinic</b>	<b>Controlled in MTC +/- in Thailand</b>
<b>S</b>	<b>Special drug</b>	<b>Available at the clinic +/- need to order when need</b>	<b>Use case by case with supervisor approval</b>
<b>i</b>	<b>Information</b>	<b>Not available at the clinic +/- Partner supply some of those drug</b>	<b>On WHO/MSF essential drug list</b>
<b>*</b>	<b>Other</b>	<b>Available at the clinic</b>	<b>Not on WHO/MSF essential list</b>

- ✓ 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
  - Contraindications
  - 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**

<b>PO</b>	Oral	<b>mcg</b>	Microgram
<b>IM</b>	Intramuscular	<b>mg</b>	Milligram
<b>IV</b>	Intravenous	<b>g</b>	Gram
<b>SC</b>	Subcutaneous	<b>kg</b>	Kilogram
<b>PR</b>	Per rectum	<b>IU</b>	International Units
<b>PV</b>	Per vagina	<b>Max</b>	Maximum
<b>BID</b>	2 times/day = every 12 hours	<b>Start</b>	Starting
<b>TID</b>	3 times/day = every 8 hours	<b>HS</b>	“Hora somni”= at bed time
<b>QID</b>	4 times/day = every 6 hours	<b>M IU</b>	Million IU
<b>STAT</b>	One dose only	<b>GI</b>	Gastrointestinal
<b>PPROM</b>	Pre-term prolonged rupture of membrane	<b>IUGR</b>	Intrauterine growth restriction
<b>NA</b>	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 1 <sup>st</sup> trimester	Avoid	Contraindication
Codeine Loratadine Cetirizine Metronidazole	Albendazole Artesunate Carbamazepine Cimetidine Co Artem Hydralazine Mebendazole Nifedipine OPV Praziquantel Pyrantel Pyrazinamide Sodium valproate Warfarin	ABC Acetazolamide Amitriptyline Bisacodyl Chlorpromazine Ciprofloxacin Deferiprone Diazepam Domperidone EFV Fluconazole	Allopurinol Aspirin Benzhexol (Artane) BCG Bromocriptine COC Copper IUD Cyclophosphamide DEC Enalapril Depo Dex-oph DHP Diclofenac Doxycycline
		Fluoxetine Fluphenamine Furosemide Haloperidol Hydrochlorothiazide Isosorbide dinitrate Mefloquine MMR Phenobarbitone Phenytoin Tetracaine	Ergometrine Gliclazide Griseofulvin Ibuprofen Implanon Indomethacin Itraconazole Levodopa Mefenamic acid Podophylline Primaquine Simvastatin Spironolactone Streptomycin

**Note for paediatric**

- ✓ 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)

**Reference**

- BBG 2007
- MIMS Thailand
- BNF 61
- MSF essential drug 2013
- Vidal.fr
- Dorosz 2012

<b>*Anaesthetic and oxygen</b>				
<b>01 +12</b>	<b>Atropine Sulfate Amp 0.6mg/ml</b>	<b>S</b>	<b>Indication</b>	Premedication in anesthesia, bradycardia, spasms of GI tract (bile duct)
			<b>Dosage</b>	0.25-1mg SC or IV (under medical supervision)
			<b>Contraindication</b>	Urethra-prostatic disorders, cardiac disorders, glaucoma, child with high fever
			<b>Side-Effects</b>	Urinary retention, dryness of mouth, constipation, dizziness, headache, dilatation of pupils, tachycardia
			<b>Interactions</b>	With other anticholinergic drugs
			<b>Remarks</b>	Do not mix with other drugs in the same syringe
			<u>Pregnancy</u>	No contraindication
<b>01 +12</b>	<b>Ketamine vial 50mg/ml</b>	<b>j</b>	<b>Indication</b>	Induction and maintenance of general anesthesia
			<b>Dosage</b>	Induction: IV 2mg/kg, IM 10mg/kg ; Maintenance: IV 0.5-1mg/kg, IM 5mg/kg
			<b>Contraindication</b>	Intraocular hypertension, pre-eclampsia
			<b>Side-Effects</b>	Hypertension, hypersalivation, hallucination, apnea
			<b>Interactions</b>	
			<b>Remarks</b>	Respiratory support should be available and ready to use
			<u>Pregnancy</u>	No contraindication
<b>01 +12</b>	<b>Lidocaine (xylocaine) 1%-10mg/ml, 50ml vial 2%-20mg/ml, 50ml vial (for dental)</b>	<b>S</b>	<b>Indication</b>	Local anesthesia for trauma, incision, suturing or procedure for treatment or investigation.
			<b>Dosage</b>	The volume to be injected depends on the surface area to be anesthetized ; Do not exceed: Child: 5mg/kg ; Adult: 200mg IM or SC (1% : 200mg=20ml ; 2% : 200mg=10ml)
			<b>Contraindication</b>	Allergy to lidocaine, impaired cardiac conduction
			<b>Side-Effects</b>	Hypertension, hypersalivation, hallucination, apnea
			<b>Interactions</b>	
			<b>Remarks</b>	Be careful: infected tissue/abscess → risk of spreading the infection If accidentally given IV can cause severe hypotension
			<u>Pregnancy</u>	No contraindication
<b>01 +12</b>	<b>Lidocaine (xylocaine) with Adrenaline (epinephrine) 2% / 1:100000 vial</b>	<b>S</b>	<b>Indication</b>	Local anesthesia for dental procedures, lidocaine combined with adrenaline prolongs anesthesia and reduces bleeding
			<b>Dosage</b>	(see lidocaine)
			<b>Contraindication</b>	(see lidocaine), Never use for the anesthesia of extremities, risk of ischemia and necrosis
			<b>Side-Effects</b>	
			<b>Interactions</b>	
			<b>Remarks</b>	(see lidocaine)

01	Marcaine Spinal (Bupivacaine Hydrochloride)  vial 0.5%	S*	Indication	Intrathecal (subarachnoid) spinal anaesthesia for surgery			
			Dosage	For intrathecal injection: Adult: 10-20mg ; Child: 0.25-0.50mg/kg			
			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.			
01	Oxygen	E	Indication	Acute condition: hypoxemia caused by injury or illness (target level of 94–98%) and in emergency medicine, such as major trauma, anaphylaxis, major hemorrhage, shock Chronic condition: COPD (when SpO2 ≤ 88% ; target level of 88–92%), people with breathlessness, in the setting of end-stage cardiac or respiratory failure			
			Dosage	Oxygen tank or oxygen concentrator. Use pressure regulator & humidifier. Dispense with nasal probe / regular mask / high concentration mask / head-box			
			Contraindication	Smoking/fire around oxygen			
			Side-Effects	Risk of fire hazard and tank explosion: be careful when moving tank			
			Interactions				
			Remarks	Risk of fire hazard and tank explosion: be careful when moving tank			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
			02	*Medicine for pain			
02 +24	Amitriptyline  tab 10mg  tricyclic antidepressant	S	Indication	Neuropathic pain, major depression (2 <sup>nd</sup> line), severe anxiety			
			Dosage	Initial 10-25mg HS. Increase weekly. Maximum 150mg/day (for depression, usually 75mg OD). For 3-6 mths. Child >11yrs start 0.1mg/kg maximum 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	Breast-feeding	Monitor the child for drowsiness	

02	<b>Buthylscopolamine</b> <b>(Buscopan)</b>  <b>tab 10mg</b> <b>amp 20mg/ml</b>	E	<b>Indication</b>	Spasms of GI tract and genitourinary tract			
			<b>Dosage</b>	PO, IM or IV (slow injection/infusion) Child 6-12yrs: 10mg/dose, max TID ; Child >12yrs/ Adult: 10-20mg/dose, max QID			
			<b>Contraindication</b>	Child <6yrs, glaucoma, prostate problem, cardiac disorder			
			<b>Side-Effects</b>	Constipation, heart rhythm problem, urinary urgency and retention, dry mouth, confusion			
			<b>Interactions</b>	Erythromycin, antipsychotics, metoclopramide			
			<b>Remarks</b>	Be careful for old people, hypertension, reflux disease, diarrhea			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
02	<b>Codeine</b>	i	<b>Indication</b>	Moderate pain ; dry & unproductive cough in adult			
			<b>Dosage</b>	Child <12yrs: 0.5-1mg/kg QID ; Adult: 30-60mg QID			
			<b>Contraindication</b>	Acute respiratory depression, asthma attack			
			<b>Side-Effects</b>	Constipation, GI disturbance, dizziness, drowsiness, respiratory depression, hypotension			
			<b>Interactions</b>				
			<b>Remarks</b>	Addiction after prolonged use, withdrawal syndrome, control drug in Thailand			
			<u>Pregnancy</u>	Possible to use, with caution	<u>Breast-feeding</u>	With caution	
02	<b>Diclofenac</b>  <b>tab 25mg</b> <b>tab 50mg</b> <b>amp 25mg/ml</b> <b>amp 75mg/ml</b>  <i>NSAID</i>	E*	<b>Indication</b>	Moderate pain, particularly due to inflammation (acute sciatic neuralgia, renal colic)			
			<b>Dosage</b>	PO: Child: 1mg/kg BID or TID ; Adult: PO 25-50mg TID Take with meal IM 75mg OD			
			<b>Contraindication</b>	Renal or hepatic impairment, severe malnutrition, peptic ulcer, coagulation defects, severe infection, dehydration, allergy to NSAIDs			
			<b>Side-Effects</b>	Epigastric pain, peptic ulcer, haemorrhage, allergic reactions, renal impairment			
			<b>Interactions</b>	Diuretic, other NSAID (do not combine), anticoagulants			
			<b>Remarks</b>	Be careful with asthma			
			<u>Pregnancy</u>	Contraindication	<u>Breast-feeding</u>	Contraindication	
02	<b>Ibuprofen</b>  <b>tab 200mg</b> <b>tab 400mg</b> <b>syrup 100mg</b>  <i>NSAID</i>	S	<b>Indication</b>	Mild to moderate pain (including post-operative period), fever, rheumatic disease			
			<b>Dosage</b>	Child: 2.5-10mg/kg TID ; Adult: 400mg TID-QID ; Take with meal			
			<b>Contraindication</b>	Child <3 mths, Renal or hepatic impairment, severe malnutrition, peptic ulcer, coagulation defects, severe infection, dengue fever, severe heart failure, dehydration, allergy to NSAIDs			
			<b>Side-Effects</b>	Epigastric pain, peptic ulcer, haemorrhage, allergic reactions, renal impairment			
			<b>Interactions</b>	Diuretic, other NSAID (do not combine), anticoagulants			
			<b>Remarks</b>	Be careful with asthma Once opened, oral suspension must be stored between 8°c and 15°c			
			<u>Pregnancy</u>	Contraindication	<u>Breast-feeding</u>	Short term treatment	

02	Indomethacin  tab 25mg  NSAID	E*	Indication	Rheumatic pain ; dysmenorrhea especially pain and heavy bleeding			
			Dosage	50mg TID (maximum dose 200mg per day) ; Take with meal			
			Contraindication	Child <15yrs, renal or hepatic impairment, severe malnutrition, peptic ulcer, coagulation defects, severe infection, severe heart failure, dehydration, allergy to NSAIDs			
			Side-Effects	GI disturbance, headache, allergic reaction, CNS effects including nightmares			
			Interactions	other NSAID (do not combine), anticoagulants, diuretic			
			Remarks	Be careful with asthma			
			<u>Pregnancy</u>	Contraindication	<u>Breast-feeding</u>	Contraindication	
02	Mefenamic Acid  tab 250mg  NSAID	E*	Indication	Rheumatic pain ; dysmenorrhea especially pain and heavy bleeding			
			Dosage	50mg TID (maximum dose 200mg per day) ; Take with meal			
			Contraindication	Child <15yrs, renal or hepatic impairment, severe malnutrition, peptic ulcer, coagulation defects, severe infection, severe heart failure, dehydration, allergy to NSAIDs			
			Side-Effects	GI disturbance, headache, allergic reaction, CNS effects including nightmares			
			Interactions	other NSAID (do not combine), anticoagulants, diuretic			
			Remarks	Be careful with asthma			
			<u>Pregnancy</u>	Contraindication	<u>Breast-feeding</u>	Contraindication	
02	Morphine  Opioid	i	Indication	Severe pain			
			Dosage	No standard dose: follow protocol until efficient pain relief			
			Contraindication	Severe respiratory impairment, nausea, constipation, urine retention, confusion			
			Side-Effects	Withdrawal symptoms, sedation, nausea, constipation			
			Interactions	Alcohol, benzodiazepines, neuroleptics, antihistamines			
			Remarks	Narcotic			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
02 +7	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)			
			Contraindication	IM: Child: 10mg/kg QID ; Adult: 300mg QID			
			Side-Effects	Caution with hepatic impairment			
			Interactions				
			Remarks	No anti-inflammatory properties			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	



02	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			
			Interactions	Any psychotropic drug			
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
03	*Anti-Allergic medicine						
03 +12	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 6y-12y: 0.25ml ; 6m-6yrs: 0.12ml ; <6m: 0.05ml For babies, dilute the dose in NSS to give usable volume Cardiac arrest: slow IV diluted Adult: 1mg ; Child: 0.01mg/kg Severe asthma or croup: nebulization Child <4y: 2.5ml ; Child >4yrs/Adult: 5ml			
			Contraindication	Be careful if diabetes, ischemic heart disease, hypertension, hyperthyroidism			
			Side-Effects	Arrhythmia			
			Interactions	Beta-blockers, tricyclic antidepressants			
			Remarks	Discard any vial with a pink or brownish color			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
03	Chlorpheniramine =Chlorphenamine  tab 4mg syrup 2mg amp 10mg/ml	E	Indication	Minor allergic reactions (contact dermatitis, seasonal allergy, allergy to drugs & food) After anaphylactic shock, give for 2 days oral to prevent relapse			
			Dosage	PO: Adult: 4mg/4-6h (max 24mg/day) ; Child 6-12yrs: 2mg/4-6h (max 12mg/day) ; 3-5yrs: 2mg/4-6h (max 6mg/day) ; 1-2yrs: 1mg BID (max 3mg/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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	



