Burmese Border Guidelines

2007

BBG

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BURMESE BORDER GUIDELINES

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1 ABOUT THIS 4TH EDITION

The Burmese Border Clinical Guidelines are specifically designed to assist medics and health workers practising along the Thailand/ Burma border. They have been adapted from the international treatment guidelines and medical literature of the World Health Organisation (WHO) and Non-Governmental Organisations (NGOs) that focus on common diseases present on the Thailand/ Burma border. Every effort has been made to incorporate the experiences of the local medics and health providers who have been working in the refugee camps and communities on the border for the last twenty years. The language is in simple English.

About these Guidelines compared to the last edition, BBG 2003

- Medics have been involved in proofreading draft chapters and to simplify the English language. Medical terminology is explained in common terms.
- Where possible chapters are set up in a fixed format: DEFINITION, SIGNS AND SYMPTOMS, DIAGNOSIS, TREATMENT, PREVENTION, VACCINATION, REFERENCES.
- **New sections** (chapters or paragraphs) have been included in response to requests of the medics: universal precautions, epigastric pain, headache, thyroid diseases, eye diseases, cholera, liver diseases, filariasis, poliomyelitis, tetanus, encephalitis, rabies, osteomyelitis, obesity, gender based violence, palliative care, avian influenza, some skin diseases and betel nut abuse. In the appendix, the 'weight for height' indexes are updated with Z scores. A BMI (Body Mass Index) table, an ORS preparation page, Cardio-Pulmonary Resuscitation guidelines and a Newborn and Infant Guideline are included in the appendix of this book.
- All sections have been **reviewed** and some therapeutic **protocols have been changed** according to updated patterns of resistance or reviewed international guidelines (Heart Failure, Epilepsy, Diabetes Mellitus, Malaria, Meningitis, UTI, Reproductive Tract Infections, Mental Health, Obstetric problems, Respiratory Diseases, Skin Diseases).
- Recently a surveillance system of important diseases has been introduced in the health system on the Thailand/ Burma Border. In these Guidelines, diseases under surveillance are highlighted with a SURVEILLANCE mark.

SURVEILLANCE
See appendix

URGENT REPORT
See appendix

Diseases that need urgent reporting are highlighted as well.
See chapter 24.1 and the Health Information System for more details.

- The existing **drug doses tables** have been updated and reviewed. Some drugs have been added (e.g. Ceftriaxone for meningitis and STI, Nitrofurantoin for UTI), some drug doses have been changed (e.g. Gentamicin)
- Finally, a **table of contents** and an **index** have been created to make chapters easier to find in this 4th edition of the Burma Border Guidelines.

Despite the efforts brought to this project, errors may have occured in the text. The authors invite the users to inform them of any errors and would be grateful for any comments or suggestions.
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HOW TO USE THE GUIDELINES 2

These guidelines should not replace clinical decision-making, but should act as an aid in confirming a diagnosis when you already have an idea of the patient's disease. These guidelines have been adapted from medical reference books and are simplified for use in the context of refugee camps and peripheral clinics on the Thailand/ Burma border, and therefore may not be 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 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. Read the **TABLES** for the medicine that you have chosen in order to find the correct dose according to the age or weight of the patient. Here you will find contra indications and warnings for use of medicines.

Abbreviations used:

mg	= Milligram	**X**	= Times	**PV**	= per vagina
g	= Gram	**/**	= Per	**SC**	= subcutaneous
kg	= Kilogram	**Tab**	= Tablet	**STAT**	= single dose
ml	= Millilitre	**PO**	= per os (oral)	**OD**	= one time a day
cc	= cubic centimetre	**IM**	= intramuscular	**BID**	= 2 times a day/12 hourly
d	= Day	**IV**	= intravenous	**TID**	= 3 times a day/8 hourly
mn	= Minute	**PR**	= per rectum	**QID**	= 4 times a day/6 hourly

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

AFB	= Acid Fast Bacilli	**OPD**	= Out-Patient Department
AIDS	= Acquired Immuno Deficiency Syndrome	**ORS**	= Oral Rehydration Salts
ANC	= Ante Natal Care	**PFG**	= Plasmodium Falciparum Gametocytes
ARI	= Acute Respiratory Infection	**PFT**	= Plasmodium Falciparum Trophozoites
BP	= Blood Pressure	**PR**	= Pulse Rate
CRP	= C - Reactive Protein	**PVG**	= Plasmodium Vivax Gametocytes
D5W	= Dextrose 5% and Saline/Water	**PVT**	= Plasmodium Vivax Trophozoites
ESR	= Erythrocyte Sedimentation Rate	**R/L**	= Ringers Lactate
Hb	= Haemoglobin	**RR**	= Respiratory Rate
Hct	= Haematocrit	**SFP**	= Supplementary Feeding Program
HIV	= Human Immuno-deficiency Virus	**TB**	= Tuberculosis
IPD	= In-Patient Department	**TFP**	= Therapeutic Feeding Program
LRTI	= Lower Respiratory Tract Infection	**URTI**	= Upper Respiratory Tract Infection
MS	= Malaria Smear	**UTI**	= Urinary Tract Infection
NSS	= Normal Saline Solution		

3 TABLE OF CONTENTS

3 TABLE OF CONTENTS

4 APPROACHING PATIENTS

Treating the patient in a kind and respectful way is very important to successful care. 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 sit down. If they are very sick, let the patient lie down on a bed.

3. Give the patient privacy:
   - Make sure nobody else can overhear or see the patient during the examination.
   - 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.
   - Do not allow other people to overhear the complaints of the patient.
   - Take special (privacy) care when doing a gynaecological or genital examination.

4. Check for **DANGER SIGNS***. If the patient shows any danger signs then provide urgent and immediate treatment, consult the doctor and admit to IPD or refer to a Thai hospital.

5. Ask the patient about the main complaint and common conditions. Take a detailed medical history of the patient. Ask about recent illness and treatment and look at their record book (lemma). This is very important when, for example, many courses of antibiotics have been given. (When a patient has no lemma or a new lemma, ask where the old one is - have they lost it? Take a detailed medical history and write this down in the new lemma).

6. Examine the patient thoroughly. Check that their weight and temperature are recorded on the lemma.

7. Classify the patient's illness as to whether they need: a) urgent IPD admission/ referral, b) OPD medical treatment and advice, or c) simple advice on home care (no medication).

8. Write down briefly the patient's complaints, examination, and laboratory findings on the lemma. Then write down clearly the diagnosis and the treatment on the lemma.

9. Explain to the patient 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.

10. If the patient needs urgent referral, give any essential treatment before the patient is sent.

11. Give **preventive*** or screening care.
E.g. for children < 5 years old, check their immunisation status and for signs of malnutrition or anaemia.

12. If the patient is to receive OPD medical treatment and advice, then give them practical instructions on how to take the treatment at home. 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 dose. Give advice on foods and fluids during illness, and how to treat local infections at home. Consider whether supervised treatment is needed.

13. Give **follow-up care***. Ask the patient to return for a follow-up OPD visit, if needed (give a specific date). Also teach the patient and/or the parents 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.

For example: 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. If you diagnose a child with watery diarrhoea, tell the parents to return if the patient develops signs of dehydration.

14. 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 by different age groups of what 'danger signs', 'preventive care', 'follow-up care', mean.**

SUMMARY STEPS TO PROVIDING PATIENT CARE

Assess for emergency or DANGER signs. If patient has any: give immediate treatment (consult doctor, admit to IPD or refer to hospital)	See the section below for **Danger signs**
Assess the patient's main complaint or acute illness	
Perform an adequate physical examination, and carry out careful investigation	
Make a list of possible diagnoses and select the most likely	
Classify the patient as to whether they need: 1. IPD admission or referral 2. OPD treatment 3. Home care and education (no medication)	
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 **Preventive 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**

4 APPROACHING PATIENTS

DANGER SIGNS

All ages:
For these signs provide immediate treatment (and consult the doctor, admit to IPD or refer to a hospital).

First assess **Airway and Breathing:**

Airway is obstructed or Central cyanosis (blue lips) or Severe respiratory distress or difficulty breathing	Open airway, give oxygen. **See 7.1 (coma) and 21 (respiratory diseases)**

Then **Circulation (shock):**

Weak and fast pulse, low BP or Capillary refill longer than 2 seconds	IV line, give IV fluids. **See 7.6(Shock)**

Unconsciousness / convulsions:

Convulsions (now or recently) or Unconsciousness (if so, was there a recent convulsion?)	**See 7.1, 7.2 (Coma and Convulsions)**

Pain:

If chest pain: What type of pain? (check for heart or lung problem) If severe abdomen pain: Is the abdomen hard? (check for peritonitis) If neck pain or severe headache: Has there been any trauma? High BP? (check for trauma, HBP and neurological problems)	**See 7.5 (Pain) and 8** (**Cardiovascular** diseases)

Fever from life threatening cause:

Any fever with: Stiff neck, Very weak condition, Unconsciousness, Convulsions, Severe abdomen pain, Respiratory distress	**See 7.4 (Fever)**

Psychiatric or aggressive patient

See 18 (Mental Health)

Major Trauma

SPECIFIC DANGER SIGNS: FOR CHILDREN GREATER THAN 2 MONTHS

See DANGER SIGNS for all ages. The signs below are specific to young children.
Provide immediate treatment and consult the doctor or admit to IPD or refer to hospital.

General danger signs:

Not able to drink or breastfeed
Persistent vomiting
Lethargic or unconscious
Convulsions

Respiratory danger signs:

Fast breathing
Difficulty breathing
Severe chest indrawing
Stridor in a calm child

Open airway, give oxygen.
See 21 (respiratory diseases)

Diarrhoea danger signs:

Dehydration
Blood in stool
Diarrhoea for more than 14 days

See 12.1 (Diarrhoea)

SPECIFIC DANGER SIGNS: FOR YOUNG INFANT UNDER 2 MONTHS OLD

Provide immediate treatment (and consult the doctor, admit to IPD or refer to hospital)

Any signs of possible bacterial infection, these include:

- Unable to breast-feed
- Fever (temp > 38°C) or Hypothermia (Temp less than 36 °C)
- Convulsions, drowsiness or unconsciousness
- Respiratory rate of less than 20/min, or more than 60/min
- Grunting
- Severe chest indrawing
- Nasal flaring
- Central cyanosis
- Offensive / smelly wet umbilical cord
- Bulging fontanel
- Skin pustules

See appendix
Newborn and Infant Guidelines

PREVENTIVE 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 patients with cardiovascular diseases or DM) on lifestyle changes (**see 8 and 10.1**).
- Advise patients (especially patients 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 14.1**).