03	Dexamethasone tab 0.5mg amp 4mg/ml  steroid	E	Indication	Anaphylactic shock, severe allergic reaction, Inflammatory syndrome in severe infection ( <i>if on antibiotic treatment</i> ), foetal lung maturation ( <i>risk of premature delivery &lt;34 weeks of gestation</i> )			
			Dosage	IM/slow IV: Adult: 12mg ; Child >30kg: 8mg ; 15-30kg: 5mg ; 8-15kg: 3mg ; <8kg: 1mg <i>Dose and duration vary according to severity and clinical response</i> <i>For fetal lung maturation: administer to the mother 8mg IM TID in 24h</i>			
			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 Dexamethasone 0.75mg ↔ prednisolone 5mg ↔ hydrocortisone 20mg			
			<u>Pregnancy</u>	No contraindication, for short period	<u>Breast-feeding</u>	No contraindication	
03 +18	Hydrocortisone vial 100mg  steroid	E	Indication	Anaphylactic shock, severe allergic reaction, severe acute asthma			
			Dosage	IM/slow IV (dose/4-6h) Adult: 250mg ; Child (2mg/kg) 6-12yr: 100mg ; 1-5yr: 50mg, <1yr: 25mg <i>Duration vary according to severity and clinical response</i>			
			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 Hydrocortisone 20mg ↔ prednisolone 5mg ↔ Dexamethasone 0.75mg			
			<u>Pregnancy</u>	No contraindication, for short period	<u>Breast-feeding</u>	No contraindication	
03 +8	Prednisolone =prednisone tab 5mg  steroid	E	Indication	Allergic & inflammatory diseases/reactions (asthma, nephrotic syndrome, rheumatic fever)			
			Dosage	Adult: 0.5-1.5mg/kg OD ; Child: 1-2mg/kg OD <i>Duration vary according to indication and clinical response</i>			
			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			
			<u>Pregnancy</u>	No contraindication, for short period	<u>Breast-feeding</u>	No contraindication, take after feed	

04	<b>*Antidote</b>						
04	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: Adult: 10ml ; Child <20kg: 0.5ml/kg)			
			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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
05	<b>*Anticonvulsant and antiepileptic</b>						
05 +24	Carbamazepine tab 200mg	C	Indication	Epilepsy (long term treatment), neuropathic pain			
			Dosage	Increase slowly until effective dose: Adult 100mg BID, max 2g/day ; Child 2.5mg/kg BID max 20mg/kg/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			
			<u>Pregnancy</u>	Do not start during first trimester	<u>Breast-feeding</u>	No contraindication	
05 +05 +24	Diazepam tab 5mg amp 10mg/2ml	C	Indication	Convulsion/seizure, agitation and anxiety, muscle spasms, tetanus, pre-procedure			
			Dosage	PO Adult: 5 to 15mg/day ; Child: 0.5mg/kg/day. Slow IV STAT: Adult: 5-10mg ; Child: 0.3mg/kg / Per-rectum (PR) is also possible			
			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 Not a treatment for depression, chronic anxiety or post-traumatic stress syndrome Avoid for neonate unless no other option for convulsion			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Avoid	

05	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: Adult: 1-2g (in NSS) in 20 min infusion ; Child: 40mg/kg			
			Contraindication	Severe renal failure			
			Side-Effects	Overdosage: 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		Breast-feeding	No contraindication
05	Phenobarbital (=phenobarbitone) tab 30mg tab 60mg vial 200mg/ml	C	Indication	Epilepsy (long term treatment), generalized convulsions (if diazepam cannot control) 1 <sup>st</sup> line for neonatal convulsion			
			Dosage	PO: Adult: 60mg HS (max 180mg) ; Child: 5mg/kg HS (max 8mg/kg) IV: Adult: 10mg/kg over 30 min ; Child/Neonate: 10-20mg/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				
			Pregnancy	Avoid		Breast-feeding	Avoid
05	Phenytoin 50mg/ml vial 50mg/ml tab 100mg	C	Indication	Epilepsy (long term treatment), generalized convulsions (if diazepam cannot control) 2 <sup>nd</sup> line for neonatal convulsion			
			Dosage	PO (in 2-3 doses) Adult: 200mg/day (max 500mg/day); Child: 3-8mg/kg/day (max 300mg/day) IV infusion – dilute with NSS: 15mg/kg over 1 hour For Neonate: 20mg/kg over 30 min 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		Breast-feeding	Avoid

05 +24	Sodium Valproate tab 200mg	C	Indication	Epilepsy			
			Dosage	Adult: 200mg TID ; Child: 5mg/kg BID or TID; increase until optimal dose (usually 20-30mg/kg/day)			
			Contraindication	Liver active disease, pancreatitis			
			Side-Effects	dyspepsia, nausea, ataxia, weight gain, low platelets, edema, liver toxicity, sedation, confusion			
			Interactions	Aspirin, chloroquine, mefloquine, tricyclic antidepressant			
			Remarks	If possible monitor LFT and TP during the first 3-6mths of treatment			
			<u>Pregnancy</u>	Don't start during 1 <sup>st</sup> trimester	<u>Breast-feeding</u>	No contraindication	
06	<b>*Anti-infective medicine (b: bacterial, v: viral, p: parasite, f: fungal)</b>						
06b	Amoxicillin tab 250 mg tab 500mg syrup 125mg/5cc  Antibiotic/penicillin	E	Indication	Pneumonia, bronchitis, sinusitis, otitis media, streptococcal tonsillitis (2 <sup>nd</sup> line), dental infection, Helicobacter pylori infection (in combination), leptospirosis Post abortion care			
			Dosage	Adult: 250mg-1g TID ; Child: 10-25mg/kg TID (dose depend if infection mild-moderate or severe)			
			Contraindication	Glandular fever (EBV), Penicillin allergy, be careful if cephalosporin allergy			
			Side-Effects	Allergy, GI disturbance			
			Interactions				
			Remarks	Do not usually give for sore throat ; Do not give any more for UTI (resistance)			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
06b	Amoxicillin/ Clav tab 500/62.5mg tab 500/125mg Syrup 500/62.5mg Syrup 125/31.25mg  Antibiotic/Penicillin	S	Indication	Chronic tonsillitis, animal bite, 2nd line for acute otitis media/sinusitis, severe pneumonia			
			Dosage	Expressed as amoxicillin dose Child < 40kg: 25mg/kg BID (or 15mg/kg TID) ; Adult/ Child >40kg: 1g BID or 500mg TID. Clavulanic acid should not exceed 375mg per day.			
			Contraindication	Penicillin allergy, be careful if cephalosporin allergy, decrease if severe renal failure			
			Side-Effects	Allergy, GI disturbance, jaundice, cholestatic hepatitis			
			Interactions				
			Remarks	Dose ratio varies depending on manufacturer, discuss dose with senior staff			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	

06b	Ampicillin  vial 1g vial 500mg  Antibiotic/Penicillin	E	Indication	Severe infection: septicemia, 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 days: 50mg TID ; Child: 25-50mg/kg QID ; Adult: 500mg-2g QID			
			Contraindication	Penicillin allergy, use cautiously if cephalosporin allergy, glandular fever (EBV)			
			Side-Effects	Allergy, 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 contra-indication	Breast-feeding	No contra-indication	
06b	Azithromycin  tab 250mg  Antibiotic/macrolide	S	Indication	Trachoma, scrub typhus (for child <8yrs and pregnant & breastfeeding women), streptococcal tonsillitis (if penicillin-allergy)			
			Dosage	Adult: 1g STAT ; Child >6mths: 20mg/kg STAT ; if tonsillitis: 500mg OD during 3 days			
			Contraindication	Allergy			
			Side-Effects	Gastrointestinal disturbance, allergic reaction			
			Interactions	Artesunate, aluminium hydroxyde			
			Remarks	Can be used for chancroid, genital Chlamydia trachomatis			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
06b	Benzathine benzylpenicillin (extensilline)  vial 1.2 MIU vial 2.4 million IU  Antibiotic/penicillin	S	Indication	Rheumatic fever, 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			
			Contraindication	Penicillin allergy, be careful if cephalosporin allergy			
			Side-Effects	Allergy			
			Interactions				
			Remarks	Do not give IV – may cause cardiorespiratory arrest.			
			Pregnancy	No contra-indication	Breast-feeding	No contra-indication	
06b	Benzylpenicillin 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			
			Contraindication	Penicillin allergy, be careful if cephalosporin allergy			
			Side-Effects	GI disturbance			
			Interactions				
			Remarks	1 million IU = 600mg			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	

06b	Cefotaxime  vial 500 mg  Antibiotic/ cephalosporin	E	Indication	Neonatal sepsis 2 <sup>nd</sup> line			
			Dosage	<1 week + birth weight <1500g: 50mg/kg BID ; >1 week: 50mg/kg TID ( <i>increase to QID if severe</i> )			
			Contraindication	Cephalosporin allergy, Be careful if penicillin allergy			
			Side-Effects	Allergic reaction, GI disturbance, blood disorder, jaundice			
			Interactions				
			Remarks	if gentamicin contraindicated, use as 1 <sup>st</sup> line			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06b	Ceftriaxone  vial 1g  Antibiotic/ cephalosporin	E	Indication	Severe infection: septicemia, pneumonia, peritonitis/ appendicitis, meningitis, liver abscess, leptospirosis, severe tonsillitis, neonatal sepsis/meningitis, severe acute malnutrition, puerperal fever, septic abortion, PID, typhoid fever, pyelonephritis, gonococcal conjunctivitis, gonorrhea			
			Dosage	Slow IV or IM: Adult: 1-2g OD ; Child: 50-80mg/kg OD (if dose>50mg/kg, give IV only)			
			Contraindication	Neonates with jaundice, Cephalosporin allergy ; Be careful if premature neonates			
			Side-Effects	Allergy, headache, GI disturbance			
			Interactions				
			Remarks	Ceftriaxone should be used as 1st line for severe infection, rather than ampi+genta Once reconstituted, keep solution 1 day at <25°c or 3 days in fridge			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06b	Cephalexin  tab 250mg tab 500mg  Antibiotic/ cephalosporin	E	Indication	Urinary tract infection			
			Dosage	Child: 10mg/kg TID ; Adult: 500mg TID <i>Severe infecton:</i> Child: 15-25mg/kg QID ; Adult: 1g QID			
			Contraindication	Cephalosporin allergy, Be careful if penicillin allergy			
			Side-Effects	Allergy, GI disturbance, blood disorder, jaundice			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06b	Ciprofloxacin  Syrup tab 250mg tab 500mg  Antibiotic/quinolone	E	Indication	Shigellosis, typhoid fever, urinary tract infection, chancroid, cholecystitis, septicemia (Infection due to Gram-negative bacteria)			
			Dosage	Child >1mth: 15mg/kg BID ; Adult: 500mg BID for 3 to 28 days (cf indication)			
			Contraindication	Tendinitis with ciprofloxacin ; Be Careful if epilepsy, G6PD deficiency			
			Side-Effects	GI disturbance, neurological disturbance, arthralgia, myalgia, tendon damage			
			Interactions	Theophylline, co-artemether			
			Remarks	Reduce dose by half if renal failure; drink a lot of liquid during treatment			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	No contraindication	



06b	<b>Cloxacillin</b>  syrup 125mg/ml tab 250mg vial 500mg  <i>Antibiotic/penicillin</i>	E	<b>Indication</b>	Skin infections, septic arthritis, osteomyelitis, otitis externa, severe pneumonia ( <i>in child not responding to 1st line antibiotic</i> ), umbilical sepsis, endocarditis			
			<b>Dosage</b>	PO/IV Adult: 500mg QID, <i>if severe</i> 1-2g QID ; Child: 15mg/kg QID, <i>if severe</i> 50mg/kg QID ; Neonate: <7d & <1.5kg: 25mg/kg BID ; <7d & >1.5kg: 50mg/kg BID, 7-28d: 50mg/kg TID			
			<b>Contraindication</b>	Penicillin allergy			
			<b>Side-Effects</b>	GI disturbance, neonatal jaundice			
			<b>Interactions</b>				
			<b>Remarks</b>	Poor absorption – take 1 hour before or 2 hours after meals. Reduce dose by half if renal impairment			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06b	<b>Cotrimoxazole</b> = Sulfamethoxazole (SMX) + Trimethoprine (TMP)  Syrup tab 400/80mg  <i>Antibiotic/sulfamide</i>	E	<b>Indication</b>	1 <sup>st</sup> line treatment of pneumocystosis (PCP), isosporiasis and brucellosis Prophylaxis of PCP, toxoplasmosis, malaria & bacterial infection for HIV patient			
			<b>Dosage</b>	<i>Treatment of PCP:</i> Child: 100/20mg/kg/day in 2 doses; Adult: 4800/960mg/day in 3 doses <i>Prophylaxis:</i> Child: 50/10mg/kg OD ; Adult: 800/160mg OD, as long as necessary			
			<b>Contraindication</b>	Child <1month, sulfonamide allergy, severe renal or liver failure			
			<b>Side-Effects</b>	Allergy, GI disturbance, blood disorder, neuropathy, photosensitivity, hyperK			
			<b>Interactions</b>	Phenytoin			
			<b>Remarks</b>	Do not use anymore for UTI (resistance) Can store opened syrup for 20 days or 40 days if in fridge			
			<u>Pregnancy</u>	Avoid late pregnancy unless HIV	<u>Breast-feeding</u>	Avoid if baby<1month unless HIV	
06b	<b>Diethyl-carbamazine (D E C)</b>  300mg  Antihelminthic  Store between 15-30c	S	<b>Indication</b>	Child <10yrs: 0.5mg/kg OD, increase over 3 days to 1mg/kg TID ; Adult: 1mg/kg OD, increase over 3 days to 2mg/kg TID then continue for 21 days			
			<b>Dosage</b>	Elderly, infants, pregnancy, breastfeeding, heart or renal disease			
			<b>Contraindication</b>	Fever, myalgia, headache, anorexia, abdominal discomfort			
			<b>Side-Effects</b>				
			<b>Interactions</b>	Phenytoin			
			<b>Remarks</b>	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			
			<u>Pregnancy</u>	Contraindication	<u>Breast-feeding</u>	Not recommended	

06b	Erythromycin Syrup tab 250mg  <i>Antibiotic/macrolide</i>	E	Indication	Use when 1 <sup>st</sup> line treatment not possible (e.g. penicillin-allergy) for pneumonia, otitis, STI including syphilis, leptospirosis, streptococcal skin infection Prophylaxis for PPROM, Diphtheria (treatment and close contact)			
			Dosage	PO: Child: 30-50mg/kg/day ; Adult: 1-2g/day in 2-3 divided dose			
			Contraindication	Allergy to macrolide, do not give with Aminophylline, carbamazepine			
			Side-Effects	Diarrhea, rashes, arrhythmia			
			Interactions	Digoxin, cimetidine, ergometrine			
			Remarks	Use carefully if cardiac disease Take between meals			
			<u>Pregnancy</u>	No contra-indication		<u>Breast-feeding</u>	No contra-indication
06b	Ethambutol ( E )  tab 100mg tab 400mg  HRZE H 75mg, R 150mg, Z 400mg, E 275mg  <i>Antibiotic/Anti-TB</i>	j	Indication	TB (in combination with other anti-TB drugs)			
			Dosage	15-25mg/kg OD ; Reduce dose to 3 times per week if renal impairment HRZE Adult: 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).			
			<u>Pregnancy</u>	No contra-indication		<u>Breast-feeding</u>	No contra-indication
06b	Gentamicin  amp 80mg/2ml  <i>Antibiotic/ Aminoglycoside</i>	E	Indication	Severe infection: endocarditis, septicemia, 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, furosemide, Be Careful: Old people			
			Side-Effects	Ear and kidney toxicity			
			Interactions				
			Remarks	Do not prolong treatment unnecessarily			
			<u>Pregnancy</u>	Avoid		<u>Breast-feeding</u>	No contra-indication
06b	Isoniazide ( H )  tab 100mg tab 300mg  HRZE H 75mg, R 150mg, Z 400mg, E 275mg HR H 150mg-R 300mg  <i>Antibiotic/Anti-TB</i>	I	Indication	TB (in combination with other anti-TB drugs) and TB prophylaxis			
			Dosage	Child <30kg: 5-10mg/kg OD ; Adult: 300mg/day HRZE Adult: 20-34kg: 2tab, 35-39kg: 2.5tab, 40-54kg: 3tab, 55-70kg: 4tab, >70kg: 5tab HR 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			
			<u>Pregnancy</u>	No contra-indication		<u>Breast-feeding</u>	No contraindication, give baby Vit B6 5mg/ day



06b	Meropenem  <i>Antibiotic/ carbapenem</i>	Vial	I	Indication	For severe infection with resistant bacteria (usually hospital acquired)			
				Dosage	Child: 10-20mg/kg TID ; Adult: 0.5-1g TID IV infusion 15-30 min (NSS or D5%, 1g/50ml)			
				Contraindication				
				Side-Effects	GI disturbance, headache, rash, low platelets, seizures			
				Interactions	Sodium Valproate			
				Remarks	For meningitis use double dose			
				<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Avoid	
06b	Metronidazole  Syrup tab 200mg vial 500mg  <i>antibacterial +antiprotozoal</i>		E	Indication	Infection due to anaerobic bacteria, amoebiasis, giardiasis, trichomoniasis and bacterial vaginitis			
				Dosage	PO/IV Child: 7.5mg BID if <1month, TID if >1mths ; Adult: 500-750mg TID for 5-10 days (change IV to PO as soon as possible) For trichomoniasis and bacterial vaginitis: 2g STAT			
				Contraindication	Hyper sensibility 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)			
				<u>Pregnancy</u>	Possible to use	<u>Breast-feeding</u>	Avoid prolonged use	
06b	Nitrofurantoin  tab 100mg  <i>Antibiotic/nitrofurane</i>		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			
				<u>Pregnancy</u>	Not last weeks of pregnancy	<u>Breast-feeding</u>	Avoid	
06b	Norfloxacin  tab 200mg tab 400mg  <i>Antibiotic/quinolone</i>		E*	Indication	Recurrent UTI			
				Dosage	Adult: 400mg BID			
				Contraindication	G6PD deficiency, previous history of tendon damage			
				Side-Effects	GI disturbance, headache, rash, tendon rupture, psychosis, seizures			
				Interactions				
				Remarks	May cause arthropathy in children, use cautiously if history of seizures			
				<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Avoid	

06b	Penicillin V phenoxymethylpenicillin  Syrup tab 250mg  Antibiotic/penicillin	E	Indication	Streptococcal tonsillitis, dental infection prophylaxis after splenectomy and specific situation			
			Dosage	Child: 7.5-15mg/kg QID ; Adult: 250-500mg QID ; <i>Prophylaxis</i> : 500mg BID			
			Contraindication	Penicillin allergy, be careful if cephalosporin allergy			
			Side-Effects	Allergy			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
06b	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	Allergy, pain at injection site			
			Interactions				
			Remarks	100.000UI=100mg ; Be Careful not to give IV Is effective for many infection but not as 1 <sup>st</sup> line			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
06b	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	Child: 20-30mg/kg OD ; Adult: <50kg: 1.5g OD ; >50kg: 2g OD HRZE Adult: 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				
			<u>Pregnancy</u>	Avoid in 1 <sup>st</sup> trimester	<u>Breast-feeding</u>	No contra-indication	
06b	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	<i>Tuberculosis</i> : Child <30kg: 15mg/kg ; Child >30kg/ Adult: 10mg/kg, on empty stomach <i>max 600mg/day ; duration according to protocol</i> HRZE Adult: 20-34kg: 2tab ; 35-39kg: 2.5tab ; 40-54kg: 3tab ; 55-70kg: 4tab ; >70kg: 5tab HR Adult: 21-54kg: 1tab ; 55-70kg: 2tab ; >70kg: 2.5tab <i>Leprosy</i> : (1/month) Child <10y: 12-15mg/kg ; Child 10-14y: 450mg ; Adult: 600mg			
			Contraindication	Jaundice, severe hematological 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 <i>Give vit K prevention in late pregnancy and neonate</i>			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	

06b	Streptomycin ( S )  Antibiotic/ aminoglycosides/ anti-TB	I	Indication	TB (in combination with other anti-TB drugs)			
			Dosage	Child: 15mg/kg Adult: <45yrs→>50kg: 1g OD, <50kg: 750mg OD; 45-60yrs→>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	Breast-feeding	No contra-indication	
06f	Amphotericin B  Vial 50mg  Antifungal  Store between 2-8c	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 hypokalemia, digoxin, NVP, AZT			
			Remarks	Need close monitoring during injection, with prior hydration			
			Pregnancy	late pregnancy, check baby kidney function	Breast-feeding	Avoid except if vital	
06f	Fluconazole  tab 200mg  Antifungal	E	Indication	Oral/oesophageal candidiasis, severe ringworm ; cryptococcal meningitis treatment & prophylaxis (if HIV and CD4 <100),			
			Dosage	PO: Child: 2-4mg/kg OD ; Adult: 100-800mg OD			
			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	Breast-feeding	Avoid	
06f	Griseofulvin  Antifungal	E	Indication	Fungal infection, ringworm			
			Dosage	PO Child: 10-20mg/kg OD ; Adult: 500mg OD ; Take with meal			
			Contraindication	Severe liver disease			
			Side-Effects	Headache, dizziness, blood disorders			
			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	Breast-feeding	Contraindicated	

06f	Itraconazole  Tab 100mg  Antifungal	S*	Indication	Penicilliosis, histoplasmosis, dermatophytis of the scalp (tinea capitis)			
			Dosage	Penicilliosis: treatment 200mg BID prevention 200mg OD Dermatophytis: 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	Contraindicated	Breast-feeding	Contraindicated	
06f	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 contra-indication	Breast-feeding	No contra-indication	
06p	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	<1yr, ocular cysticercosis			
			Side-Effects	Headache			
			Interactions				
			Remarks	Also used for cutaneous lava migrans Take between meals			
			Pregnancy	Avoid in 1st trimester	Breast-feeding	No contra-indication	
06p	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 in 1st trimester	Breast-feeding	No contra-indication	

06p	Artesunate  tab 50mg amp 60mg  Antiparasite/ antimalarial	E	Indication	Malaria – falciparum ( <i>refer to malaria guidelines</i> )			
			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			
			<u>Pregnancy</u>	Do NOT use in first trimester	<u>Breast-feeding</u>	No contra-indication	
06p +30	Chloroquine base  tab 150mg tab 250mg  Antiparasite/ antimalarial	E	Indication	Malaria - simple PV, PO, PM ( <i>refer to malaria guidelines</i> ) 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				
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06p	Dihydroartemisinin/ Piperaquine (DP)  Tab 20/160mg Tab 40/320mg  Antiparasite/ antimalarial	j	Indication	Malaria – uncomplicated falciparum ( <i>refer to malaria guidelines</i> )			
			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				
			<u>Pregnancy</u>	Contraindicated	<u>Breast-feeding</u>	No contra-indication	
06p	Mebendazole  tab 100mg tab 500mg  Anthelmintic	E	Indication	Worm: ascariasis, trichuriasis, hookworm, enterobiasis, trichinellosis			
			Dosage	Child >1yr/Adult: 100mg BID 3 days ; if >6m/<10kg: 50mg BID 3 days			
			Contraindication	Pregnancy first trimester, children <6m			
			Side-Effects	GI disturbance, headache dizziness			
			Interactions				
			Remarks	Take between meals			
			<u>Pregnancy</u>	Avoid 1 <sup>st</sup> trimester	<u>Breast-feeding</u>	No contraindication	

06p	Mefloquine  tab 250mg  <i>Antiparasite/ antimalarial</i>	E	Indication	Malaria – uncomplicated ( <i>refer to malaria guidelines</i> )			
			Dosage	PO: D1 – none ; D2 – 15mg/kg; D3 – 10mg/kg			
			Contraindication	Mefloquine given within last 2 mths, child <5kg, seizures, mental illness, deep jaundice, unconscious, allergy.			
			Side-Effects	GI disturbance, dizziness, headache, sleeping disorders			
			Interactions	Sodium valproate, carbamazepine, chloroquine, quinine, co-artemether			
			Remarks	Always use in combination			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	No contra-indication	
06p	Niclosamide  tab 500mg  <i>Anti-helminthic</i>	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			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06p	Praziquantel  tab 600mg  <i>Anti-helminthic</i>	E	Indication	Tapeworm, paragonimus (flake 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	Not active against liver flukes, patients with neurocysticercosis may develop seizures			
			<u>Pregnancy</u>	Do not use 1 <sup>st</sup> trimester	<u>Breast-feeding</u>	No contraindication	
06p	Primaquine  tab 15mg tab 5mg tab 7.5mg  <i>Antiparasite/ antimalarial</i>	E*	Indication	Malaria – to reduce transmission ( <i>refer to malaria guidelines</i> )			
			Dosage	PV, PM, PO: 0.5mg/kg OD for 14 days PV, PM, PO + G6PD deficiency: 0.5mg/kg once a week for 8 weeks PF: 0.25mg/kg STAT (no need for G6PD test)			
			Contraindication	Infant <6 mths, Hb <6g/dl, rheumatoid arthritis			
			Side-Effects	Vomiting, loss of appetite, abdominal pain			
			Interactions				
			Remarks	Be careful with G6PD			
			<u>Pregnancy</u>	Contraindication	<u>Breast-feeding</u>	Do not use if baby <6 mths	



06p	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	Breast-feeding	No contra-indication	
06p	Quinine  amp 600mg/2ml tab 300mg  Antiparasite/ antimalarial	E	Indication	Malaria – falciparum ( <i>refer to malaria guidelines</i> )			
			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-artemeter			
			Remarks	Monitor blood glucose closely IM injection should be deep into anterior thigh <b>Always use in combination</b>			
			Pregnancy	No contra-indication	Breast-feeding	No contra-indication	
06p b	Clindamycin  tab 150mg tab 300mg  Antibiotic/ Lincosamide/ antimalarial	E	Indication	Malaria ( <i>refer to malaria guidelines</i> ), osteomyelitis, 2nd line for pneumocystis carinii pneumonia			
			Dosage	5mg/kg TID			
			Contraindication	History of allergy			
			Side-Effects	Colitis (stop and give metronidazole), nausea, rash, jaundice, allergy			
			Interactions	Erythromycin			
			Remarks	<b>For malaria, always use in combination</b>			
			Pregnancy	No contra-indication	Breast-feeding	Avoid	
06p b	Doxycycline  tab 100mg tab 200mg  Antibiotic/ antimalarial Tetracycline	E	Indication	Malaria ( <i>refer to malaria guidelines</i> ), Leptospirosis, Scrub typhus, Chlamydia, Trachoma, Lymphatic filariasis			
			Dosage	Child >8yrs and Adult: 2mg/kg BID or 4mg/kg OD ; Take with meal			
			Contraindication	Child <8yrs			
			Side-Effects	Allergic reaction, headache, photosensitivity			
			Interactions	Phenytoin, phenobarbitone, carbamazepine, iron preparations, antacids			
			Remarks	<b>For malaria, always use in combination</b>			
			Pregnancy	Contraindication	Breast-feeding	Avoid	

06v	Abacavir (ABC)  <i>Antiretroviral/NRTI</i>	j	Indication	HIV– in combination with other antiretrovirals			
			Dosage	Child <25 kg: 8mg/kg BID ; Child ≥ 25 kg/ Adult: 300mg BID			
			Contraindication	Severe hepatic impairment, history of allergic reaction			
			Side-Effects	Skin rash, GI disturbance, cough, dyspnea, headache, tiredness, oedema, myalgia			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Refer to protocol	
06v +21	Acyclovir  oint 5mg tab 200mg tab 400mg  <i>Antiviral</i>	E	Indication	Genital herpes, herpes in immunocompromised patients, severe varicella zoster			
			Dosage	Child <2yrs: 200mg 5 x per day, Child > 2yrs/Adult: 200-400mg 5x per day for 7 days			
			Contraindication	Allergy			
			Side-Effects	Headache, skin rash, allergic reaction, GI disturbance			
			Interactions				
			Remarks	Start within 72 hours of lesions appearing. Drink plenty of fluid. Reduce dose if renal impairment			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06v	Efavirenz (EFV)  tab 600mg  <i>Antiretroviral/NNRTI</i>	E	Indication	HIV – in combination with other antiretrovirals			
			Dosage	10-14kg: 200mg OD ; 15-19kg: 250mg OD ; 20-24kg: 300mg OD ; 25-32kg: 350mg OD ; 33-39kg: 400mg OD ; >40kg: 600mg OD			
			Contraindication	Children <3yrs, severe hepatic impairment			
			Side-Effects	Neurological disorders, psychiatric disorders, raised liver enzymes, skin reactions			
			Interactions	Risk of thromboembolism with oral contraceptives			
			Remarks	Be careful if known psychiatric history or epilepsy			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Refer to protocol	
06v	Lamivudine-3 TC  tab 150mg  <i>Antiretroviral/NRTI</i>	S	Indication	HIV – in combination with other antiretrovirals			
			Dosage	Child <1 mth: 2mg/kg BID ; Child 1 mth - 12yrs: 4mg/kg BIDAdult: 300mg OD or 150mg BID			
			Contraindication				
			Side-Effects	GI disturbance, blood disorder, hepatic/pancreatic disorder			
			Interactions				
			Remarks	Reduce in renal impairment, be careful with hepatic impairment			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	Refer to protocol	