For children under 5 years assess at every visit

- Ask if the child has been immunised. If not, give immunisations (or ask the mother to come to the next immunisation session and tell her when it will be).
- Check when the child last took vitamin A. If none taken in the last 4 months, provide appropriate treatment.
- Assess for signs anaemia and provide appropriate care.
- Nutrition status: assess feeding or breast feeding practices, and explain how to solve any feeding problems.
- Use the weight for height card (see appendix).

FOLLOW UP CARE - RECOMMENDATIONS

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 and return if the condition does not improve, 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.
- The patient should not receive more than 3 months supply of medicine and should be advised to return before they run out.

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

- 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.

UNIVERSAL PRECAUTIONS 5

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 to needle prick injuries and splashes of body fluids into the eyes, mouth etc. These areas can be protected to some degree, 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 on removal of 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.

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.

- 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.

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.

5 UNIVERSAL PRECAUTIONS

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.

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 with the next patient.

SHARPS

- Never re-use needles. Avoid recapping needles.
- Discard contaminated disposable sharps in puncture resistant and liquid proof containers immediately.
- The precise location of sharp 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.

CLEANING ROUTINE

- Routinely clean and disinfect frequently touched surfaces including beds, bed rails, patient examination tables and bedside tables. Always use gloves when cleaning. Cleanse 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.

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 (**6**).

POST EXPOSURE PROPHYLAXIS 6

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 prevent HIV infection. To prevent hepatitis B disease a vaccination can be given (see below).
PEP is a 28-day course of antiretrovirals (ARV) that reduces the likelihood of HIV transmission after exposure to a possible HIV positive source. The provision of 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.

BACKGROUND

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

- Blood
- Sperm, vaginal fluids
- Amniotic fluid (important for midwifes)
- Ascites, pleural fluids, pus.

HIV is NOT found in:

- Sweat
- Saliva

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 whilst emptying the needle container).
- A splash of fluid in the eyes or mouth.
- Blood or body fluids 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).

HIV is not transmitted by talking, touching, kissing, or using the same toilet.

What to do after being exposed to somebody's blood or fluids

First aid

- When there is a wound (e.g. needle stick), 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 (**20.3**).

Risk assessment

This should be done together with the PEP focal point or other experienced person. Some exposures

carry a greater risk of HIV transmission than others. The level of risk will determine the management. Refer to your agency's PEP Guidelines for further information on risk assessment of exposures.

If the source is a patient and it is not known whether the source person is HIV infected, ask if he or she agrees to do a rapid HIV-test. Testing of source persons should only take place after obtaining informed consent, and should include appropriate counselling, care and referral. Confidentiality must be maintained. If the patient has already left, consider the likelihood that this patient had HIV.

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).

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

PEP treatment is a combination therapy of ARVs for a period of 4 weeks. The number and type of ARVs 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 (ZVD) or lamivudine in the source person are:

- **ZDV** 250-300mg twice a day.
- **Lamivudine** 150 mg twice a day.
- If a third drug is to be added, this may be either **Indinavir** 800 mg 3 times a day or **Efavirenz** 600 mg once daily (not recommended for use in pregnant women).

The number and combination of drugs should be chosen with regard to the health agency's protocol. 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 ARV therapy once PEP is begun. In some camps 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.

Hepatitis B and C

Exposure to blood and body fluids also carries a risk for hepatitis B and hepatitis C infection. Hepatitis virus causes inflammation of the liver (**12.3**). Currently there is no vaccine available for hepatitis C. Hepatitis B vaccine should be given if the person has not been previously vaccinated.

Hepatitis B vaccination

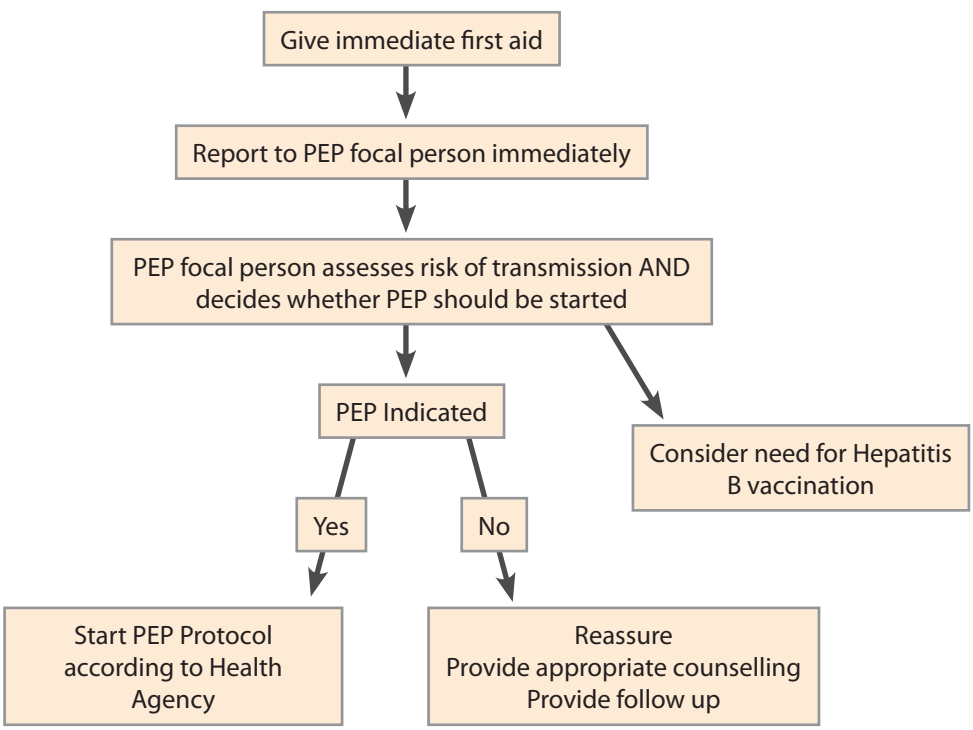
- If the person's last hepatitis B vaccination was more than 10 years ago a hepatitis B booster vaccination is recommended.
- If the person is not vaccinated against hepatitis B, then hepatitis B vaccine should be given at the time of exposure, then at intervals of 1 month and 6 months after the exposure.

FOLLOW UP

- Provide psychological support.
- During a confidential meeting with the exposed person, the following points should be discussed:
  - The risk of transmission after accidental exposure to blood is estimated at 0.3% (3 in 1000). The risk is similar in unprotected sex with an 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.
  - It is recommended that the exposed person be tested for HIV within 8 days after the exposure (to make sure that he or she was not already HIV positive). Full pre/post test counselling and informed consent should also take place. The HIV test is voluntary. **PEP should never be withheld because an HIV has not been done.** If the exposed person does not want to have a HIV test PEP can still be given.
  - After that, a HIV test should be done after 3 months, and if negative, again after 6 months. If the HIV test after 6 months is still negative, then it is sure that there has been no HIV transmission.
  - Until the result of this last test at 6 months is known, the exposed person should not have unprotected sex, and should not donate any blood.
  - 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.

FLOW CHART

Accidental exposure to blood or potentially infectious body fluids



7 COMMON SYMPTOMS

7.1 COMA

DEFINITION

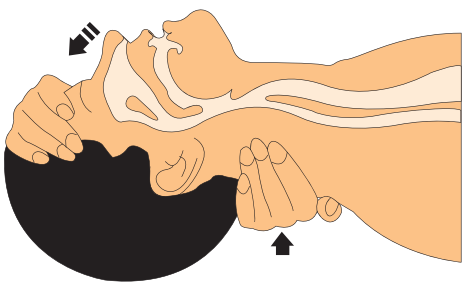
Reduced level of consciousness. There are different degrees of reduced level of consciousness and coma is the most severe.

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

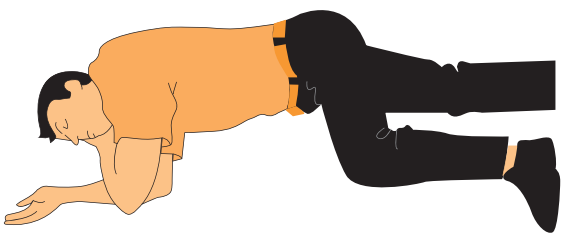
Several definitions and scales are used. In this guideline we use the Glasgow Coma Scale.

EMERGENCY TREATMENT

1) **Clear Airway** The 'chin lift' method is often sufficient to ensure adequate air entry and exit. Be aware of the possibility of neck injury. Handle the patient with care and always keep the neck in an outstretched position. If available, use a cervical collar and consider that every patient potentially has a neck injury. Check that nothing is obstructing the throat by using your fingers as a hook and removing any foreign body.



2) **Coma Position** Put the patient on his side as shown in the following drawing. One leg is bent at the knee. If the coma is following a trauma, handle the patient with care and keep the spine straight when turning him on his side. This position prevents the patient from swallowing his tongue or drowning in his own vomit.



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 Cardio Pulmonary Resuscitation (see **292**).

3) Check vital signs (pulse, blood pressure, respiratory rate, temperature), blood sugar, malaria smear and haemoglobin/haematocrit. If signs of shock, see shock (**7.6**).

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/ Blantyre Coma Scale.
  - Check the pupils; if they are of different sizes consider cerebral haemorrhage. Refer to hospital according to your agency policy (**see stroke, 8.3**).
  - Check that the tonus 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: cyanosis, jaundice, pallor.

Glasgow Coma Scale	**Score**	**Blantyre Coma Scale (child < 5 year)**	**Score**
• **Best Motor response**		• **Best Motor response**	
– Obeying commands	5	– Localises painful stimulus	2
– Localising pain stimulus	4	– Withdraws limb from pain	1
– Flexing	3	– Non-specific or absent response	0
– Extending	2		
– None	1		
• **Best Verbal response**		• **Best Verbal response**	
– Oriented	5	– Appropriate cry	2
– Confused	4	– Moan or inappropriate cry	1
– Inappropriate words	3	– None	0
– Incomprehensible sounds	2		
– None	1		
• **Eye opening**		• **Eye movements**	
– Spontaneous	4	– Directed	1
– To speech	3	– Not directed	0
– To pain	2		
– None	1		

Total score is between 3 and 14:	Total score is between 0 and 5:
• A score below 5 suggests poor outcome depending on cause, especially in trauma. • A score below 8 indicated severe coma.	• A score below 2 indicates coma.

DIAGNOSIS

LOOK FOR A POSSIBLE CAUSE AND TREAT IT

	Possible Cause	Chapter
Coma with fever	malaria, meningitis, encephalitis, sepsis, or other severe infections	**15.2, 15.1, 15.3,**
Coma with or without fever	Hypoglycaemia (dextrose <3.8 mmol or 70 mg/100ml) Severe dehydration	**10.1**
Coma without fever	Cranial trauma (accident), poisoning, cerebral haemorrhage	**8.3**

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, refer 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 an IV line and urine catheter. Monitor fluid balance (input/output) in order to avoid dehydration.
3. DO NOT use dextrose 5% during the first 48 hours if coma is following a head trauma (sugar can worsen the brain damage) **except** in hypoglycaemic patients.
4. Regularly reassess the patient: check the vital signs every 2 hours.
5. Check coma score 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 terramycine eye ointment BID to avoid conjunctivitis, drying up of cornea, and injury. Drying up of cornea can lead to blindness. Close the eyes with a plaster 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 contraction. In some clinics 'Handicap International' could help mobilisation.
11. In prolonged coma consider N/G feeding depending on the cause and prognosis (**see malnutrition 17.1**). Ask the family not to leave the patient alone.

REFERENCES See above.

7.2 CONVULSIONS

DEFINITION

Convulsions are **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 ½ hour. Return to full consciousness is progressive and the patient may be disoriented, asking the same questions many times (about what happened to him/her, where he/she is etc). In small babies strong arm or leg movements might be absent, look for eyes or mouth movements.

EMERGENCY TREATMENT

1. Put in **coma position** (lying on left side) and in a quiet safe place to **protect** him against injury.

2. Maintain a **clear upper airway** (open the mouth and clean out secretions and vomit).

3. Give IV 50% dextrose bolus unless hypoglycaemia is excluded.

4. Give **diazepam** (See table below) to stop the convulsions or prevent another crisis:
When the patient is moving, it can be easier to give first dose IM or PR.

5. Give **oxygen** and suction if available.

Table: Diazepam Injection 1 vial = 10 mg / 2cc

Weight	Dose IV (0.3 mg/kg)	10 mg / 2cc
<4 kg	1 mg	0.2 cc
4-8 kg	2 mg	0.4 cc
9-15 kg	4 mg	0.8 cc
16-35 kg	7.5 mg	1.5 cc
> 35 kg	10-20 mg	1-2 vial

Give IV injections SLOWLY (max 0.5 cc in 30 seconds).

Diazepam Rectally (PR) or IM

Age/Weight	Dose PR (0.5 mg/kg)	10 mg / 2cc
2weeks - 2 months <4 kg	2.5 mg	0.3 cc
2-<4 months (4-<6kg)	2.5 mg	0.5 cc
4-<12 months (6-<10kg)	5 mg	1 cc
1-<3years (10-<14kg)	6.25 mg	1.25 cc
3-<5years (14-19kg)	7.5 mg	1.5 cc
>5 years	10-20 mg	1-2 vial

Give diazepam rectally:

- Draw up the dose from an ampoule of diazepam into a 1cc syringe
- Base the dose on the weight of the child, where possible
- 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

Diazepam IR or IM is NOT diluted. Maximum daily dose: 3 mg/kg

6. **Repeat the dose** after 10 min if the patient still has convulsions. Give a third dose if the convulsions remain after another 10 minutes.

7. If convulsions continue after a third dose give **phenobarbital** IV slowly:
   - ➔ 1 ampoule: 200 mg / 2 ml to dilute in 20 cc (10 mg / ml)
   - ➔ Dose: Child 15 mg/kg and Adult 10 mg/kg
   - ➔ Do not leave phenobarbital in a plastic syringe because it might stick on its walls.

8. **Refer to Thai hospital** if the patient continues to have fits after phenobarbital injection.

Remember

After several doses of diazepam or phenobarbital, the patient will be asleep and cannot be woken for a while.

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)

		Chapter
Convulsions with fever	Malaria, meningitis, hyperthermia, encephalitis	**15.2, 15.1, 19, 15.3**
Convulsions with or without fever	Hypoglycaemia, severe dehydration, head trauma, amphetamines, alcohol, renal failure (uraemia)	**10.1, 8.3, 23.1**
Convulsions in pregnant women	Eclampsia (HBP + oedema + proteinuria), malaria, hypoglycaemia	**19.5, 15.2, 10.1**
Repeated convulsions without fever	Brain tumour, cysticercosis	**12.4**
Convulsions without a clear cause	Epilepsy	**20.1**

TREATMENT

Goals of treatment are:

- Stop convulsions quickly.
- Treat fever if present and > 39°C 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.

REFERENCES See above.

7.3 FATIGUE / TIREDNESS / NUMBNESS

DEFINITION

Fatigue, tiredness and numbness are common symptoms 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 and numbness do not go away with normal measures like sleep, rest and good diet, then they may be symptoms of disease.

SPIT: STORY, PHYSICAL EXAM, INVESTIGATION AND ASSESSMENT OF THE PSYCHOLOGICAL STATE, TREATMENT

STORY age, cough, weight loss, headache, malaise, difficulty breathing, fever, constipation, diarrhoea, vomiting, menstrual history (check for pregnancy), painful menstruation, muscle and joint pain or weakness, urine quantity and number of times passing urine in the night, peripheral numbness and tingling.
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.

PHYSICAL EXAMINATION
Weight, height. Check vital signs (Pulse rate, BP, temperature, respiratory rate), pallor, lymph nodes, pulmonary and cardiac (murmur, irregular rate) auscultation, thyroid, liver (does it feel enlarged, firm, hard) and spleen, any abdominal masses, observe patient walking (foot drop) and sitting.

INVESTIGATION

Urine glucose; thin smear (differential white or red blood cell count), HB or HCT, AFB if indicated; pregnancy test if indicated. In discussion with the doctor and only if indicated: full blood count, urea and electrolytes, liver function tests, thyroid stimulating hormone (TSH), chest x-ray (CXR), malaria smear.

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, 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 18.1**, for example).

LOOK FOR A CAUSE

POSSIBLE CAUSES	SYMPTOMS	Chapter
Infections (viral, HIV, TB etc)	Enlarged painful lymphnodes, fever	**15**
Anaemia (iron deficiency, thalassaemia)	Pallor (enlarged spleen)	**14.1**
Hypothyroidism	Lethargy, constipation, stiffness, weight gain	**10.2**
Pregnancy	Tiredness, nausea, dizziness	**19**
Diabetes mellitus	Passing urine very often, weight loss, thirsty	**10.1**
Lung disease	Difficulty in breathing	**21**
Heart problems (heart failure, valvular heart disease, pericardial disease, arrhythmias)	Difficulty in breathing, slow or fast pulse rate, oedema	**8**
Stomach and intestinal problems.	Diarrhoea, vomiting, nausea, epigastric pain	**12**
Cancer	Weight loss, enlarged lymph-nodes, pallor	**-**
Vitamin B1 deficiency (especially in pregnancy)	Numbness of limbs	**17.2**
Psychological problems	Depression, anxiety	**18**

PREVENTION

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

REFERENCES See above.

7.4 FEVER

DEFINITION

Fever means increase in body temperature. Axillary temperature more than 37.5ºC or 38ºC 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

For adults, temperatures should be taken in the axilla, oral cavity, ear canal or rectum. Proper measurement of axillary temperature takes 5 minutes. **For children under 1 year of age use a rectal thermometer**. (Clean thermometer with water and soap, and alcohol or chlorine solution). Use an electronic thermometer when available. Record temperatures taken in the axilla on the chart without any comment (e.g. 38ºC). If temperature is taken in other places like rectum or oral cavity, it should be marked (e.g. 38ºC (rectal)).

TREATMENT

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

Treat fever, when temperature is over 37.5ºC in Children and over 38ºC in Adults:

- Get the patient undressed (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 500mg - 1 gram QID (max 4 gram daily)
  Children 15 mg/kg (max 2 gram daily).
- Keep the patient well hydrated (drinking a lot, continuing to breast feed).
  Note: For patients with fever who are comatose and cannot swallow, it is possible to give paracetamol PR or IM.

Never give aspirin to children under 12 years

TRY TO FIND AND TREAT THE CAUSE OF THE FEVER

SYMPTOMS	POSSIBLE DISEASE	Chapter
Chills, headache, sweating, consciousness disorders	Malaria	**15.2**
Headache, neurological signs, neck stiffness	Meningitis	**15.1**
Respiratory signs	ARI	**21.1**
Urinary signs	Pyelonephritis	**13.1**
Diarrhoea with mucus and blood	Bacterial diarrhoea	**12.1**
Abscess, infected skin lesions	Skin infection	**22.2**
Shock, chills	Septicaemia	**7.6**
Painful big liver	Liver abscess	**12.3**
Prolonged high fever	Typhoid fever	**15.1**
Eschar, lymphadenopathy, rash	Scrub typhus	**15.1**
Prolonged fever with cough and weight loss	TB	**21.5**
Isolated fever, body pain, running nose	Viral Infections, common cold	**21.1**
Others	Cancer, HIV/AIDS	**15.3**

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.

SPECIAL CONDITIONS

1. FEVER IN PREGNANT WOMEN

Fever is always serious in pregnant women. Fever may provoke abortion or premature delivery (**see 19.1**).
Listen to the fetal heart beat and where there is fetal distress (FHB > 160 beats per minute) give the woman paracetamol, adequate fluid intake and appropriate treatment.

The most common causes are:
- Malaria: Check malaria smear.
- Urinary and pelvic infections: check urine, do obstetric and gynaecological examination.
- Respiratory infection: ask for symptoms, check RR, lungs.

If no cause can be found and the examination is normal: treat the fever with paracetamol and see the patient again after 1 day.

2. FEVER IN CHILDREN <1 Year

New-borns and Babies < 2 months (**see Danger signs, 4 and Appendix 24**)

Fever is always serious in new-borns and children <2 months

- Treat in IPD. Temperature should be checked rectally.
- In case of Malaria treat with appropriate anti-malarials.
- In case of infection (e.g. respiratory infections, meningitis), new-borns can develop neonatal sepsis (infection of the whole body) within a few hours. **Refer to IPD and follow Neonatal Guidelines** (**see appendix 24.11**).

Danger Signs in Infants

- Unable to breast feed
- Hypothermia (temp less than 36 °C)
- Convulsions
- Drowsiness or unconsciousness
- Respiratory rate less than 20/min or greater than 60/min
- Bulging fontanel
- Nasal flaring
- Grunting
- Severe chest indrawing
- Central cyanosis
- Offensive / smelly wet umbilical cord
- Skin pustules.

Children above 2 months (**see Danger signs, 4**)

If no danger signs, treat in OPD, but always consider:
- Malaria: check MS
- Otitis: check ear drums
- Respiratory infection: increased RR, chest indrawing, nose flaring, noisy breathing, cyanosis, cough
- Meningitis: vomiting, sleepy, convulsions, bulging fontanel, sometimes neck stiffness
- Urinary infection: Check urine and do microscopic examination (if possible)
- Diarrhoea and signs of dehydration
- Skin infections: Get the child undressed and look at whole body
- Joint or bone infections: Move the patient's arms and legs, touch the joints: look for swollen and warm joints.