06v	Lopinavir 200mg + Ritonavir 50mg  Antiretroviral/ protease inhibitors  Tab	S	Indication	HIV – in combination with other antiretrovirals (2 <sup>nd</sup> line)			
			Dosage	Child 2wk-6m: 16/4mg/kg BID ; Child >6m: 7 to 15 kg: 12/3mg/kg BID ; 15 to 40 kg: 10/2.5mg/kg BID ; Adult: 400/100mg BID			
			Contraindication	Severe hepatic impairment			
			Side-Effects	GI disturbance, skin rash, hepatic and pancreatic disorders, diabetes			
			Interactions	Oral contraceptives			
			Remarks	Do not combine with rifampicin			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	Refer to protocol	
06v	Nevirapine (NVP) tab 200mg  Antiretroviral/NNRTI	S	Indication	HIV – in combination with other antiretrovirals			
			Dosage	Child 2m-8yrs: 4mg/kg OD for 14 days, then 7mg/kg BID Child >8yrs: 4mg/kg OD for 14 days, then 4mg/kg BID max 400mg/day Adult: 200mg OD for 14 days, then 200mg BID			
			Contraindication	Rifampicin			
			Side-Effects	Severe skin rash, hepatic disorder, GI disturbance, headache, myalgia			
			Interactions	Oral contraceptives			
			Remarks	Monitor liver enzymes, if ALT 5x normal stop NVP			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	Refer to protocol	
06v	Stavudine D4T tab 20mg tab 30mg  Antiretroviral/NRTI	S	Indication	HIV – in combination with other antiretrovirals			
			Dosage	Child >3mths and <25kg: 1mg/kg BID ; Child ≥ 25kg/ Adult: 60mg/day in 2 divided doses			
			Contraindication	Peripheral neuropathy or pancreatitis, Zidovudine			
			Side-Effects	Peripheral neuropathy, GI disturbance, lipodystrophy, hyperlipidaemia, severe hepatic/pancreatic disorder			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	Refer to protocol	
06v	Tenofovir tab 300mg  Antiretroviral/NRTI	S	Indication	HIV – in combination with other antiretrovirals			
			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				
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	Refer to protocol	

06v	Valacyclovir  <i>Antiviral</i>  tab	j	Indication	Herpes encephalitis			
			Dosage	1g TID			
			Contraindication				
			Side-Effects	GI disturbance, headache, rash, tiredness, photosensitivity			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
06v	Zidovudine (AZT)  tab 100mg syrup 10mg/ml  <i>Antiretroviral/NRTI</i>	S	Indication	HIV – in combination with other antiretrovirals			
			Dosage	Premature infant: 1.5mg/kg BID for 2 weeks then 4mg/kg BID Child <4wks: 4mg/kg BID ; Child >4wks to 13yrs: 180 to 240mg/meter2 BID Adult: 300mg BID			
			Contraindication	Severe haematological disorder, stavudine			
			Side-Effects	Haematological disorder, GI disturbance, headache, myopathy			
			Interactions				
			Remarks	Stop taking if severe anaemia or hepatic impairment			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	Refer to protocol	
<b>07    *Antimigraine medicine (for attack: AAS, ibu, para ; for prevention: propranolol)</b>							
<b>08    *Anticarcino and immunosuppressive</b>							
08 <sup>c</sup>	Cyclophosphamide  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, hematuria, hair lose, skin rash, infertility, leukemia			
			Interactions				
			Remarks	Check kidney function before start ; reduce dose if renal impairment			
			<u>Pregnancy</u>	Contra-indication	<u>Breast-feeding</u>	Contra-indication	
<b>09    *Antiparkinsonian</b>							
09	Levodopa Carbidopa Tab 250mg/25mg	I	Indication	Parkinson disease and extrapyramidal disorder (except induced by neuroleptics)			
			Dosage	Step by step to maintenance dose 750-1500mg/day, (divided in 3-4 doses), Take after meal			
			Contraindication	Psychosis, confusion, glaucoma, melanoma, myocardial infarction			
			Side-Effects	Anorexia, dizziness, arrhythmia, depression,			
			Interactions				
			Remarks	Excessive dosage (dyskinesia, tremor), fluctuation & reduction of the effects			
			<u>Pregnancy</u>	Contra-indication	<u>Breast-feeding</u>	Contra-indication	

09 <sup>c</sup>	Benzhexol (Artane) (Trihexyphenidyl) 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, diazepam			
			Remarks	Anticholinergic (e.g. biperiden)			
			<u>Pregnancy</u>	Contra-indication	<u>Breast-feeding</u>	Contra-indication	
10	<i>*Medicine affecting blood</i>						
10	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 neutrophil			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Avoid	
10	F.B.C. Tab	E*	Indication	Prevention and treatment of anemia			
			Dosage	1 tab BID or TID			
			Contraindication	Overload of ferrous, thalassemia, drug given with other vitamin, severe liver disease			
			Side-Effects	GI disturbance, change stool color			
			Interactions				
			Remarks	Fe 200mg, vit B1 2mg, B2 2mg, B12 5mg, C 20mg, B3 10mg, FA 100mcg, Ca 100mg			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
10	Ferrous Sulphate tab 200mg tab 50mg	E	Indication	Prevention (pregnancy, malnutrition) and treatment of anemia			
			Dosage	Child <5kg: 50mg ; Child >5kg: 100-200mg ; Adult: 200mg <b>Take with meal</b> <i>Prevention:</i> OD (Child: 1-2mg/kg/day) ; <i>Treatment:</i> BID/TID (Child: 3-6mg/kg/day)			
			Contraindication	Sickle cell anemia, thalassemia, severe liver disease			
			Side-Effects	GI disturbance, including constipation and change of stool color			
			Interactions	Ciprofloxacin, doxycycline, methotrexate, antacids (decrease effect if taken at the same time)			
			Remarks	200mg of ferrous sulfate contains 65mg of element iron			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication ; for child, give to mother	

10	Folic Acid = calcium folinate=vitamin B9 tab 5mg	E	Indication	Megaloblastic anemia: malnutrition, repeat attack of malaria, intestinal parasitosis Prophylaxis of neural tube defects (very early pregnancy)			
			Dosage	Child: 2.5mg ; Adult: 5mg ; Prevention dose: once per week ; Treatment dose: OD			
			Contraindication				
			Side-Effects				
			Interactions				
			Remarks	Be careful if suspect/confirmed malignancy			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication ; for child, give to mother	
10	Heparin  Anticoagulant  keep 8-15°c	I	Indication	Venous and arterial thrombosis, pulmonary embolism, myocardial infarction, phlebitis Prevention of venous and arterial thrombosis			
			Dosage	Treatment: 400-600IU/kg/day IV or 250IU/kg/day SC (every 12h) Prevention: 150 IU/kg/day			
			Contraindication	Hemorrhage (or risk of), thrombocytopenia, intramuscular injection (IM)			
			Side-Effects	Thrombocytopenia, allergy, hemorrhage if over dosage			
			Interactions	Aspirin, NSAID			
			Remarks	Adjust dosage according to coagulation tests			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
10	Vitamin B12 (=cobalamin)  tab 100mcg vial 1mg	E	Indication	Vitamin B12 deficiency such as megaloblastic anemia, 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, acne			
			Interactions				
			Remarks	Bettlenut and alcohol reduce absorption			
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	

10	Warfarin  <i>Anticoagulant</i>	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 <i>If bleeding and/or INR &gt; 5 : stop warfarin, and consider to restart once INR &lt;5</i> <i>If INR bleeding and/or INR &gt;8 : give Vitamin K 2.5-5mg (IV or PO)</i>			
			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			
			<u>Pregnancy</u>	<i>Do Not use in 1<sup>st</sup> trimester</i>	<u>Breast-feeding</u>	<i>No contraindication</i>	
11	<i>*Blood product (blood transfusion, Ig...)</i>						
11	Red blood cell (Unmixed)  Or  Mixed blood	E	Indication	Symptomatic anaemia, acute bleeding with shock and/or severe thrombopenia			
			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			
			<u>Pregnancy</u>	<i>No contraindication</i>	<u>Breast-feeding</u>	<i>No contraindication</i>	
12	<i>*Cardiovascular medicine</i>						
12 +02 +7	Aspirin =Acetylsalicylic acid  tab 300mg	E	Indication	Mild pain, Fever ,Rheumatic diseases, prevention of thrombosis/stroke/infarct			
			Dosage	Child >12yrs: 10-15mg/kg QID Max 100mg/kg/day Adult: 300-900mg QID Max 4g/day Prevention dose 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.			
			<u>Pregnancy</u>	<i>Contraindication</i>	<u>Breast-feeding</u>	<i>Avoid</i>	

12	Atenolol  tab 25mg tab 50mg  <i>Betablocker (cardioselective)</i>	E	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			
			<u>Pregnancy</u>	No contraindication, but monitor newborn glucose	<u>Breast-feeding</u>	Avoid	
12	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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
12	Enalapril  tab 20mg tab 5mg  <i>ACE inhibitor</i>	E	Indication	Hypertension, congestive heart failure			
			Dosage	Starting dose Adult: 5mg OD ; Old person: 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 for potassium if use with diuretic			
			<u>Pregnancy</u>	Contraindication	<u>Breast-feeding</u>	No contraindication	
12 +16	Furosemide  tab 40mg amp 20mg/2ml amp 40mg/2ml  <i>Diuretic</i>	E	Indication	Oedema caused by renal, hepatic or congestive heart failure ; hypertension, pulmonary oedema			
			Dosage	Child: 1-2mg/kg OD ; Adult: 20-40mg OD ; if persistent edema: 80-150mg			
			Contraindication	Other types of edema such as with kwashiorkor, hepatic encephalopathy			
			Side-Effects	Hypokalemia, 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)			
			<u>Pregnancy</u>	avoid	<u>Breast-feeding</u>	avoid	



12 +16	Hydrochlorothiazide tab 50mg  <i>Diuretic</i>	E	Indication	Hypertension			
			Dosage	12.5mg OD, maximum 50mg OD			
			Contraindication	Severe renal/liver failure, gout, pregnancy, kwashiorkor			
			Side-Effects	Low potassium, high glucose, dehydration,			
			Interactions				
			Remarks	Be careful when use for diabetes, Advise to eat a lot of fruit (fruit contains potassium)			
			<u>Pregnancy</u>	avoid	<u>Breast-feeding</u>	avoid	
12	Isosorbide dinitrate tab 10mg  <i>Antianginal</i>	E	Indication	Prophylaxis & treatment of acute angina and MI, congestive heart failure			
			Dosage	Adult: start 10mg BID, gradually increase, (max 30mg QID) <i>If for treatment of acute angina/MI: give sublingually 5-10mg</i>			
			Contraindication	Hypotension, heart valve problems, severe anemia ; be careful if hypothyroidism			
			Side-Effects	Headache, flushing, hypotension, tachycardia, hemolysis (G6PD deficiency)			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	avoid	<u>Breast-feeding</u>	Not recommended	
12	Methyldopa tab 250mg  <i>Antihypertensive (centrally acting)</i>	E	Indication	Hypertension especially during pregnancy			
			Dosage	Starting dose 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				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
12 +22	Nifedipine tab 10mg  <i>Calcium blocker</i>	E	Indication	Hypertension especially during pregnancy, Threatened premature labour (tocolytic)			
			Dosage	HTN: 10-50mg BID ; Premature labor: 20mg TID			
			Contraindication	Severe cardiac disease, systolic <90mmHg, magnesium or salbutamol			
			Side-Effects	Headache, flushing, peripheral edema, hypotension, tachycardia,			
			Interactions	Cimetidine, phenytoin, rifampicin, betablockers, grapefruit			
			Remarks	Be Careful BP drop abruptly, do not give as long term treatment			
			<u>Pregnancy</u>	Contraindicated during 1 <sup>st</sup> trimester	<u>Breast-feeding</u>	avoid	

12 +7	Propranolol  tab 10mg tab 40mg  <i>Beta blocker</i>	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				
			<u>Pregnancy</u>	No contraindication; monitor newborn glucose		<u>Breast-feeding</u>	avoid	
12	Simvastatin	I	Indication	High level of LDL cholesterol, for patient with high risk of cardiovascular disease				
			Dosage	Adult: start 5-10mg OD, max 40mg OD				
			Contraindication	Liver disease, transaminase elevated, myopathy, kidney failure				
			Side-Effects	GI disturbance, muscle pain, headache, neuropathy, tendinitis, high transaminases				
			Interactions	Grapefruit				
			Remarks					
			<u>Pregnancy</u>	contraindication		<u>Breast-feeding</u>	contraindication	
12	Spironolactone  tab 25mg  <i>Potassium sparing diuretic</i>	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				
			<u>Pregnancy</u>	Do Not Use		<u>Breast-feeding</u>	Do Not Use	



12	Hydralazine  vial 20mg	S	Indication	Severe hypertension in pregnancy, if systolic BP $\geq$ 160mmHg and diastolic BP $\geq$ 110			
			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, FHS			
			<u>Pregnancy</u>	Avoid during 1 <sup>st</sup> trimester	<u>Breast-feeding</u>	No contraindication	
12	Labetalol  tab 40mg  <i>Betablocker</i>	I*	Indication	Hypertension			
			Dosage	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			
			<u>Pregnancy</u>	No contraindication - monitor newborn glucose	<u>Breast-feeding</u>	Avoid	
13	<i>*Dermatological medicine (topical)</i>						
13	Benzoic acid + salicylic acid Whitefield ointment ointment 15% ointment 500mg	E	Indication	1st line treatment for dermatophyte infection of the scalp and of the skin			
			Dosage	2 applications per day, sparingly on clean and dry skin, during 3-6 weeks			
			Contraindication	Do not apply on superinfected or exudative lesions, mucous membrane or eyes			
			Side-Effects	Skin irritation, local benign inflammation			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
13	Benzyl Benzoate BBE 25% 450ml	E	Indication	Scabies and pediculosis			
			Dosage	Apply to the whole body (avoid mucous membranes and eyes), do not wash for 12 hours			
			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.			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

13	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.			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
13	Clotrimazole (clotri-derm) Cream 5-10-20mg cream 450mg vag-tab  <i>Antifungal</i>	E	Indication	2 <sup>nd</sup> line treatment for fungal skin infection including ringworm 1 <sup>st</sup> line treatment for vaginal candidiasis			
			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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
13	Gentamicin  cream 1mg cream 500g  <i>Antibiotics/ aminoglycoside</i>	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			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	No contraindication	
13	Hydrocortisone Cream  <i>Steroid</i>	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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

13	Miconazole Cream  Antifungal	I	Indication	Cutaneous candidiasis, candida balanitis, mild dermatophyte infection			
			Dosage	Apply BID, sparingly, on clean and dry skin, during 1-4 weeks			
			Contraindication				
			Side-Effects	Local irritation			
			Interactions	Can damage the latex in condoms (protection no longer guaranteed)			
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
13	Podophylline 15-25% liq 100ml	I	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			
			<u>Pregnancy</u>	Do not use	<u>Breast-feeding</u>	Do not use	
13	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			
			Side-Effects	Skin reaction ; if applied to large burn - systemic absorption			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	Avoid during last month	<u>Breast-feeding</u>	No contraindication	
13	White paraffin Vaseline Ointment cream 500g	E	Indication	Dry skin, protective barrier, lubrication			
			Dosage	Apply topically PRN			
			Contraindication				
			Side-Effects				
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
14	*Diagnosis agent						