FEVER IS THE MOST COMMON CAUSE OF CONVULSIONS IN CHILDREN UNDER 5 YEARS!

3. HYPOTHERMIA

DEFINITION

Temperature less than 35.5 °C.
Hypothermia can happen in:

- Sepsis (**7.4**)
- Neonates, especially preterm
- Severely malnourished children (**17.1**)
- Hypoglycaemia (**10.1**)
- Diabetes mellitus (**10.1**)
- Alcohol abuse (**23.1**)

TREATMENT

Treat the cause. Use kangaroo method (see appendix **25**). Keep patients warm with a hat (for neonates) and blankets.

7.5 PAIN

DEFINITION

Pain is an unpleasant subjective sensation that may be a sign of injury. Pain can also be a symptom of a disease. Pain is a reason for a patient to come to the clinic. Your patient complains of pain – but pain is not a diagnosis. Try to find the disease (history, clinical examination) and **always** treat the pain.

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

TAKE THE HISTORY OF THE PAIN (ASK THE PAIN QUESTIONS)

TIME:	When did the pain start?
ONSET:	How did it start? (Sudden or slowly increasing)
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?
SYMPTOMS:	What symptoms are associated with the pain? (fever, cough, frequent urine, diarrhoea, constipation, vomiting)
INTENSITY:	How severe is the pain? use a **pain scale** (0 = no pain and 10 = the most severe pain possible). For children you can use the pain scale pictures below.

0 No pain | **1 Mild** | **2 Moderate** | **3 Severe** | **4 Very severe** | **5 Overwhelming**

Examine the patient
Patients with severe pain might need painkillers before examination.
Check especially the area where the pain seems to be localised: **Look, Listen, Feel**.

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

Step 1	Step 2	Step 3	Step 4
Paracetamol, ASA **Amitriptyline** (for nerve pain)	**Ibuprofen** **Indomethacin**	**Codeine** **Tramadol**	**Pentazocine** **(IM,SC,IV)**

(For doses see Drug Tables at end of Guidelines, **24.9**).

- 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 (tramadol or codeine) 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.

Treatment examples

- Moderate headache, muscle, joint or bone pain: **paracetamol or aspirin (ASA).** If moderate muscle or joint pain does not improve with ASA, start anti-inflammatory drugs like **ibuprofen or indomethacin** if not contraindicated.

Do not give ASA in children below 12 years.

- **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.
- For moderate-severe pain you can use **codeine** or **codeine-paracetamol**. If codeine is not enough, you can start **tramadol**.
- For very severe pain give **pentazocine.** Always find a diagnosis for a patient with severe pain. Relieving pain with painkiller treatment is not enough.
- Since 2006 you cannot order pentazocine in Thailand. Discuss with the doctor what pain medication is available in your clinic.

Note:

- Pentazocine can depress the respiratory system. Take extreme care using this drug in patients with existing respiratory problem or hypovolemic patients (e.g. land mine injury).
- Never exceed the maximum recommended dose of painkillers.

Additional Therapy

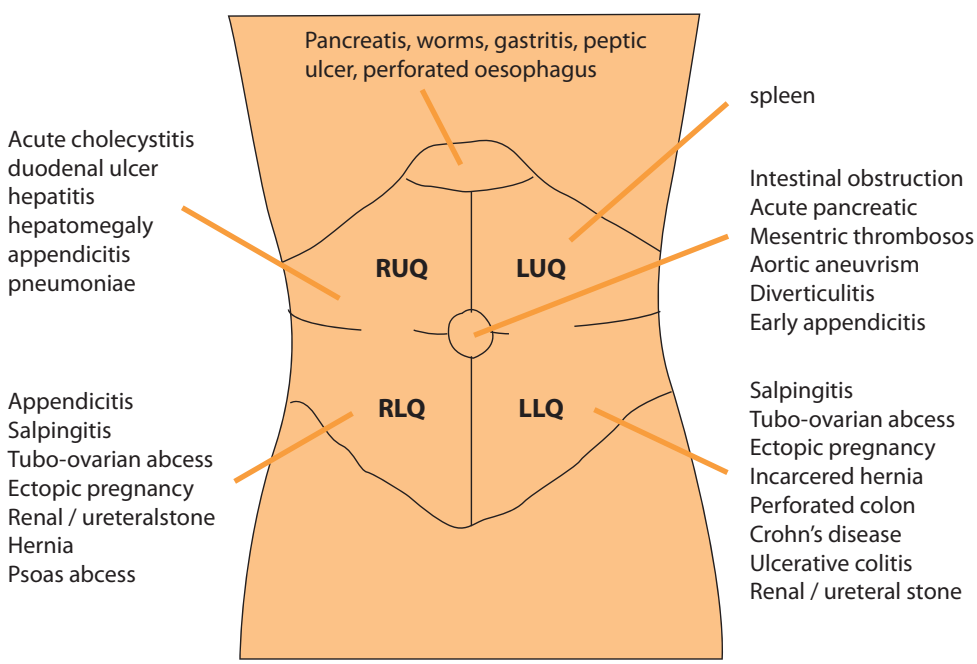
- Pain may be accompanied with other symptoms such as nausea or anxiety. Pain treatment includes management of the side effects of pain.
  Medication to treat nausea: **metoclopramide** and **chlorpheniramine.**
  Medication to treat anxiety: **diazepam.**
- Do not give ASA, Ibuprofen or Indomethacin for epigastric pain. These medicines worsen gastritis and peptic ulcer disease (**7.5**). If you do decide to treat a patient with epigastric pain with one of these painkillers, protect the stomach with H2 blockers (cimetidine, ranitidine-donation) or omeprazole.
- 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 palliative care chapter **(20.4)**.
- 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.

Acute abdominal pain

DEFINITION

The patient has one or more of the following symptoms or signs: abdominal pain, vomiting, fever, diarrhoea or constipation, abdominal tenderness and abdominal distension. Shock may follow acute abdominal pain. Good history taking and examination are essential to diagnose the correct disease. Some diseases require immediate surgery: organ rupture (e.g. ectopic pregnancy, aneurysm aorta, splenic rupture), 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

It usually represents surgical causes like peritonitis, appendicitis, cholecystitis, intestinal perforation/ obstruction, ectopic pregnancy rupture. Renal stones, incarcerated hernia and cholangitis might also need an operation.

TREATMENT

- Refer the patient to the hospital.
- Give nothing to eat or drink.
- If you cannot find a car and you have to wait one night, start IV fluids and antibiotics:
  1st choice: IV ampicillin + IV gentamicin + IV/PO metronidazole
  2nd choice: IV chloramphenicol + IV gentamicin.

2. Soft abdomen with moderate pain

It usually represents nonsurgical causes like pyelonephritis, worms, painful menstruation, PID, peptic ulcer (without perforation), gynaecological or obstetrical problems, hepatitis.

TREATMENT according to cause.

REFERENCES

Pyelonephritis (**see 13.1**), worms (**see 12.4**), painful menstruation, PID (**see 13.5**), endometritis, peptic ulcer (without perforation) (**see 7.5**), obstetrical problems (**see 19**), hepatitis (**see 12.3**).

Epigastric pain

Epigastric pain is a very common complaint in clinics on the Thailand/Burma border. Possible causes are:

1. GASTRO-OESOPHAGEAL REFLUX DISEASE

DEFINITION

Gastro-oesophageal reflux disease (GERD) is caused by (mucosal) cell damage produced by the abnormal reflux of gastric contents into the oesophagus. This is commonly due to changes in the barrier between the oesophagus and the stomach. High alcohol intake, obesity, heavy smoking and eating spicy food are risk factors.

SIGNS AND SYMPTOMS

- Chronic burning pain in the epigastric area or behind the sternum.
- Burning pain in the epigastric area moving to the mouth with acid taste.
- Difficulty swallowing.

DIAGNOSIS Clinical diagnosis.

TREATMENT

- Try to reduce or stop alcohol, smoking, spicy food, tea and coffee.
- Advise obese patients to lose weight.
- Give antacids: **Aluminium hydroxide** 500 mg TID between meals and at bedtime as required.
- If aluminium is not enough: **Omeprazole** 20 mg OD in the morning for 4 weeks or **Cimetidine** 400 mg BD or 800 mg OD at bedtime for 4 weeks.

PREVENTION

Tell your patient to avoid coffee, alcohol, eating spicy foods and smoking. Having more but smaller meals also reduces the risk of GERD, as it means there is less food in the stomach at any one time. Avoid eating for 2 hours before bedtime. Do not lie down after a meal.

2. GASTRITIS

DEFINITION

Gastritis is an inflammation of the stomach surface. It can be due to drinking too much alcohol, heavy smoking and eating spicy food. Prolonged use of some medicines (like ASA, indomethacin, ibuprofen, high dose ferrous sulphate) can cause or worsen the disease. Infection with bacteria such as Helicobacter pylori (H. pylori) also causes gastritis.

SIGNS AND SYMPTOMS

- Burning pain in the epigastric area.
- Nausea, vomiting, bulging, feeling of fullness.
- Burning pain in the epigastric area moving to the mouth with acid taste.

DIAGNOSIS Clinical diagnosis. If vomiting with blood: see peptic ulcer disease.

TREATMENT

- Try to reduce or stop alcohol, smoking, spicy food, tea and coffee.
- Stop anti-inflammatory drugs (ASA, indomethacin and ibuprofen).
- Give antacids: aluminium hydroxide 500 mg TID between meals and at bedtime as required.

Gastritis is rare in children

PREVENTION

Avoid coffee, alcohol, eating spicy foods, smoking. Stop ASA, indomethacin and ibuprofen.

3. PEPTIC ULCER DISEASE

DEFINITION

In peptic ulcer, epigastric pain can be very severe. If a patient with long-lasting epigastric pain does not get better on aluminium hydroxide and has had mebendazole, you should start treatment for peptic ulcer. Mostly peptic ulcers result from infection with bacteria called Helicobacter Pylori. This bacterium is resistant to acid and able to survive the highly acidic environment in the stomach. 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, often worse between 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

In some cases acute **bleeding** can happen. The patient will vomit brown liquid (like coffee) or fresh blood and will have melaena (black sticky smelly stools). (Remember that patients on iron tablets will have black stools).

DIAGNOSIS

Clinical diagnosis. Ideally all patients who suffer from peptic ulcer disease should be tested for helicobacter pylori. However, testing is expensive and difficult. Treat all patients with gastric bleeding, or those with prolonged epigastric pain that does not get better, on aluminium hydroxide and mebendazole.

TREATMENT

Triple therapy to kill H. Pylori: **Omeprazole** 20 mg BID for 1 week.
Metronidazole 400 mg TID for one week.
Amoxicillin 500 mg TID for one week.
Follow triple therapy with cimetidine 400mg PO BID for 4-6 weeks.