15	*Disinfectants and antiseptics						
15	Alcohol spirit (ethanol solution 70%)	E	Indication	Cord care Antisepsis of intact skin prior to injections and venopunctures Disinfection of latex stoppers of drugs vials and infusion bottles Disinfection of non-critical medical items (contact with intact skin only) that are not soiled by blood or other body fluid			
			Dosage	Use 70% (more effective than higher concentration)			
			Contraindication	Do not apply to mucous membranes, wounds or burns: it's painful, irritating and slows the healing process; Do not use to sterilize before BCG			
			Side-Effects				
			Interactions				
			Remarks	For cord care, alternative is to use sterile water/NSS)			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
15	Chlorhexidine + cetrimide (=Savlon)	E*	Indication	Antisepsis of minor and superficial wounds, cleaning skin/mucous before invasive procedure			
			Dosage	Diluted in water before using use 1% (1ml in 100ml water)			
			Contraindication	No contact with body cavities, eyes (risk of corneal damage), brain and meninges, middle ear			
			Side-Effects	Skin irritation			
			Interactions				
			Remarks	Do not use with soap or other antiseptics (incompatibility); After dilution use only for one day			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
15	Chlorine powder	E	Indication	Disinfection of medical devices, instruments, linen, floors and surfaces			
			Dosage	0.5% chlorine solution , prepare solution with cold water, in a non-metallic container ; Use, then wait 10-15min and rinse with water			
			Contraindication	Do not swallow			
			Side-Effects				
			Interactions	Do not mix with acid solutions such as urine			
			Remarks	3 tea-spoons to mix with 2 litres of water			
			Pregnancy	NA	Breast-feeding	NA	
15	Gentian Violet 450ml	E	Indication	Fungal skin infection, wet skin lesions including impetigo, oral candidiasis			
			Dosage	Apply to affected area BID			
			Contraindication	Previous allergy			
			Side-Effects	Staining of skin			
			Interactions				
			Remarks	Avoid contact with clothes			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	

15	Hydrogen Peroxide 450ml	E	Indication	Mild disinfectant for minor cuts, wounds and skin ulcers			
			Dosage				
			Contraindication				
			Side-Effects	Irritating burns on the skin and mucous membranes with a white eschar			
			Interactions				
			Remarks	If other disinfectant available, use other			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
15	Povidone iodine	E	Indication	Cleaning skin before invasive procedure, cleaning wounds, cleaning multi dose drug vials (not vaccine)			
			Dosage	Apply to area required to be sterile			
			Contraindication	Do not use with other antiseptic solutions. Do not use in preterm neonates <1.5kg			
			Side-Effects				
			Interactions				
			Remarks	For procedures allow solution to dry before proceeding Do not use large volumes repeatedly due to risk of transcutaneous transfer of iodine			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
16 *Diuretics (furosemide, spironolactone, hydrochlorothiazide)							
17 *Gastrointestinal medicine							
17	Aluminum Hydroxide tab 250mg  Antiacid	E	Indication	1 <sup>st</sup> line for stomach pain associated with 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, diarrhea			
			Interactions	Reduce absorption of many drug ; take 2hours from any other medication			
			Remarks	Chew tablet			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
17	Bisacodyl tab 5mg  Stimulant laxative	E	Indication	Constipation			
			Dosage	Child >3yrs: 5-10mg OD ; Adult: 10-15mg OD			
			Contraindication	Intestinal obstruction, inflammatory bowel disease			
			Side-Effects	Diarrhea, cramps, low potassium			
			Interactions				
			Remarks				
			Pregnancy	Avoid	Breast-feeding	Avoid	

17	Cimetidine  tab 200mg tab 400mg  <i>Antiulcer</i>	E	Indication	2 <sup>nd</sup> line for gastro-oesophageal reflux or peptic ulcer, 2nd line for complicated peptic ulcer			
			Dosage	Adult: 400mg BID for 4 weeks			
			Contraindication	Phenytoin and aminophylline ; be careful if liver and kidney disease, 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			
			<u>Pregnancy</u>	Do not use	<u>Breast-feeding</u>	Contraindication	
17	Domperidone  tab 10mg	E	Indication	To increase breast milk supply, neonatal gastro-oesophageal reflux, nausea and vomiting			
			Dosage	Adult: 10-20mg TID or QID ; Neonate: 250 mcg/kg TID (max dose 400 mcg/kg QID)			
			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			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	No contraindication	
17	Enema Sodium chloride 15%	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)			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	



17	Lactulose 15ml / dose-sachet	E	Indication	Constipation (2nd line) especially for child and pregnant woman; hepatic encephalopathy (reduce hyperammonemia)			
			Dosage	Constipation: (15-45ml/day) Child 6-14ysr: 15mL ; 1-6ysr: 5-10mL ; Infant <1yr: 5mL Encephalopathy: 30-45ml TID according to response			
			Contraindication	Bowel obstruction, inflammatory bowel disease			
			Side-Effects	Diarrhea			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
17	Loperamide tab 2mg	S	Indication	Chronic diarrhea with HIV			
			Dosage	Child 4-8ysr: 1mg QID max 3 days ; Child 8-12ysr: 2mg QID max 5 days Adult: 4mg STAT then 2mg after each loose stool. Max 16mg per day for 5 days			
			Contraindication	Child under 2yrs, bloody or Infective diarrhea, abdominal distension			
			Side-Effects	Abdominal cramps, dizziness, rash, constipation			
			Interactions				
			Remarks	Use very cautiously			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
17	Magnesium Tab	S*	Indication	For supplementation feeding, for malnourished child, hypomagnesium			
			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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
17	Metoclopramide amp 10mg tab 10mg	E	Indication	Nausea and vomiting			
			Dosage	PO/IV Child: 0.12mg/kg TID ; Adult: 10-15mg TID or QID ; max 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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	



17 <sup>s</sup>	MOM (Milk of Magnesium) syrup 240ml	S	Indication	Gastritis, constipation			
			Dosage	For constipation: Adult: 30-60ml at night ; Child: 5-15ml at night For gastritis: Adult; 5-15ml QID (400mg/5ml)			
			Contraindication	Renal failure, peritonitis, intestinal obstruction, severe heart disease			
			Side-Effects	Abdominal cramps, diarrhea, hypotension, muscle weakness			
			Interactions				
			Remarks				
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
17 <sup>s</sup>	Omeprazole tab 20mg	E	Indication	1 <sup>st</sup> line of complicated peptic ulcer (perforation, hemorrhage), for healing and preventing recurrence 2 <sup>nd</sup> 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 antibiotic): 20mg BID			
			Contraindication				
			Side-Effects	Headache, diarrhea, skin rash, dizziness, abdominal pain			
			Interactions	Warfarin, digoxin, phenytoin, itraconazole			
			Remarks	Omeprazole may be introduced in IPD			
			Pregnancy	Avoid 1 <sup>st</sup> trimester	Breast-feeding	Not recommended	
18	*Hormone, other endocrine drug, Contraceptives						
18	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	Breast-feeding	Do Not Use		

18	COC (Combine Oral Contraceptive ) Estrogen+ progestogen  <div>Tab 21 tab effective 7 tab placebo</div>	E	Indication	Contraception For family planning			
			Dosage	1 tab OD (start the 1st -5th day of menstruation, or immediately after abortion, or at the 21st day after childbirth if the woman does not breastfeed )			
			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			
			Side-Effects	Oligoamenorrhoea, vaginal candidiasis, nausea, weight gain, breast tenderness, mood change, acne, headache			
			Interactions	Rifampicin, phenytoin, carbamazepine, griseofulvin, phenobarbital, ARV			
			Remarks	Low risk of contraceptive failure with oral antibiotic			
			<u>Pregnancy</u>	<u>Contraindication</u>	<u>Breast-feeding</u>	<u>Contraindication</u>	
18	Depo-Progesterone Vial  Medroxyprogesterone acetate  <i>Long acting progesterone</i>	E	Indication	Contraception for family planning			
			Dosage	150mg IM injection every 3mths, (1st injection given during first 5 days menstruation or after abortion or child birth)			
			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			
			<u>Pregnancy</u>	<u>Contraindication</u>	<u>Breast-feeding</u>	<u>No contraindication</u>	
18	Glibenclamide  tab 5mg	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 15mg/day)			
			Contraindication	Insulin dependent diabetes, juvenile diabetes, renal, hepatic or thyroid problem			
			Side-Effects	Hypoglycemia due to excessive dose, allergic reaction			
			Interactions	Alcohol			
			Remarks	Need blood glucose monitoring regularly			
			<u>Pregnancy</u>	<u>No contraindication</u>	<u>Breast-feeding</u>	<u>No contraindication</u>	
18	Glicazide	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			
			<u>Pregnancy</u>	<u>Contraindication</u>	<u>Breast-feeding</u>	<u>Contraindication</u>	

18	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 (3-6 weeks after), 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 anesthesia, scalpel and forceps			
			<u>Pregnancy</u>	Contra-indicated	<u>Breast-feeding</u>	No contraindication	
18	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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
18	Intermediate / Long acting insulin  Keep 2-8°c (fridge)	I	Indication	Insulin dependent diabetes			
			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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
18	Intermediate / Long acting insulin  Keep 2-8°c (fridge)	I	Indication	Insulin dependent diabetes			
			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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

18	IUD copper	E	Indication	Contraception (long term reversible) ; emergency contraception (EC)			
			Dosage	1 device inserted into uterine cavity, for 5yrs For EC, insert within 5 days of intercourse			
			Contraindication	Recent STI, severe anemia, PID, unexplained PV bleeding			
			Side-Effects	Painful heavy or irregular menstruation			
			Interactions				
			Remarks	Insert after menstruation finished. If possible screen for STI before insertion.			
			<u>Pregnancy</u>	Do Not Use	<u>Breast-feeding</u>	No contraindication	
18	Metformin tab 250mg	E	Indication	Diabetes non-insulin dependent or not controlled by well followed diet or In addition to insulin			
			Dosage	Start 500mg TID (maximum dose 1g TID)			
			Contraindication	Abnormal kidney functions, heart failure, alcoholism, radioactive contrast			
			Side-Effects	GI disturbance especially diarrhea, lactic acidosis, vit B12 malabsorption			
			Interactions	Alcohol, cimetidine, propranolol, steroids, hydrochlorothiazide, furosemide, contraceptive pill.			
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
18	PTU (propylthiouracil) tab 50mg	E	Indication	Hyperthyroidism			
			Dosage	Adult: 200-400mg OD (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 <i>If taken during pregnancy, risk of neonatal goiter and hypothyroidism: check TFTs</i>			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
18	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 after 4-6 weeks / reduce dose if >65yrs			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

19	<b>*Immunological, including vaccines</b>						
19	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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
19	BCG vaccine 1ml  <b>Cold Chain</b> Storage 2-8c Once 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				
			<u>Pregnancy</u>	Do Not Use	<u>Breast-feeding</u>	No contraindication	
19	DTP 5ml (DT whole cell P)  <b>Cold Chain</b> Storage 2-8c	E	Indication	Prevention of diphtheria, pertussis and tetanus			
			Dosage	0.5ml IM given at 6, 12, 18 weeks, 18 mths and 5yrs 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			
			<u>Pregnancy</u>	Use dT during pregnancy	<u>Breast-feeding</u>	Use dT in adult – no contraindication	
19	Hepatitis B  <b>0.5ml 1ml</b>  <b>Cold Chain</b> Storage 2-8c	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			
			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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

19	Influenza vaccine  <i>Cold Chain</i> <i>Storage 2-8c</i>	I	Indication	Prevention of seasonal flu			
			Dosage	Follow guidelines from vaccine provider ; every year			
			Contraindication	Previous severe reaction, postpone if fever >38°C			
			Side-Effects	Local skin reaction, fever, rarely anaphylaxis			
			Interactions				
			Remarks	From donation opportunity for staff or special patient (chronic)			
			<u>Pregnancy</u>	No contraindication		<u>Breast-feeding</u>	No contraindication
19	Japanese encephalitis vaccine JE 0.5ml  <i>Cold Chain</i> <i>Storage 2-8c</i>	E	Indication	Prevention of Japanese encephalitis			
			Dosage	0.5ml IM at 18 mths, 19 mths, 2yr 7 mths			
			Contraindication	Previous severe reaction, postpone if fever >38°C			
			Side-Effects	Local skin reaction, fever, rarely anaphylaxis			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	Avoid		<u>Breast-feeding</u>	
19	Measle/Mumps/Rubella vaccine (MMR) 5ml  <i>Cold Chain</i> <i>Storage 2-8c</i>	E	Indication	Prevention of measles, mumps and rubella			
			Dosage	0.5ml IM 9 mths and 2 ½ yrs			
			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			
			<u>Pregnancy</u>	Avoid		<u>Breast-feeding</u>	No contraindication
19	Oral polio vaccine (OPV) 2ml  <i>Cold Chain</i> <i>Storage 2-8c</i>	E	Indication	Prevention of poliomyelitis			
			Dosage	2-3 drops PO at 6 weeks, 12 weeks, 18 weeks, 18 mths, 5yrs			
			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			
			<u>Pregnancy</u>	NA		<u>Breast-feeding</u>	NA
19	Rabies immunoglobulin  <i>Cold Chain</i> <i>Storage 2-8c</i>	I	Indication	Post exposure prophylaxis against rabies infection (available at MSH – 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			
			<u>Pregnancy</u>	No contraindication		<u>Breast-feeding</u>	No contraindication



19	Rabies vaccine  <i>Cold Chain</i> <i>Storage 2-8c</i>	I	Indication	Prevention of rabies (available at MSH – self referral)			
			Dosage	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				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
19	Tetanus immunoglobulin  <i>Cold Chain</i> <i>Storage 2-8c</i>	I	Indication	Post exposure prophylaxis against tetanus infection, treatment of tetanus			
			Dosage	PEP: 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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
19	Tuberculin  <i>Cold Chain</i> <i>Storage 2-8c</i>	I	Indication	Testing for TB: result should be read after 48-72 hours: positive if > 10mm induration			
			Dosage	0.1ml Intradermal mid forearm			
			Contraindication	Live vaccine given <4 weeks before			
			Side-Effects	Itching, erythema, ulceration			
			Interactions	Recent live vaccine, malnutrition, viral infection, immunosuppression			
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
20 <i>*Muscle relaxant</i>							
21 <i>*Ophtalmological agents</i>							
21	Acetazolamide (Diamox) tab 250mg	S*	Indication	Glaucoma			
			Dosage	0.25-1g per day in divided doses <i>Angle closure glaucoma:</i> 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				
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Can use	



21	Chloramphenicol eye drop	E	Indication	2 <sup>nd</sup> 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			
			<u>Pregnancy</u>		<u>Breast-feeding</u>		
21	Ciprofloxacin eye drop	E*	Indication	Eye infection with corneal ulcer			
			Dosage	Apply frequently – up to every 15 mins on day 1			
			Contraindication				
			Side-Effects	Burning/itching sensation			
			Interactions				
			Remarks	Only use for corneal ulcers			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
21	Dexoph eyee (=Decordex-N) neomycin + dexamethasone eye drop	E	Indication	After eye surgery			
			Dosage	1 or 2 drops 4-6 hrly, 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			
			<u>Pregnancy</u>	Contra-indication	<u>Breast-feeding</u>	Contra-indication	
21	Econazole eye drop	I	Indication	Fungal corneal ulcers			
			Dosage	1 drop 6-8 times per day			
			Contraindication				
			Side-Effects				
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contra-indication	<u>Breast-feeding</u>	No contra-indication	
21	Gentamicin Antibiotic eye drop	E*	Indication	Conjunctivitis 2 <sup>nd</sup> 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				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

21	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 acetazolamide in angle closure glaucoma			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
21	Tetracaine 0.5%  eye drop	E	Indication	Local anesthesia for eye surgery			
			Dosage				
			Contraindication	Allergy to tetracaine			
			Side-Effects	Allergy, corneal lesion if repeated /prolonged use			
			Interactions				
			Remarks	Onset 25sec ; duration 15min			
			<u>Pregnancy</u>	If possible, do not use	<u>Breast-feeding</u>	If possible, do not use	
21	Tetracycline TEO  Eye oint	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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
22	<i>*Oxytocics and antioxytocics</i>						
22	Ergometrine  vial 1ml  Storage 2-8C	E	Indication	2 <sup>nd</sup> line post-partum hemorrhage (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			
			<u>Pregnancy</u>	NA	<u>Breast-feeding</u>	NA	

22	Misoprostol  200mcg tab	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)			
			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	Breast-feeding	No contraindication	
22	Oxytocin  vial 10IU/ml  Storage 2-8C	E	Indication	Incomplete abortion, prevention and treatment of post-partum haemorrhage (PPH), induction of labour			
			Dosage	(refer to MTC protocol/obstetric guidelines)			
			Contraindication	Do not use for induction if previous c/s, fetal 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 fetal distress (contraction and FHS)			
			Pregnancy	Can use during delivery	Breast-feeding	No contraindication	
23	*Peritoneal dialysis						
24	*Medicine for mental and behavior disorder						
24	Chlorpromazine HCL  tab 100mg tab 25mg tab 50mg  Neuroleptic	C	Indication	Acute or chronic psychosis, severe anxiety not controlled by benzodiazepines			
			Dosage	Psychosis: 25mg TID increased up to maintenance dose (max 600mg) given OD at night Anxiety: 25-50mg TID (refer to supervisor)			
			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	Breast-feeding	Avoid	
24 +2	Fluoxetine  tab 20mg  Selective Serotonin Reuptake Inhibitor (SSRI)	C	Indication	Major depression			
			Dosage	20mg OD in the morning, for 6 mths minimum (refer to supervisor)			
			Contraindication	Aspirin, NSAID, alcohol ; Be careful if epilepsy, diabetes, GI bleeding, bipolar disorders			
			Side-Effects	Allergy, insomnia, GI disturbance, headache, psychic disorder, withdrawal syndrome			
			Interactions	Carbamazepine, phenytoin, lithium			
			Remarks	Wait 3 weeks before assessing therapeutic efficacy, if needed, increase to 40mg OD			
			Pregnancy	Is possible stop ; if not observe newborn	Breast-feeding	Avoid	

24	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			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Avoid	
24 +2	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			
			<u>Pregnancy</u>	Avoid	<u>Breast-feeding</u>	Avoid	
25	*Medicine acting on the respiratory tract						
25	Beclometasone 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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
25	Bromexine tab 8mg syrup	E*	Indication	Respiratory disorder with 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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

25	Salbutamol = albuterol Inhaler tab 2mg Syrup	E	Indication	Symptomatic treatment of asthma attack (nebulization and inhaler) Treatment of persistent asthma not controlled by inhaled steroid (tablet)			
			Dosage	<i>Dose and presentation depends on the severity</i> <i>Inhaler:</i> 2-4 puffs (up to 10 puffs) every 10-30 minutes if needed <i>Nebulisation:</i> 2.5mg-5mg (with NSS up to 4ml) during 10-15min, every 20-30 minutes if necessary <i>Tablet:</i> 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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
26	<b>*Solutions correcting water and electrolyte</b>						
26	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 hyper tonic solution IM/SC			
			Side-Effects	Local inflammation – irritant to veins			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
26 +17	ORS  Oral	E	Indication	Prevention and treatment of dehydration to replace fluid and electrolyte loss from acute diarrhoea, cholera			
			Dosage	<i>Prevention of dehydration:</i> WHO plan A <i>Treatment of moderate dehydration:</i> WHO plan B <i>Treatment of severe dehydration:</i> 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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	

26	Potassium chloride tab 500mg	E	Indication	Low potassium, maybe secondary to diuretics ; to make ORS			
			Dosage	Adult: 500mg TID			
			Contraindication	Do not combine with spironolactone			
			Side-Effects	GI disturbance, ulceration (to avoid take at the end of the meal)			
			Interactions				
			Remarks	Advise patient to alternatively eat plenty of fruit			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
27	*Vitamins and mineral						
27	Ascorbic acid = vitamin C tab 500mg tab 50mg	E	Indication	Indication and prevention of scurvy (vitamin C deficiency) Anemia 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 the situation requires			
			Contraindication	Iron overload			
			Side-Effects	GI disturbance, nephrolithiasis if dose >1g/day			
			Interactions				
			Remarks	Can be given also to help iron (ferrous sulfate) absorption			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
27	Calcium (Lactate) tab 300mg (Levulinate ) tab 500mg	S	Indication	Hypocalcaemia (prevention and treatment)			
			Dosage	Adults: 1 tab BID or TID			
			Contraindication				
			Side-Effects	Tingling, warm flushes, dizziness			
			Interactions				
			Remarks				
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
27	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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	



27	Pyridoxine vit B6 tab 10mg	E	Indication	Prevention and treatment of peripheral neuropathy (especially 2nd to isoniazid)			
			Dosage	Prevention: Child <5kg: 5mg OD ; Child >5 kg: 10mg OD Treatment: Child: 50mg OD ; Adult: 50mg TID			
			Contraindication				
			Side-Effects	GI disturbance, dizziness			
			Interactions				
			Remarks	Always give if INH treatment			
			Pregnancy	No contraindication	Breast-feeding	No contraindication	
27	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 <6m: 50000IU ; 6-12m: 100000IU ; Child >1yr: 200000IU Treatment OD on D1-2-8: Child <6m: 50000IU ; 6-12m: 100000IU ; Child >1yr: 200000IU			
			Contraindication				
			Side-Effects	Overdosage: GI disturbance, headache, raised intracranial pressure			
			Interactions				
			Remarks	Administer routinely 2 doses to children suffering from measles and other (pneumonia, diarrhea, malaria)			
			Pregnancy	Adapt dose	Breast-feeding	No contraindication	
27	Vitamin B Complex Tab	E*	Indication	Alcohol withdrawal, vitamin B deficiency			
			Dosage	Child <5yr: 1 tab/day ; Child >5yr: 2tab/day ; Adult: 3tab/day			
			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	Breast-feeding	No contraindication	
27	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 Prevention during pregnancy			
			Dosage	Severe deficiency: 100mg IM TID 1 day, then 100mg 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	Breast-feeding	No contraindication	



27	Vitamin K1  vial 1mg/1ml vial 10mg	E	Indication	Prevention of hemorrhagic disease of newborn			
			Dosage	Neonate: <1.5kg: 0.5mg IM ; >1.5kg: 1mg IM (soon after birth) Neonate treatment: 1mg TID IM Anticoag overdose: 2.5-5mg (IV or PO)			
			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			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
27	Zinc  tab 20mg	E	Indication	Acute or persistent diarrhea in child<5yrs (in combination with ORS therapy)			
			Dosage	Child <6m: 10mg OD ; Child 6m-5y: 20mg OD for 10 days (can be mixed in ORS)			
			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			
			<u>Pregnancy</u>	NR	<u>Breast-feeding</u>	NR	
28	*ENT						
29	*Specific medicine for neonatal care						
29 +25	Aminophylline  amp 10ml tab 100mg	E*	Indication	Prevention of apnea of prematurity 2 <sup>nd</sup> line treatment to consider in very severe asthma if salbutamol not effective			
			Dosage	Neonate <1.6kg or <34 weeks gest: Loading dose 8mg/kg PO, maintenance dose 2mg/kg BID			
			Contraindication	Cardiac disease, hypertension, hypothyroidism, epilepsy			
			Side-Effects	GI disturbance, palpitation, tachycardia, dizziness, neonatal irritability			
			Interactions				
			Remarks	2 <sup>nd</sup> line if theophylline not available			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	Avoid	

29	Theophylline  Tab syrup 60ml	I	Indication	Prevention of apnea of prematurity 2 <sup>nd</sup> 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	1 <sup>st</sup> line if possible (golden standard: caffeine)			
			<u>Pregnancy</u>	No contraindication	<u>Breast-feeding</u>	No contraindication	
30	*Medicine for disease of joint						
30	Allopurinol  tab	S	Indication	Treatment of gout, with hyperuricemia, in combination with diet			
			Dosage	100-300mg per day, take during meal			
			Contraindication	Child <6yrs			
			Side-Effects	GI disturbance, headache			
			Interactions	Aminopenicilline, glibenclamide			
			Remarks	Monitor uric acid			
			<u>Pregnancy</u>	Contraindicated	<u>Breast-feeding</u>	Contraindicated	
99	*Other						
99	Doxazosin  tab 2mg  <i>Alpha 1 blocker</i>	I*	Indication	Benign prostate hypertrophy (BPH)			
			Dosage	4mg per day, evening meal ; can increase to 8mg per day			
			Contraindication	Woman, child, liver impairment			
			Side-Effects	Sexual disturbance, hypotension, dizziness, headache, tiredness or weakness			
			Interactions				
			Remarks	Check PSA before to rule out carcinoma			
			<u>Pregnancy</u>	NR	<u>Breast-feeding</u>	NR	
99	Finasteride  tab 5mg	I*	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			
			<u>Pregnancy</u>	NR	<u>Breast-feeding</u>	NR	

**WHO 2013 Categories**

1. Anaesthetic and oxygen	16. Diuretics
2. Medicine for pain	17. Gastrointestinal medicine
3. Anti-Allergic medicine	18. Hormone, other endocrine drug, Contraceptives
4. Antidote	19. Immunological, including vaccines
5. Anticonvulsant and antiepileptic	20. Muscle relaxant
6. Anti-infective medicine	21. Ophthalmological agents
7. Antimigraine medicine	22. Oxytocics and antioxytocics
8. Anticarcino and immunosuppressive	23. Peritoneal dialysis
9. Antiparkinsonien	24. Medicine for mental and behavior disorder
10. Medicine affecting blood	25. Medicine acting on the respiratory tract
11. Blood product	26. Solutions correcting water and electrolyte
12. Cardiovascular medicine	27. Vitamins and mineral
13. Dermatological medicine (topical)	28. ENT
14. Diagnosis agent	29. Specific medicine for neonatal care
15. Disinfectants and antiseptics	30. Medicine for disease of joint

**Alphabetical Index of medication in the handbook**

Name of drug	WHO cat	MTC cat	Name of drug	WHO cat	MTC cat
Abacavir (ABC)	6v	S	Bromexine	25	E*
Acetazolamide (Diamox)	21	S*	Bromocriptine	18	E*
Acyclovir	6v	E	Buthylscopolamine (Buscopan)	2	E
Adrenaline	3	S	Calamine lotion	13	E
Albendazole	6p	E	Calcium	27	S
Alcohol spirit (ethanol solution 70%)	15	E	Calcium gluconate (or levulinate)	4	E
Allopurinol	30	S	Carbamazepine	5	C
Aluminum Hydroxide	17	E	Cefotaxime	6b	E
Aminophylline	29	E*	Ceftriaxone	6b	E
Amitriptyline	2	S	Cephalexin	6b	E
Amoxicillin	6b	E	Chloramphenicol	21	E
Amoxicillin/ Clav	6b	S	Chlorhexidine + cetrimide (savlon)	15	E*
Amphotericin B	6f	i	Chlorine powder	15	E
Ampicillin	6b	E	Chloroquine base	6p	E
Anti-D immunoglobulin	19	i	Chlorpheniramine	3	E
Artemether + lumefantrine (Coartem)	6p	i	Chlorpromazine HCL	24	C
Artesunate	6p	E	Cimetidine	17	E
Ascorbic acid = vitamin C	27	E	Ciprofloxacin	6b	E
Aspirin	12	E	Ciprofloxacin eye	21	E*
Atenolol	12	S	Clindamycin	6pb	E
Atropine Sulfate	1	S	Clotrimazole (clotriderm)	13	E
Azithromycin	6b	S	Cloxacillin	6b	E
BCG vaccine	19	E	COC (Combine Oral Contraceptive )	18	E
Beclometasone aerosol	25	i	Codeine	2	i
Benzathine benzylpenicillin	6b	S	Cotrimoxazole	6b	E
Benzoic acid + salicylic acid (Whitefield)	13	E	Cyclophosphamide	8	S
Benzyl Benzoate BBE	13	E	Deferiprone	10	i
Benzylpenicillin	6b	S	Depo-Progesterone	18	E
Bisacodyl	17	E			