In case of active bleeding

- Start IV line with RL or NSS.
- Monitor vital signs. Take Hb/Hct and blood group.
- If the patient is in shock, transfuse if possible.
- Put a nasogastric tube.
- Start cimetidine.
- Keep the patient 'nil by mouth'.
- Refer the patient.

Active bleeding from a peptic ulcer is an emergency: manage the patient as quickly as possible

PREVENTION

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. See prevention of gastritis.

4. WORMS

Worms often give epigastric and abdominal pain in children and adults. (**see worms 12.4**)

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

5. ANXIETY

An anxious person can complain of epigastric pain. Try to take a good history and look especially at the social history (**see 18.5**).

6. CARCICOMA OF THE STOMACH

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.
Curative treatment will be not available in most clinics but provide palliative care (**20.4)**.

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.

The causes of headache are numerous and include:

- tension (stress)
- depression
- migraine
- post traumatic
- temporal arteritis
- cervical arthritis
- neurological: tumours, stroke, subarachnoid haemorrhage
- infections:
  - localised: e.g. meningitis, sinusitis
  - systemic:
  - bacterial e.g. TB, leptospirosis, typhoid
  - viral e.g. dengue fever
  - parasitic e.g. malaria
- drugs: alcohol, nifedipine, caffeine withdrawal.

The most important part of the evaluation of headache is the **HISTORY.** ASK QUESTIONS.
You should ask for the intensity, quality and the site of 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? Ask for factors that make the headache worse. Look for these important clues:

- Acute severe headache.
- New onset.
- Progressive (increasing in intensity and severity).
- Caused by, or worsens with exercise.
- Associated neurological signs and symptoms (e.g. mental disturbance, loss of memory, epilepsy, abnormal reflex, loss of sensation, loss of muscle power).
- Associated systemic signs and symptoms.

Treat the underlying disease (e.g. infections) and relieve headache with paracetamol. For specific causes of headache see below.

SPECIFIC CAUSES OF HEADACHE

1. Tension headache

The headache is usually bilateral (both sides of the head are involved), may be most intense about the neck or back of the head and not associated with any neurological signs or symptoms. The headaches are generally daily and described as tight or band like. The pain is not increasing during exercise.

TREATMENT

Explain 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, massage and/or hot baths. Use analgesics such as paracetamol.

2. Migraine

The typical migraine attack is a one-sided beating or dull headache that can be worsened by activity. Migraine is commonly associated with nausea, vomiting, photophobia (not liking light), blurred vision and the sensation of a blocked nose on the side of the pain. The pain builds up gradually over hours and may last for several days. Visual disturbances occur quite commonly and consist of light flashes, zigzags, and/or vision field defects. There may be other neurological findings such as aphasia (cannot speak), numbness, tingling or weakness.
Some people experience symptoms (e.g. mood alternation, tiredness, yawning, stiff muscles) a few hours or days before the migraine attack take place. There is usually a family history and attacks may be triggered by stress, foods, alcohol, menstruation and contraceptives.

TREATMENT

Staying in a quiet dark room is often helpful. Medication such as aspirin or other similar drugs such as ibuprofen, naprosyne or diclofenac often helps If the attacks are frequent, refer to doctor for chronic medication: prophylaxis with amitriptyline, propanolol or aspirin may be useful. Taking the medicine with a caffeine drink such as coca-cola can also help.

3. Depression

Headache is very common in depressed people and associated with other signs of this illness, (**see 18.1**).

TREATMENT See treatment advice in depression chapter (**see 18.1**).

4. Post Traumatic

A variety of non-specific symptoms including headache may often occur after a head injury, regardless of the severity of the injury. The headache usually starts within a day or so after the injury and worsens over the next few weeks and then gradually gets better. It is usually a dull constant ache with pulsating pain that may be localised. It is sometimes accompanied by nausea, vomiting and visual disturbances. Impaired memory, difficulty concentrating and emotional liability are often present.

TREATMENT Exercise of neck muscles, simple analgesics and occasionally amitriptyline.

5. Stroke

This may be accompanied by a headache. A stroke has specific signs and symptoms (**see 8.3**).

TREATMENT see **8.3 Stroke**.

6. Subarachnoid haemorrhage

Sudden onset of an extremely severe global headache with impairment of consciousness and occasionally neurological signs (**see 8.3**).

TREATMENT Immediate referral to hospital if the headache started less then 4 hours ago. **See 8.3 Stroke**.

7. Tumours

Brain tumours may cause headaches that vary from mild to severe and can cause neurological signs. They may be worsened by exertion and position, and associated with nausea and vomiting.
Generally they are described as different from any previous headache. They may be of new onset and progressive.

TREATMENT

Antitumoural treatment is mostly not available on the Thailand/Burma border. Discuss with doctor for providing symptomatic treatment of the headache.

8. Meningitis/encephalitis

Severe headache developing over a few hours associated with impairment of consciousness and with fever. Usually there are no neurological signs (**see 15.1**). TB meningitis may be much less acute and is seen in the camps.

TREATMENT

Immediate treatment (or referral if you are not treating meningitis patients in your hospital). If you refer a patient with meningitis, consider giving an injection of ceftriaxone (>2mths age) or ampicillin and gentamicin (<2 months) at the time of diagnosis before transporting. Viral encephalitis will not respond to IV antibiotics. If possible do a LP before treatment. Do not delay treatment if waiting for someone to make an LP.

9. Temporal arteritis

Elderly patients (50 or older) with one-sided headache (although both sided can also occur) associated with malaise, fever, muscle pain, anorexia and weight loss. Palpation of the head reveals sensitive and thick (temporal) arteries with or without pulsation. The sedimentation rate will be significantly elevated, usually over 50. Blindness is the most feared complication.

TREATMENT Consultation with a physician followed by administration of steroids.

10. Other: dental, ocular, sinusitis, cervical arthritis or cough Headache

Dental problems (**see 9**), sinusitis (**21.1**) or eye problems (**see 11**) can cause headaches. Muscle or bone problems in the neck often result in headache. Also sudden increase of abdominal muscle tension (by defecation, cough, sneezing or laughing) can cause headache. This pain lasts only a few minutes and disappears. The cause for cough headache is not known; it may persist for several years.

TREATMENT Find and treat the cause. Ibuprofen, diclofenac or naprosyne are helpful.

REFERENCES

Dengue (**15.3**), Dental problems (**9**), Depression (**18.1**), Eye problems (**11**), Leptospirosis (**15.1**), Malaria (**15.2**), Meningitis (**15.1**), Stroke (**8.3**), Sinusitis (**21.1**), TB (**21.5**), Typhoid (**15.1**).

7.6 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
DO NOT WAIT FOR LOW BP BEFORE TREATING SHOCK

7 COMMON SYMPTOMS

EMERGENCY MANAGEMENT

General treatment – in ALL patients

A = AIRWAY
B = BREATHING
C = CIRCULATION

- Keep the airway clear (mouth, throat, trachea, coma position)
- Give high flow oxygen
- Put in 2 IV cannulas (biggest size possible 16G or 18G)
- Start normal saline; monitor fluid balance (fluid IN/OUT).

Other treatment depends on the cause. See below.

CLINICAL FEATURES

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):
Most common causes:

- Bacterial infection (septic shock)
- Severe allergic reaction (anaphylactic shock)
- Severe brain injury or bleeding (neurogenic shock)
- Taking of certain drugs or poisons.

3. Cardiogenic shock (Shock caused by weak pumping of heart = heart failure):
Most common causes:

- Chronic Severe Anaemia (**see 14.1**)
- Vitamin B1 Deficiency (**see 17.2**)
- Damaged heart valve
- Abnormal rhythm of the heart: too fast (tachycardia) or too slow (bradycardia)
- Lung collapse (pneumothorax)
- Heart attack.

SIGNS AND SYMPTOMS

Signs and symptoms can vary with the different kind of shock, but some are common in most patients:

- Fast and weak pulse (>110 bpm in adults).
- Fast, shallow breathing (> 30 respirations per minute in adults).
- Cold, sweaty ('clammy') skin occurs in most shock patients. An exception is the flushed skin in the early stages of vasodilatory shock (for example, in septic shock).
- Hypotension (low blood pressure) – Systolic BP < 90 mmHg occurs in most shock patients. Low 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 30cc/hour.
- 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

General treatment – in ALL patients in SHOCK

A = AIRWAY – Keep the airway clear (mouth, throat, trachea)
B = BREATHING – Give high flow oxygen
C = CIRCULATION – Put in 2 IV cannulae (biggest size possible 16G or 18G)
– start normal saline; monitor fluid balance (fluid IN/OUT).

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

1. HYPOVOLEMIC SHOCK: BLOOD/FLUID LOSS

- Stop the bleeding.
- Give normal saline (or Ringer's lactate) at 1L in 15-20 minutes or 20 cc/kg STAT. Give at least 2L in the first hour.
- If there is still bleeding, fluid replacement must include ongoing losses: this could mean giving 2L of fluids per 1 hour.
- Shock from blood loss requires blood transfusion, several units may be necessary.

AIM TO REPLACE 2-3 TIME THE ESTIMATED LOSS
e.g if loss is 1000 cc then the patient will need 2000-3000 cc – rapidly

2. SEPTIC SHOCK

- Give **IV fluids** as for blood/fluid loss.
- Give high doses: **ampicillin and gentamicin OR ceftriaxone**, preferably IV.
- Try to find the source of the infection.

3. ANAPHYLACTIC SHOCK

- Drug or blood infusions should be stopped immediately.
- IV fluids as for blood/fluid loss.
- Give **adrenaline, chlorpheniramine, and hydrocortisone (see next page for doses).**

4. CARDIOGENIC SHOCK

- Treat the cause (e.g. anaemia, beri beri).
- For heart failure treatment **see 8.2**.

General remarks

Careful monitoring in all patients of:

- Vital signs (pulse rate, blood pressure, respiratory rate) every 15 minutes.
- Urine output (put in a urinary catheter) – minimum output should be at least:
  – 30 cc/hr in adults or
  – 2cc/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 (refer to beginning of chapter).

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 (pulse <100 bpm, systolic BP ≥90 mmHg, urine output >30 mL /hour and mental condition improved) adjust the rate of infusion to: 1L in 6hrs.

PREVENTION

Once someone is in shock, the sooner shock is treated the less damage there may be to the person's vital organs such as the kidney, liver and brain. Early first aid and emergency medical help can save his or her life.
People who have a history of a severe allergy reaction to insect bites or medicines should be instructed to carry (and use) an emergency kit consisting of injectable epinephrine and chewable antihistamine (if available). They should also wear a bracelet or necklace stating their allergy.