Name of drug	WHO cat	MTC cat	Name of drug	WHO cat	MTC cat
Dexamethasone	3	E	Insulin	18	i
Diazepam	5	C	Intermediate acting insulin	18	i
Diclofenac	2	E	Isoniazid (H)	6b	i
Diethyl-carbamazine (D E C)	6b	S	Isopto Carpine/Pilocarpine 2%	21	E
Digoxin	12	E	Isosorbide dinitrate	12	E
Dihydroartemisinin/piperaquine (DP)	6p	E	Itraconazole	6f	S*
Domperidone	17	E	IUD copper	18	E
Doxazosin	99	i*	Japanese encephalitis vaccine JE	19	E
Doxycycline	6pb	E	Ketamine	1	i
DTP	19	E	Labetalol	12	i*
Econazole	21	i	Lactulose	17	E
Efavirenz (EFV)	6v	S	Lamivudine-3 TC	6v	S
Enalapril	12	E	Levodopa Carbidopa	9	i
Enema	17	i	Lidocaine (xylocaine)	1	S
Ergometrine	22	E	Lidocaine with Adrenaline	1	S
Erythromycin	6b	E	Loperamide	17	S
Ethambutol (E)	6b	i	Lopinavir 200mg + Ritonavir 50mg	6v	S
F.B.C.	10	E*	Loratadine or Cetirizine	3	i
Ferrous Sulphate	10	E	Magnesium	17	S*
Finasteride	99	i*	Magnesium sulphate	5	S
Fluconazole	6f	E	Marcaine Spina	1	S*
Fluoxetine	24	C	Measles/Mumps/Rubella vaccine (MMR)	19	E
Fluphenazine	24	C	Mebendazole	6b	E
Folic Acid	10	E	Mefenamic Acid	2	E
Furosemide	12	E	Mefloquine	6p	E
Gentamicin	6b	E	Meropenem	6b	i
Gentamicin cream	13	E*	Metformin	18	E
Gentamicin eye drop	21	E*	Methyldopa	12	E
Gentian Violet	15	E	Metoclopramide	17	E
Glibenclamide	18	E	Metronidazole	6b	E
Glicazide	18	i*	Miconazole	13	i
Glucose hyper 50%	26	E	Misoprostol	22	C
Griseofulvin	6f	E	MOM (Milk of Magnesium)	17	S
Haloperidol	24	C	Morphine	2	i
Heparin	10	i	Multivitamin	27	E*
Hepatitis B	19	E	Neomycin + dexamethasone	21	E
Hydralazine	12	S	Nevirapine (NVP)	6v	S
Hydrochlorothiazide	12	E	Niclosamide	6b	E
Hydrocortisone	3	E	Nifedipine	12	E
Hydrocortisone cream	13	E	Nitrofurantoin	6b	E
Hydrogen Peroxide	15	E	Norfloxacin	6b	E*
Ibuprofen	2	E	Nystatin	6f	E
Implanon	18	E	Omeprazole	17	E
Indomethacin	2	E	ORS	26	E
Influenza vaccine	19	i	Oxygen	1	E

Name of drug	WHO cat	MTC cat
Oxytocin	22	E
Paracetamol	2	E
Penicillin V	6b	E
Phenobarbital	5	C
Phenytoin	5	C
Podophylline	13	E
Polio vaccine (OPV-oral)	19	E
Potassium chloride	26	E
Povidone iodine	15	E
Praziquantel	6b	E
Prednisolone	3	E
Primaquine	6p	E
Procaine penicillin G	6b	S
Propranolol	12	E
PTU (propylthiouracil)	18	E
Pyrantel	6p	E
Pyrazinamide (Z)	6b	i
Pyridoxine (vit B6)	27	E
Quinine	6p	E
Rabies immunoglobulin	19	i
Rabies vaccine	19	i
Red blood cell	11	E
Rifampicin (R)	6b	i
Salbutamol	25	E
Silver Sulphadiazine	13	E
Simvastatin	12	i
Sodium Valproate	5	C
Spironolactone	12	E
Stavudine D4T	6v	S
Streptomycin (S)	6b	i
Tenofovir	6v	S
Tetanus immunoglobulin	19	i
Tetracaine	21	E
Tetracycline TEO	21	E
Theophylline	29	i
Thyroxine	18	E
Tramadol	2	E
Trihexyphenidyl (Artane)	9	S
Tuberculin	19	i
Valacyclovir	6v	i
Vitamin A (retinol)	27	E

Name of drug	WHO cat	MTC cat
Vitamin B Complex	27	E*
Vitamin B1 (thiamine)	27	E
Vitamin B12	10	E
Vitamin K1	27	E*
Warfarin	10	i
White paraffin (vaseline)	13	E*
Zidovudine (AZT)	6v	S
Zinc	27	E



## APPENDIX 1 DISEASES IN PICTURES

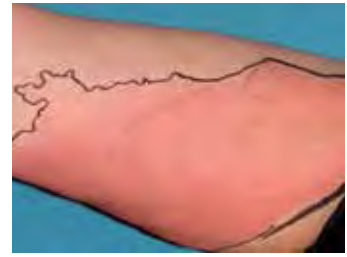
## SKIN DISEASE:



IMPETIGO



ABSCESS



CELLULITIS



ERYSIPELAS



ORAL CANDIDA



RINGWORM



HERPES SIMPLEX



CHICKENPOX



SHINGLES



SCABIES

CUTANEOUS LARVA MIGRANS  
(ANIMAL HOOKWORK)

LARVA CURRENS



URTICARIAL RASH



ECZEMA



ECZEMA HERPETICUM



PSORIASIS



LEPROSY



MEASLES

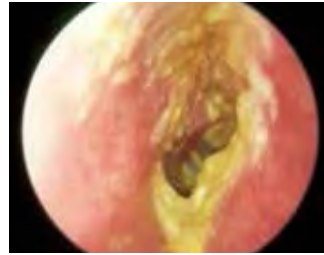
## EAR DISEASE:



NORMAL EAR DRUM



OTITIS EXTERNA

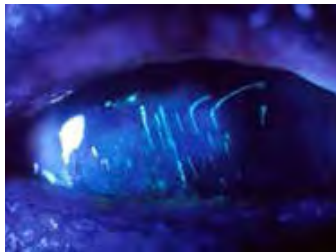


ACUTE OTITIS MEDIA



CHRONIC (SUPPURATIVE) OTITIS

## EYE DISEASE:



SCRATCHES ON THE EYE SHOWING UP WITH FLUORESCEIN DYE



CORNEAL ULCER SHOWING UP WITH FLUORESCEIN DYE



CATARACT



PTERYGIUM



CONJUNCTIVITIS

## UPPER RESPIRATORY TRACT DISEASE:



GREY MEMBRANE TYPICAL IN DIPHTHERIA



TONSILLITIS



PERI TONSILLAR ABSCESS WITH DISPLACED UVULA



## 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 intumed 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 (x2 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 0.5 mm 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).*

**TRACHOMATOUS SCARRING (TS):** the presence of scarring in the tarsal conjunctiva.

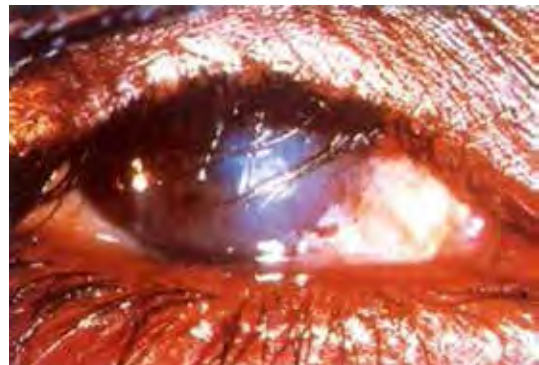
Scars are easily visible as white lines, bands, or sheets in the tarsal conjunctiva. They are glistening and fibrous in appearance. Scarring, especially diffuse fibrosis, may obscure the tarsal blood vessels.



*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)*

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**TF:-give topical treatment (e.g. tetracycline 1%).**

**TI:-give topical and consider systemic treatment.**

**TT:-refer for eyelid surgery.**

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**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 2: SURVEILLANCE AND OUTBREAK

A health surveillance system has been introduced in the border camps for displaced populations on the Thailand/ Myanmar border. For more information, see Health Information System (HIS) and CCSDPT Surveillance information.

**OBJECTIVES** of this system are:

1. To monitor disease trends in border camps in Thailand.
2. To detect disease outbreaks in border camps in Thailand.
3. To institute timely prevention and control measures of diseases in border camps in Thailand.

### CURRENT DISEASES UNDER SURVEILLANCE

The system is passive surveillance from which health service centres in border camps notify regularly to district health office, provincial health office and the Bureau of Epidemiology. The notification has been classified into the 3 categories below.

The followings diseases need to be reported urgently:

1. Severe atypical pneumonia
2. Cholera
3. Measles
4. Acute Flaccid Paralysis (AFP)/ suspected Poliomyelitis
5. Meningitis/encephalitis
6. Severe case/death of unknown cause from any suspected infectious cause

**URGENT REPORT  
SEE APPENDIX**

The following diseases need to be reported weekly if the numbers are above a particular threshold:

1. Influenza like illness (ILI)
2. Dengue Infection
3. Watery diarrhoea
4. Dysentery (bloody diarrhoea)
5. Malaria
6. Leptospirosis

**SURVEILLANCE  
DEPENDING ON  
NUMBERS  
See appendix**

The following diseases need to be reported weekly if they occur:

1. Cluster of disease e.g. jaundice, fever with rash etc.
2. Suspected vaccine preventable diseases:
  - o Rubella
  - o Pertussis
  - o Diphtheria
  - o Mumps
  - o Neonatal Tetanus

**SURVEILLANCE  
See appendix**

**Note:** Surveillance diseases may change so keep up to date with the Health Information System and the Committee for Coordination of Services to Displaced Persons Thailand (CCSDPT)

### OUTBREAK

For a suspected disease cluster or an outbreak, notify the district health officer or provincial 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, fax or email the outbreak form to CCSDPT. Alternatively call the HIS programme (Email: [ccsdpt@inet.co.th](mailto:ccsdpt@inet.co.th) or [his@ccsdpt.org](mailto:his@ccsdpt.org) Phone: 053 279 536).

If an outbreak is imminent the HIS programme can assist in monitoring the outbreak through health mapping, daily or regular surveillance of the trends.

*For more information: see Health Information System.*

**CASE DEFINITIONS FOR SURVEILLANCE:**

1. **ACUTE DIARRHOEA:** Patient passing 3 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  $\geq 38.5^{\circ}\text{C}$  (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  $38.5^{\circ}\text{C}$  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. **MALARIA:** Patient with a positive malaria slide (PF, PV, PM or mixed).
12. **FILARIASIS:** Person with positive either *Wuchereria Bancrofti* or *Brugia Malayi* by laboratory test.
13. **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.
14. **MENINGITIS:** Patient who presents with sudden onset of fever  $>38^{\circ}\text{C}$  (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 purpurial rash and at least one of the following: neck stiffness, altered consciousness, other meningeal sign or laboratory confirmed.
15. **ENCEPHALITIS:** Patient with fever and negative malaria slide and altered consciousness, with headache or convulsion.
16. **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.
17. **STD:** one of: Urethral discharge OR Abnormal Vaginal discharge excluding Candidiasis OR 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  $>38^{\circ}\text{C}$ .

## APPENDIX 3 - CHARTS

TABLE 1: HB (LOVIBOND) WITH HCT EQUIVALENTS

HAEMOGLOBIN WITH LOVIBOND METHOD WITH HAEMATOCRIT EQUIVALENTS

READING ON DISC	g/100ml	SEVERITY	HAEMATOCRIT EQUIVALENT
20	3.3	+++	10
24	4.0		12
28	4.7		14
32	5.3	++	16
36	6.0		18
40	6.7		20
46	7.3	+	22
52	8.7		26
58	9.7		29
64	10.7		32
70	11.7	0	35
76	12.7		38
84	14.0		42
92	15.3		46
100	16.7		50
110	18.3		55
120	20.0		60
130	21.7		65

TABLE 2: HCT EQUIVALENT FOR AGE

Age	Sex	Hct
0 to <2wks (term baby)	Female or Male	47-75
2wks to <2mths	Female or Male	28-65
2wks 2mths		41-65 28-42
2mths to <6mths	Female or Male	28-42
6mths to <2yrs	Female or Male	33-39
2yrs to 6yrs	Female or Male	34-40
7yrs to 12 yrs	Female or Male	35-45
13yrs to 18yrs	Female	36-46
13yrs to 18yrs	Male	37-50
>18yrs	Female	36-46
>18yrs	Male	41-53



**TABLE 3: PEAK FLOW NORMAL VALUES**

<b>MEN</b>													
HEIGHT in cm	157	160	162	165	167	170	172	175	177	180	182	185	187
AGE in years													
15	525	525	525	525	530	535	535	540	545	545	550	555	560
20	565	570	575	580	580	585	585	590	595	595	600	605	610
25	590	600	605	605	610	615	615	620	625	630	630	635	640
30	605	610	615	620	620	625	630	635	640	640	645	650	650
35	610	615	620	620	625	625	630	635	640	640	645	650	650
40	600	605	615	615	615	620	625	630	630	635	635	640	645
45	585	595	600	600	605	610	610	615	615	620	625	630	635
50	570	575	585	585	590	590	595	600	600	605	610	610	615
55	560	565	570	575	575	580	585	590	590	595	600	605	605
60	550	555	560	560	565	570	570	575	580	585	590	600	600
65	540	545	550	550	555	560	560	565	570	575	580	590	590
70	530	535	540	540	545	550	550	555	560	565	570	575	580

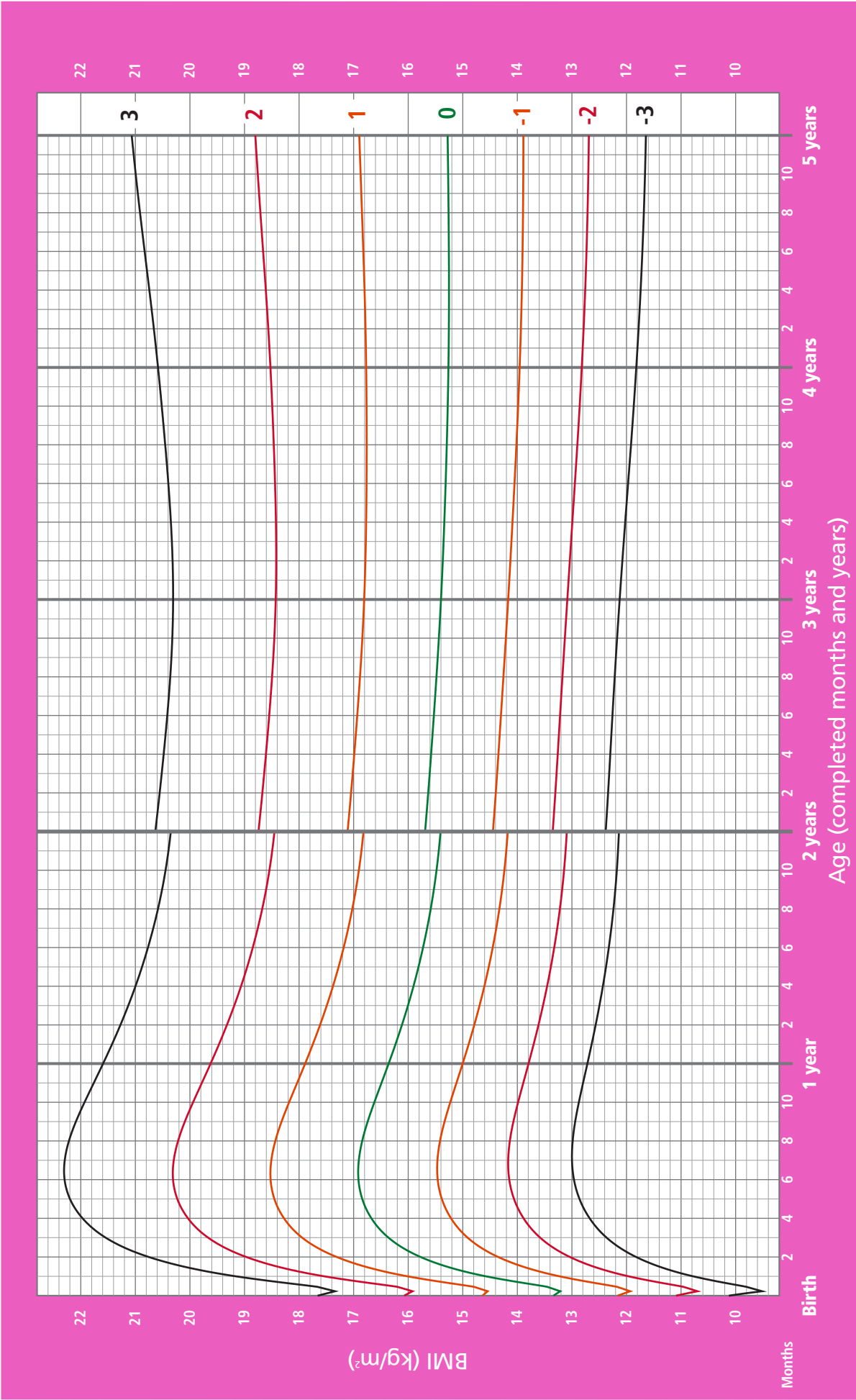
<b>WOMEN</b>													
HEIGHT in cm	147	150	152	155	157	160	162	165	167	170	172	175	177
AGE in years													
15	435	440	450	455	455	460	465	465	470	475	475	480	485
20	450	450	455	460	460	465	470	475	480	480	485	490	490
25	450	455	460	460	465	470	475	480	480	485	490	490	495
30	455	455	460	465	470	475	480	480	485	490	490	495	500
35	455	455	460	465	470	475	480	480	485	490	490	495	500
40	450	450	455	460	465	470	475	480	480	485	490	490	495
45	445	450	450	460	460	465	470	475	475	480	485	485	490
50	440	440	445	450	455	460	460	460	470	470	475	480	480
55	430	430	435	440	445	450	450	455	460	460	465	470	470
60	415	420	425	430	430	435	440	445	450	455	455	460	460
65	400	405	410	415	415	420	435	430	435	440	445	445	450
70	390	390	395	400	400	405	410	410	415	420	425	430	440