REFERENCES Anaemia (**14.1**), Vitamin B1 Deficiency (**17.2**)

Treatment doses in SHOCK therapy

Adrenaline (IM) 1 vial = 1cc= 1 mg
Adrenaline 1:1,000 contains 1 mg of adrenaline per mL of solution in a 1mL glass vial.

Doses for Anaphylactic **shock, Severe Allergic Reactions:**

CHILD < 6 months	IM	0.05 mg	0.05 cc	• **Dose:** 0.01mg/kg (maximum dose 0.5mg) • **IM** is the recommended route of injection • **Repeat dose** at 5 minutes intervals until BP and pulse are back to normal • **For babies:** dilute the dose with NSS to give usable volumes.
6 months – 6 years	IM	0.12 mg	0.12 cc	
6 –12 years	IM	0.25 mg	0.25 cc	
> 12 years	IM	0.5 mg	0.5 cc	
ADULT	IM	0.5 mg	0.5 cc	

In case of **cardiac arrest** or **when the patient is severely ill** adrenaline may be given by **slow IV injection.**

– IV Adrenaline (1:1000)	– Cardiac arrest
– Adult	– 1mg
– Child	– 0.01ml/kg (=10 mcg/kg)

Chlorpheniramine (IV) - 1 vial = 1cc = 10 mg

Chlorpheniramine Maleate (IV/IM) – vial 10 mg/ml

CHILD < 1 year	IV/IM	2 mg	0.2 cc	• **Dose:** Child: 200 micrograms/kg STAT Adult: 10-20 mg over 1 minute STAT. (maximum dose 40 mg) • **IV/IM is** the recommended route of injection
1–5 years	IV/IM	3 mg	0.3 cc	
6–12 years	IV/IM	8 mg	0.8 cc	
ADULT	IV/IM	20 mg	2 cc	

OR

Chlorpheniramine Maleate (oral) – tablet 4 mg

CHILD under 1 year	oral	Not recommended	
1–2 years	oral	¼ tablet BD	1 mg BD
3–5 years	oral	¼ tablet QID	1 mg QID, max. 6 mg daily
6–12 years	oral	½ tablet QID	2 mg QID, max. 12 mg daily
ADULT	oral	1 tablet QID	4 mg QID, max. 24 mg daily

Hydrocortisone (IV/IM)

Hydrocortisone sodium succinate (IM/ slow IV) – 1 vial = 100 mg

CHILD < 1 year	IV/ IM	25 mg /6H	• **Dose:** Child: 2 mg/kg every 4-6 hours Adult: 200 mg every 4-6 hours • **IM or slow IV is** the recommended route of injection
1year – 5 year	IV/IM	50 mg /6H	
6 year – 12 year	IV/IM	100 mg /6H	
ADULT	IV/IM	200 mg /6H	

OR

Dexamethasone (IV/IM) – 1 vial = 1cc = 4 mg

Dexamethasone Phosphate (IV/IM) – 1 vial = 1cc = 4 mg

CHILD < 8 kg	IV/IM	1 mg	0.25 cc	• **Dose:** Child: 0.25 mg/kg STAT Adult: 12 mg STAT • **IV/IM is** the recommended route of injection
8 kg – 15 kg	IV/IM	3 mg	0.75 cc	
15 kg – 30 kg	IV/IM	5 mg	1,25 cc	
> 30 kg	IV/IM	8 mg	2 cc	
ADULT	IV/IM	12 mg	3 cc	

8 CARDIOVASCULAR DISEASES

8.1 HYPERTENSION

DEFINITION

Hypertension, or high blood pressure (HBP), is an increase of systolic and/or diastolic Blood Pressure (BP) more than the normal level for the population. In general hypertension is defined as a systolic blood pressure (SBP) equal to or greater than 140 mm Hg and/or a diastolic blood pressure (DBP) equal to or greater than 90 mm Hg. Hypertension is a risk factor for stroke (**see 8.3**), heart failure (**see 8.2**), and renal failure.

SIGNS AND SYMPTOMS

Hypertension could cause headache, dizziness or fatigue, but if there are no complications, most patients have no symptoms. The diagnosis is usually made during a routine examination. 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). Traditionally, it should be the right side.

Measure the BP to the nearest 2mmHg. Do not approximate measurements so that all readings end 0 or 5.

BP varies with age, time of the day and physical activity. Anxiety, pain and an unfamiliar environment can also cause a temporary rise in BP. Never diagnose HBP if you have measured BP only once and the patient has no symptoms.

DIAGNOSIS

Hypertension is defined as a systolic pressure equal to or greater than 140 mm Hg and/or a diastolic pressure equal to or greater than 90 mm Hg measured at least 3 times in 3 months.

Unless there is severe hypertension, (systolic BP > 180 or diastolic BP > 120) and/or complications, you will declare the patient as HBP **only** after you have found abnormal BP values at least 3 times within 3 months

Diagnosis and management of HBP is important because it is a risk factor for heart disease, stroke and kidney failure. The cardiovascular risks of HBP in an individual patient are greater if there are **other risk factors** such as age (>60 year), gender (males>females), poor diet, smoking, high blood cholesterol, diabetes mellitus (**see 10.1**) and if the patient already has heart disease or kidney disease.

CAUSE

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:

- Alcohol consumption and smoking.
- Pregnancy (pre-eclampsia)*.
- Kidney diseases.
- Diseases of the adrenal gland or other glands.
- Obesity.
- Medicines and drugs: prednisolone,
- contraceptive pill, amphetamines (YaBa), non-steroidal anti-inflammatory drugs, salbutamol.
- Pain and anxiety.
- Congenital heart disease.

*Remark: pre-eclampsia is a very severe condition in pregnant women with HBP near the end of pregnancy. This condition is very different from essential hypertension and treatment is also different. (**See 19.5**)

COMPLICATIONS OF HBP

- Blood vessels: pain in the legs when walking, ischemic heart disease **(IHD)**.
- Central Nervous System: **Stroke** is a common complication of HBP and may be due to cerebral haemorrhage or cerebral infarction. **Transient ischemic attacks** and **subarachnoid haemorrhage** are more common in hypertensive patients. **Hypertensive encephalopathy** is a rare condition of very high blood pressure and neurological symptoms including temporary loss of speech or vision, numbness, confusion, convulsions and loss of consciousness. All of these can be reversed if the BP is properly controlled.
- Eyes: There is 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 **coronary artery disease**. HBP puts a lot of pressure on the heart and may lead to **left ventricular hypertrophy**. Severe hypertension can cause **left heart failure**. **Atrial fibrillation** is common. (**see 8.2**)
- Kidneys: Kidney disease can cause HBP but **chronic kidney failure** can also be the result of long standing hypertension.
- Malignant hypertension: This is a condition of very high blood pressure with rapidly progressive complications as described above.

EVALUATION OF HBP

First you must take a careful history. Do a complete physical examination and do some simple investigations:

1. Obtain accurate BP measurements and be sure of the diagnosis and the severity of HBP.
2. Identify other risk factors for cardiovascular disease (see above) and any complications.
3. Determine whether there is an underlying cause. Secondary hypertension is more likely in:

- Patients with symptoms of other diseases.
- Patients with abnormal blood or urine test.
- Young patients (< 30 years old).
- Malignant hypertension.
- Hypertension not responding to treatment.
- History of repeated urinary tract disease.

Investigations help to decide what is the cardiovascular risk, diagnose secondary HBP and identify complications.

- All patients should have a **urine dipstick** for blood, protein and glucose. If positive, discuss with the doctor.
- If you suspect complications or secondary HBP, take a blood sample for plasma creatinine, BUN, and electrolytes, and plasma cholesterol.
- If you suspect secondary HBP patients may need hospital investigations to find and treat the cause.

For the treatment you can use guidelines (Table 1) to help you to decide what is the most suitable treatment category for the patient. Some important facts to remember are:

- It is not possible to define an ideal BP which is the same for everybody. In patients with diabetes mellitus or heart failure or kidney disease the aim should be BP<125/85.
- Find all possible cardiovascular (CVS) risk factors to help decide if it is necessary or helpful to treat HBP.
- The benefits of anti-hypertensive drugs must be greater than the danger from side effects.
- Different people will have different response to the drugs even if the initial BP is the same.
- Patients with HBP must have regular BP follow-up. Management of the patient's condition may need to be altered if the patient's condition has improved or deteriorated.
- All patients with hypertension should be advised to lose weight, do regular exercise, reduce salt intake, and reduce or stop other risk factors.

THERAPY

TABLE 1

All patients should be advised to change life style (see life style treatment)

SBP	DBP	Other CVS risk or complications	Treatment
141-159	91-99	No	1. Life-style treatment 2. Review at least every 3 months 3. If BP is stable and no complications, no need for medication.
160-179	100-109	No diabetes, No kidney disease, No heart failure	1. Check BP every 2 weeks for 12 weeks 2. Start medication if you find increased BP more than 3 times (Table 2).
141-179	91-109	Diabetes or Kidney disease or Heart failure	1. Check BP every week for 12 weeks 2. Start medication if you find increased BP at least 3 times (see table 2).
180-200	110-120	All	1. Admit for observation and check BP QID for at least 48h 2. Observe pattern of BP increase (all the time/ morning only/ irregular/ both arms/ lying-standing) 3. Record any signs and symptoms occurring when BP is high 4. Consider possibility of secondary HBP 5. Start treatment if HBP is continued (Table 2).

>200	>120	All BP should go down in days and not in hours because lowering BP too quickly can cause -Blindness -Acute kidney failure -Stroke -Cardiac arrest	1. Admit to IPD for absolute bed rest. 2. Give **furosemide** 20-80 mg PO stat and repeat PRN 3. Monitor vital signs and urine output every hour 4. Give **hydrochlorothiazide, propranolol** and/or **enalapril** PO In the first 24 hours the DBP should be down to about 120mmHg Over the next 2 days the DBP should be < 110mmHg Over the next 2–4 days the diastolic BP should be <100mmHg 5. Discharge the patient on medication when BP is less than or equal to 160/100 for 2 days; monitor BP daily for one week 6. Continue frequent follow up for 2 to 3 months.
>200	>120	Symptoms of CNS and heart disorder (malignant HBP) -Nausea and vomiting -Headache, confusion -Restlessness -Convulsion, coma -Vision problems -Pulmonary oedema Acute kidney failure	1. Admit to IPD and consult doctor 2. Closely monitor vital signs, GCS and urine output 3. Try to reduce DBP to about 110mmHg with IV drugs **Furosemide** 40-80 mg IV **Hydralazine**: 5 mg IV STAT, then every 20-30 minutes until DBP around 110 mmHg. Maximum dose 20 mg. 4. Stop IV treatment when diastolic 110mmHg, start oral drugs 5. As soon as the patient can eat, start oral treatment. 6. Discharge the patient on medication when BP is less than or equal to 160/100 for 2 days; monitor BP daily for one week. 7. Continue frequent follow-up for 2 to 3 months.

TABLE 2

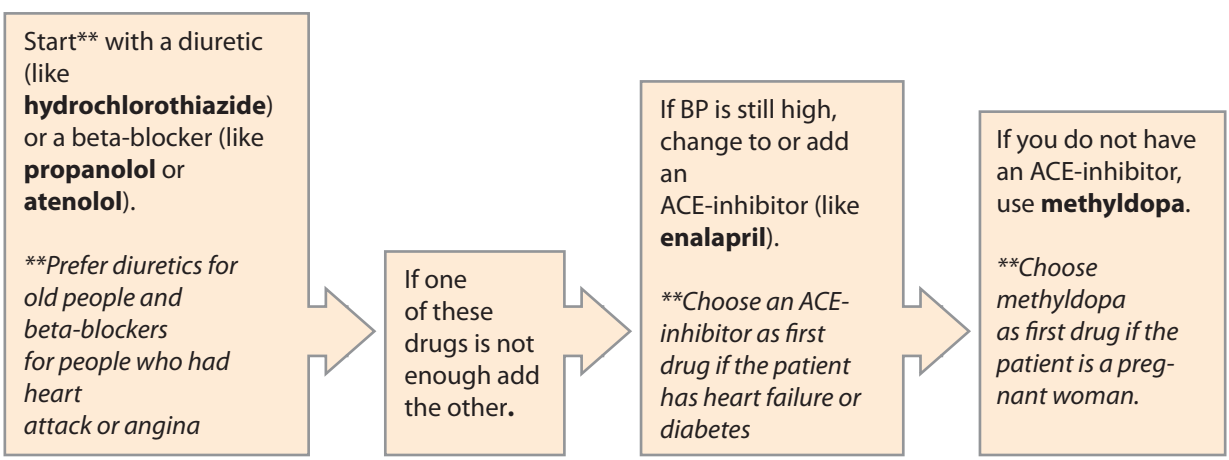


TABLE 3 Anti-hypertensive drugs, doses, contra-indications and side effects

Diuretics * Hydrochlorothiazide 12.5 mg OD (max 50 mg OD). Contra indication: gout, pregnancy, severe renal or liver failure. Side effects: hypokalemia, high glucose, postural hypotension. * Furosemide 40 mg OD, no max dose. Contra indication: severe liver failure. Side effects: hypokalemia (potassium supplementation recommended). **Beta-blockers** *Propranolol 40 mg BD, increase by 40 mg BD every 3-4 weeks until pulse is under 60 /min (max 160 mg BD) Contra indication: asthma, COPD, HR < 50/min. Side effects: slow pulse, cold extremities, bad dreams, impotency. *Atenolol 25 -50 mg OD. Contra indication: asthma, COPD, HR < 50/min. Side effects: slow pulse, cold hands and feet, bad dreams, impotency.	**Angiotensin Converting Enzyme Inhibitor (ACE-I)** Enalapril 5 mg OD, increase by 2.5 mg OD every 3-4 weeks (max 40 mg OD). Contra indication: pregnancy. Side effects: very low BP, renal failure, dry cough. **Central working Anti Hypertensive** Methyldopa (250 mg BID-TID, max 3g / day) (old people: 125 mg BD, max 2 g / day). Contra indication: depression, active liver disease. Side effects: nausea, stomatitis, dry mouth, oedema. **Vasodilator** * Hydralazine oral 25mg BD (max 50 mg BD). Contra indication: severe tachycardia, renal disease. Side effects: tachycardia (fast pulse), nausea and vomiting. * Hydralazine IV for HBP crisis. 5mg IV slowly every 20-30 minutes until DBP<110 (max 20 mg). Contra indication: do not use in patients with stroke. Side effects: as above but also causes rapid and profound drop in BP.

MANAGEMENT OF HBP

5% of the cases are secondary HBP and it may be possible to cure some of these cases.
95% of the cases are essential HBP. These patients must be told that it is not possible to cure the HBP but it can be controlled. If BP is controlled to normal levels the risk of complications is reduced and survival is improved. Explain that the patient may be on treatment for life. There are two parts to BP management: 'Life-style treatment' and Medication.

1. 'LIFE-STYLE' TREATMENT

If possible, encourage patient to change any unhealthy behaviour. Regular exercise and healthy habits should be promoted for all patients with HBP at every consultation. Lifestyle treatment alone can be very effective in decreasing BP and may make it normal. But as this new life style will have to be maintained for many years, it is very difficult for the patient and he will need lots of encouragement. If the patient's BP returns to normal after 'life style' treatment alone, continue to monitor his condition and BP every 3 months.

Life style treatment should be promoted for all patients at every consultation

- **Anxiety**: If the patient complains of anxiety, sleeping disorder, sadness or irritability, help to control.
- **Certain medicines and drugs**: If patient is taking drugs which can cause hypertension, discuss with the patient and the doctor if it is safe to stop them or change them.
- **Alcohol**: encourage and support the patient to reduce or stop.
- **Overweight:** if patient is obese or overweight, encourage weight loss/ dieting.
- **Exercise:** encourage the patient to take daily exercise. Regular walking can be recommended to any patient.
- **Salt:** Reducing sodium in diet will lower the BP. Many substances used to improve the flavour of food have a high level of sodium. Seek advice from the doctor or nutritionist.

2. TREATMENT WITH MEDICATION

Table 2 gives guidelines on how to choose which drug to use. Tables 1 and 3 list the medication that can be used to treat hypertension. When starting a patient on medication:

- They must understand that HBP cannot be cured and that medication (as well as life style treatment) should be taken all the time for life. They should have regular follow up and check BP for life.
- For non-emergency situations, start with one medication only, give minimum dose and remember that most medication takes 4-8 weeks to show maximum effect. Increase the level of treatment after 2-3 months if BP does not come down.
- Monitor regularly for side effects. Tell the patient to return to the clinic if there are side effects and not simply stop taking the medication.
- If no side effects of the drug, go up to maximum dose before changing medication or adding one more.
- It can be dangerous to stop medication suddenly so patient must first discuss with the clinic if they want to stop taking medication, even if they have side effects.

PREVENTION See life style treatment.

REFERENCES Heart failure (**8.2**), Stroke (**8.3**), Bad eyesight (**11.1**)

8.2 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. The two sides of the heart (left ventricle and right ventricle) could both be affected (left sided and right sided heart failure). Both have different symptoms.

8 CARDIOVASCULAR DISEASES

SIGNS AND SYMPTOMS

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 (orthopnea).
- Dry cough mainly at night.
- 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.

DIAGNOSIS

Common causes of heart failure:

- Hypertension **Check BP**
- Anaemia **Check Hct/Hb**
- Beriberi (Vitamin B1 deficiency)
- Hyperthyroidism **Check lab TSH**
- Alcohol, drug addiction
- Myocardial infarction (heart attack) **Check ECG**
- Arrhythmia (irregular heart beating) **Check ECG**
- Congenital heart disease
- Valvular disease (heart valves too tight or loose)

MANAGEMENT OF ACUTE HEART FAILURE

Patients can present with acute pulmonary oedema. In this case, they are suddenly short of breath, anxious and refuse to lie flat on their back.

Emergency treatment

- Sit the patient up.
- Give **oxygen** by mask if available, starting with high concentration mask and a minimum of 6 litres per minute.
- Put drip (so you can have vein access if the condition is getting worse). Use as few liquids as possible.
- **Give** diuretics: **furosemide** *40-80* mg IV in adults, children 1mg/kg.
- Repeat the **same** dose 30 minutes later if the patient has not passed urine and did not improve.
- Consider giving **vitamin B1** 100 mg IM injection.
- Record and follow the patient's vital signs every 15 minutes until stable. Then check hourly.
- Record the urine output closely. Put in a urinary catheter if necessary.

Give **digoxine** if tachy-arrhythmia (irregular pulse >120 per minute). If available, first do an ECG.

Once the patient is getting better, look for the cause of the acute episode and treat it

Second phase treatment

- Bed rest.
- Fluid restriction (max of 1.5 litre/day).
- Encourage patient to quit smoking.
- Weigh every day during hospitalisation.
- Continue **furosemide** 20-40 mg PO daily. Increase by 20 mg every 2 days to maintain the patient weight stable (maximum 80mg/day unless the patient has chronic renal failure.
- If furosemide is used long-term **potassium supplementation** will be required (furosemide makes you lose potassium in the urine):
  - Encourage the patient to eat bananas or give potassium chloride 1mg tablet BID.
  - If you add spironolactone (25mg OD) to furosemide, you do not need to give potassium supplements.
- If available, start treatment with **enalapril.**

If the patient is stable, he should continue on the same treatment.
Do not try to reduce the medication.

FOLLOW-UP: MANAGEMENT OF CHRONIC HEART FAILURE

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 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 he will need life-long treatment and care.

Make a detailed clinical exam

- Check heart sounds: new murmur or gallop, and changes in pre-existing sounds. Check BP, pulse, 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)

Promote life style treatment and repeat the following advice

- Reduce salt intake, stop or reduce smoking, alcohol intake and drug use.
- Advise regular exercise and physical activity. Encourage dieting if overweight.

Chronic Treatment (See Notes)

1. Reduce diuretic (like **furosemide**) to minimum doses to control fluid
2. Add ACE-inhibitor (like **enalapril**)

→ Increase dose of ACE inhibitor and/or add cardio selective beta blocker (like atenolol or metoprolol)

→ If still symptomatic:

Grade 2 or 3:
Add **digoxin**
If no contra indication

Grade 3 or 4:
Add **spironolactone**
If no contra indication

Notes

Furosemide
Usually the most common drug used in chronic heart failure as a continuation of an acute episode treatment. For chronic treatment reduce to the lowest dose, if fluid overload resolved stop furosemide.
Dose: 1 mg per kilogram OD but can be reduce to 0.5 mg / kg after a while
Side effects: Hypokalemia (give potassium tablet in case of chronic treatment)

Enalapril
This is the major drug to use in chronic heart failure as it is known to protect the myocardium from further degradation.
Dose*:* Start with 2.5 mg OD during one week
Then double the dose every week until you reach the maximum effect, usually 20 mg OD
Maximum dose: 40 mg per day
Contra-indication: Low BP (Systolic BP<90mmHg), renal failure, pregnancy.
Association with Furosemide: Must be monitored carefully as blood pressure can drop suddenly: start these drugs at the minimum dose with the patient in IPD. Give the first dose in the evening with the patient lying down.
Side effects: hypotension, hyperkalemia, angioedema, dry cough.