# BMI-for-age GIRLS



TABLE 4: BODY MASS INDEX 5 TO 19 YEARS

Birth to 5 years (z-scores)

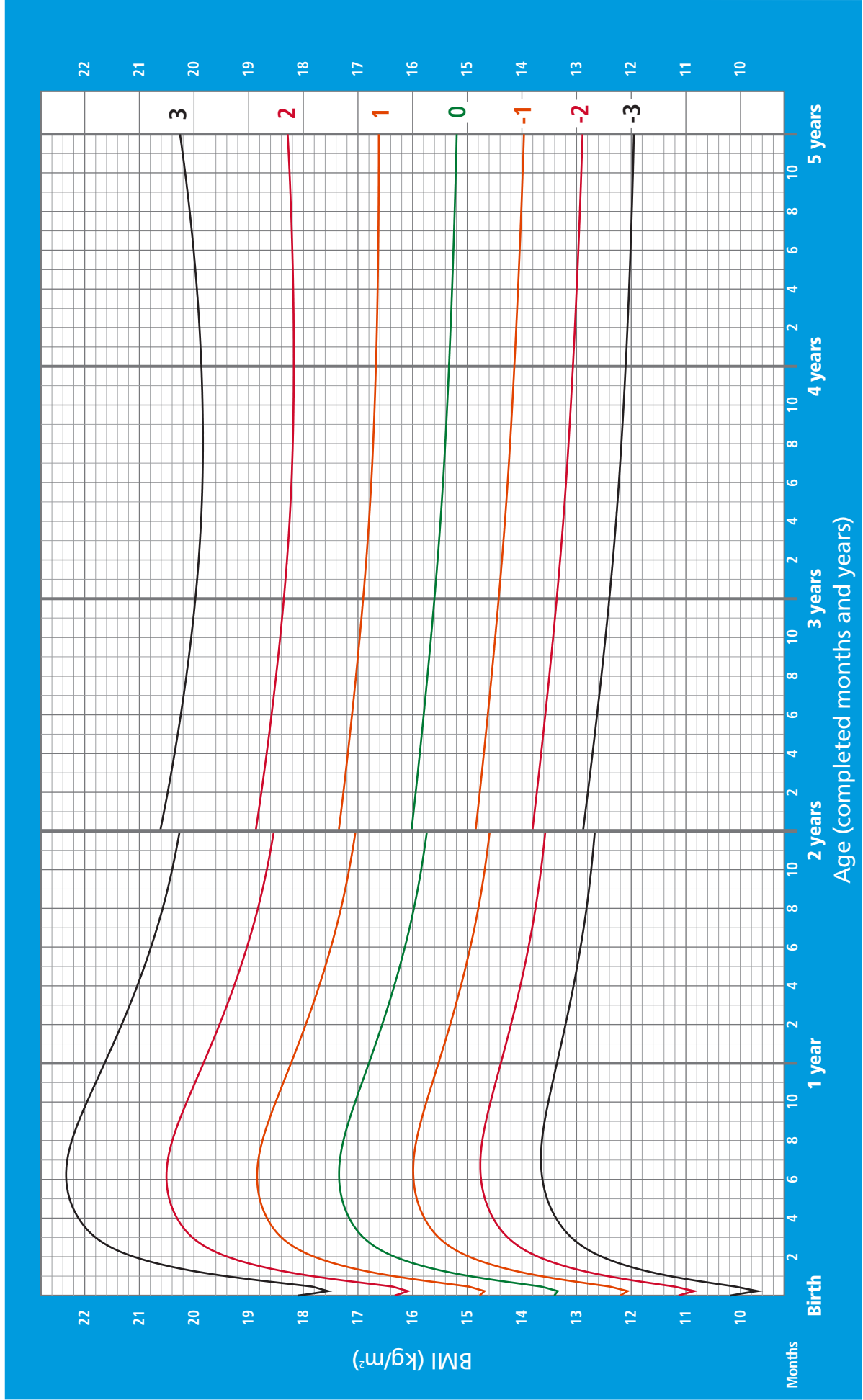


WHO Child Growth Standards



# BMI-for-age BOYS

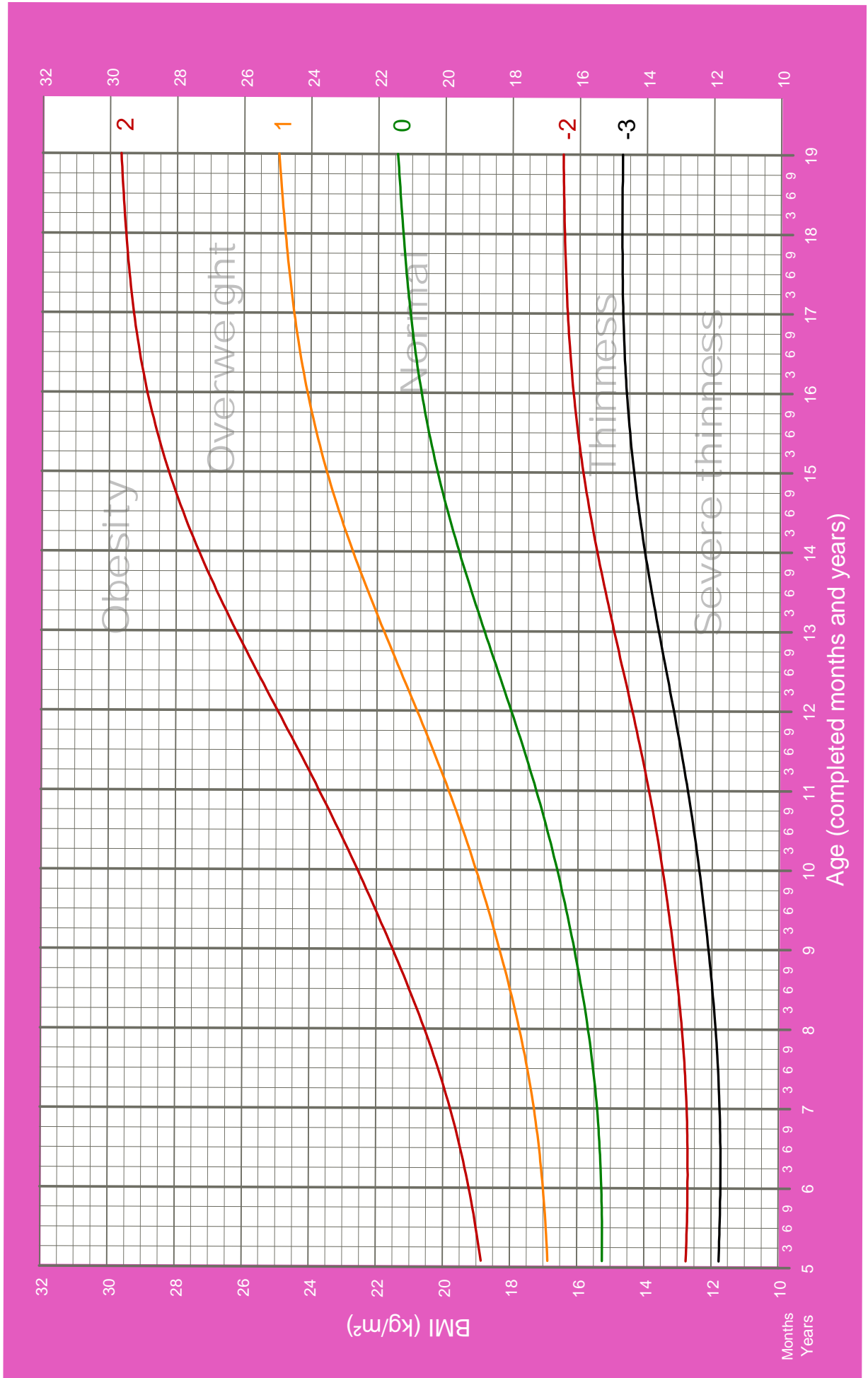
Birth to 5 years (z-scores)



WHO Child Growth Standards

# BMI-for-age GIRLS

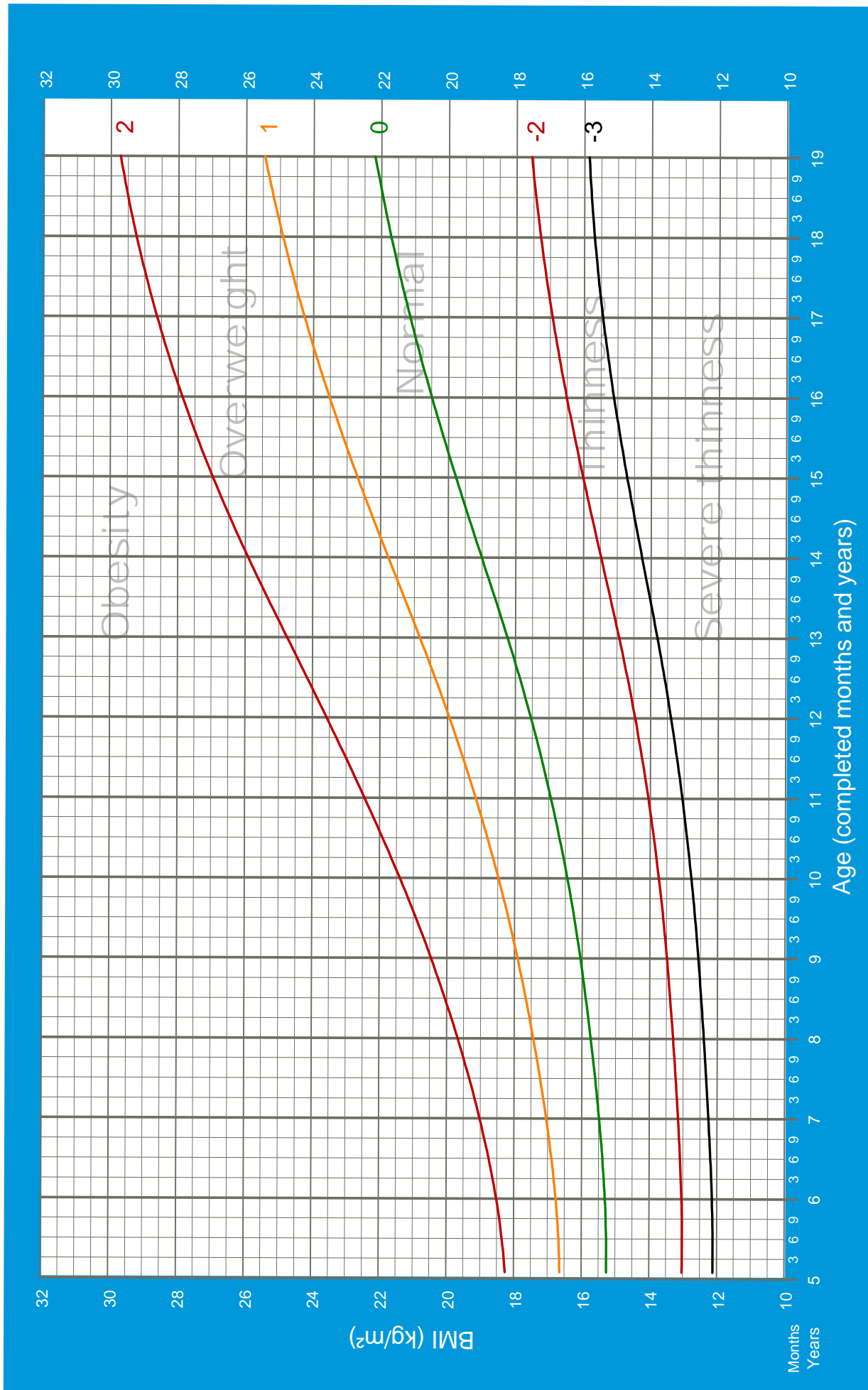
5 to 19 years (z-scores)



2007 WHO Reference

# BMI-for-age BOYS

5 to 19 years (z-scores)



## APPENDIX 4: ORAL REHYDRATION SOLUTION PREPARATION

### ORS

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#### 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.

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### Dilute ORS

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#### HOW TO MAKE DILUTE ORAL REHYDRATION SOLUTION

1 packet (size for 750ml water) of ORS powder + **1.5L** clean water  
+ 30g sugar + 1.5g potassium

OR

1 packet (size for 1L water) of ORS powder + **2L** clean water  
+ 40g sugar + 2.5g potassium

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### Sugar Salt Solution

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#### 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 5ml 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 (240ml)

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.

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### Boiled Rice Water

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#### 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.

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Burmese Border Guidelines

2016