Selective ß-blockers
Selective ß-blockers slow disease progression, decrease hospitalisation and mortality and improve quality of life but have little or no effect on objective measures of exercise duration. Treatment should be started at a **very low dose**.
* **Atenolol:**
Dose: 25 -50 mg OD, slowly increasing over months.
Contra-indication: HR < 50/min
Side effects: slow pulse, heart block, hypotension, cold extremities, bad dreams, impotency, worsening diabetes, masks sign of diabetes. (Doses more than 100 mg/day are not cardio selective and can worsen asthma or diabetes. Be **CAREFUL** when increasing the dose).

*** Metoprolol**
Dose: start with 25 mg BID. Slowly increase dose every 4 weeks by 25 mg.
Maximum dose: 100 mg regardless of body weight
Contra-indication: HR < 50/min
Side effects: slow pulse, heart block, hypotension, cold extremities, bad dreams, impotency, worsening diabetes, masks sign of diabetes. Doses more than 100 mg/day are not cardio selective and can worsen asthma or diabetes. Be **CAREFUL** when increasing the dose).

Spironolactone
Spironolactone decreases mortality and hospitalisation and improves symptoms.
Dose: 25mg each day (monitor kidney function and serum K); >25 mg is rarely indicated
Contra-indication: Renal failure
Side effects: gynecomastia, menstrual irregularities, drowsiness and rashes, hyperkalemia (when used together with enalapril more risk of hyperkalemia)

Digoxin
Digoxin should **only** be used in patients with atrial fibrillation or when still symptomatic on the other recommended medication. Digoxin may improve symptoms, exercise tolerance and quality of life.
Dose: Adult: 0.25mg PO TID the first day, then 0.25 mg OD 5 days per week.
In old people start with half a tablet/ day (0.125 mg OD)
Contra-indication: Bradycardia (HR<50/min) or renal failure
Side effects: digoxin toxicity (nausea, vomiting, confusion, severe bradycardia and visual disturbances). In that event, decrease or stop the treatment. The risk of toxicity is increased with electrolyte disturbances and hypothyroidism.

Vitamin B1

In all acute cases where Beriberi can not be excluded, a treatment dose of vitamin B1 (100 mg 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 17.2**).

Aspirin

As heart failure patient are at high risk of ischemic accidents, they will benefit from a small dose of aspirin to prevent thrombosis and stroke, or infarct.
Dose: 75 to 100 mg per day

When to change the treatment?

- If the weight is increasing and oedema are 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 <90 mmHg): 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 you find signs of hyperkalemia (nausea, irregular heartbeat (this may be an emergency symptom if prolonged or severe), slow or weak pulse): REDUCE or STOP enalapril and/or spironolactone. In case of emergency discuss immediately with doctor.
- If the patient is improving or stable: **do not reduce the dose** of medication.

PREVENTION

Encourage patients to change their lifestyle. Give aspirin tablets if there was an ischemic heart attack. Give all patients diet advice and/or vitamin B1 supplementation.

REFERENCES

Hypertension (**8.1**), Anaemia (**14.1**), Beriberi (Vitamin B1 deficiency) (**17.2**), Hyperthyroidism (**10.2**), Alcohol& drug addiction. (**23.1**)

8.3 STROKE

DEFINITION

A stroke, also called a cerebral vascular accident (CVA), is the sudden death of cells in a specific area of the brain due to inadequate blood flow. A stroke occurs when blood flow to the brain is interrupted due to haemorrhage (an artery bursts: **Brain Haemorrhage**) or obstruction (an artery becomes closed by a blood clot: **Ischemic Stroke**). 80 % are caused by ischemia and 20 % by haemorrhage. The brain tissue beyond that artery is damaged or dies. (Brain cells need blood to supply oxygen and nutrients and to remove waste products.) Depending on the region of the brain affected, a stroke can cause paralysis, loss of vision, speech impairment, memory loss and reduced reasoning ability, coma, or death. The effects of a stroke are determined by how much damage occurs, and which portion of the brain is affected.

8 CARDIOVASCULAR DISEASES

SIGNS AND SYMPTOMS

Ischemic Stroke

- Blurring or decreased vision in one or both eyes.
- Severe headache, often described as 'the worst headache of my life'.
- Weakness, numbness or paralysis of the face, arm or leg, usually limited to one side of the body.
- Dizziness, loss of balance or coordination, especially when combined with other symptoms.

Brain Haemorrhage

- Acute and intense headache.
- Loss of consciousness, altered mental state.
- Seizure.
- Vomiting or severe nausea.
- Extreme hypertension.
- Weakness, numbness, or paralysis, especially on one side of the body.

DIAGNOSIS

Clinical diagnosis: careful medical history, especially concerning the onset and distribution of symptoms, and the presence of risk factors. Perform a neurological examination. When available: ultrasound scan of the carotids.

Risk Factors	
Age and sex	The risk of stroke increases with age, especially after age 55. Men are at greater risk than women.
Family	People with a family history of stroke have an increased risk of stroke themselves.
Diseases	People with diabetes, heart disease, high BP, HIV or prior stroke are at greater risk of stroke.
Lifestyle	Stroke risk increases with cigarette smoking, alcohol consumption and use of IV drugs.

EARLY TREATMENT (LESS THAN 4 HOURS)

- Identify the stroke and exclude other causes like hypoglycaemia: **REFER to a hospital.** Therapeutic treatment in a hospital should be started within 4-6 hours after the stroke: after this period brain damage is irreversible.

LONG TERM TREATMENT (MORE THAN 4 HOURS)

- Stroke subjects should be managed a dark, quiet room. Treat the pain (**see 7.5**).
- For comatose patients (**see 7.1**).
- Feeding should start within 24 hours because rehabilitation is slower in those who are not fed early. Swallowing should be assessed before feeding. Give intravenous fluids if the patient cannot swallow.
- Anti-embolic stockings may be necessary if early mobilisation is not possible.
- Chronic prophylactic **aspirin** treatment: 150 mg OD in the first 2 weeks if bleeding can be excluded, followed by 75 mg OD lifelong in all cases.

EARLY HIGH BLOOD PRESSURE IN STROKES

Most of the time, BP is very high in the first hours or days following a vascular accident. Usually this is a consequence of the stroke rather than the cause. The body is trying to increase the blood supply to the brain. By giving medication to lower BP within the first week after the stroke you could worsen the symptoms and consequences of the ischemia or bleeding. Treat only if systolic BP is over 250-280

mmHg within the first 48 hours. After this period, BP should become normal again. You can start the usual medication if needed.

REHABILITATION

Rehabilitation refers to a program designed to regain as much function as possible and compensate for permanent losses. The rehabilitation program is based on the patient's individual capabilities. Refer patients to the closest organisation specialised in rehabilitation. Such a program should include physical and mental therapy. 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. Rehabilitation may be complicated by cognitive losses, including reduced ability to understand and follow directions. Poor results are more likely in patients whose strokes leave them with prolonged cognitive changes, sensory losses, language deficits, or incontinence.

PREVENTION

Control BP, give prophylactic aspirin treatment. Advise your patient to stop smoking, do regular exercise and avoid excessive alcohol consumption.

REFERENCES Hypertension (**see 8.1**)

8.4 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 (**polyarthritis**), 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 2 cm), 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.

There can also be fever, abdominal pain, nose bleed or arthralgy (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-streptinolysin O (ASO) titre Positive throat culture for group A beta-haemolytic streptococcus	
2) Major criteria: • Heart symptoms as above: carditis, polyarthritis. • Chorea. • Subcutaneous nodules. • Erythema marginatum.	**3) Minor criteria** • Arthralgia. • Fever. • Increased ESR/CRP (signs of infection in blood test).
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 then 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 two weeks.
- **Benzathine penicillin** IM STAT 1.2 million IU. Children: 25.000-50.000 IU/kg STAT (Max 1.2 million IU). 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** in high doses until all symptoms have gone:
  Children (>12 year): 20-25 mg/kg QID, Adults 1-2 g QID
  Decrease dose if side-effects occur: ototoxicity, hyperventilation, abdominal problems or metabolic acidosis.
- Prednisolone
  Treat with prednisolone if there are signs of cardiac problems or if aspirin is not enough to control the joint inflammation:
  Children: 2 mg/kg OD for 2 w eeks, then slowly decrease over 2 weeks to stop
  Adults: 60-120 mg OD for 2 weeks, then slowly decrease over 2 weeks to stop
  Continue aspirin for a month after stopping prednisolone.
- For **Chorea**: Rest
  Diazepam or phenobarbital.
- If the patient develops **heart failure**: treat according to Heart Failure chapter (**see 8.2**).

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 1.2 million IU every 4 weeks. All dental interventions should be done under antibiotic prophylaxis.

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.

REFERENCES Pharyngitis / tonsillitis (**21.1**), Heart Failure (**8.2**).

9 DENTAL PROBLEMS

9.1 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.

Dental Caries

DEFINITION

Cavities in the tooth, that can be complicated by local infections. Risk factors are a sugar rich diet, bad natural teeth strength, bacteria and 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 or ASA.
- Treat any swelling with ASA and antibiotics (amoxicillin). 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 specialised dental team.

PREVENTION Daily cleaning of the teeth and gums.

Gum Diseases

Gum diseases do not cause much pain, so people may not realise that they are sick.

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 odour.

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 by dental team.

b) Peridontitis

DEFINITION

It is 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/ampicillin and metronidazole. Extraction of the affected tooth.

PREVENTION Daily cleaning of teeth and gums. Removal of calculus by dental team.

9.2 STOMATITIS

DEFINITION

Oral mucosa can be affected by viral, bacterial and fungal infections. Traumatic problems, systemic diseases or vitamin deficiencies may also cause sores or ulcers. Candidiasis (oral thrush) occurs frequently in infants, malnourished children and HIV infected patients. A disorder of the oral mucosa 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.

SIGNS AND SYMPTOMS Pain, difficulty eating, nausea, vomiting.

TREATMENT

- Maintain feeding and hydration. When necessary use nasogastric tube.
- Viral and bacterial infections: wash the mouth with **warm salty water** or **chlorhexidine** 0.2 %. Treat with **gentian violet**. If a secondary infection is present treat with **amoxicillin**.
- Fungal infections like thrush (Candidiasis): apply **gentian violet** after each meal. If severe or no response to GV, use nystatin (crushed tablets) or mouth tablets (to suck in the mouth).
    * If a child is dependent on breast milk, treat directly with **nystatin** (crushed tablets with powder applied to all parts of the mouth using the mother's clean finger) 4 times per day (**see skin infections 22**).
    * For treatment of HIV/AIDS patients, **see 15.3**.

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

9.1 TRAUMA

If a permanent tooth is knocked out it should be replaced (pushed back into the socket) as quickly as possible.

9 DENTAL PROBLEMS

Do not replace children's milk (primary) teeth that have been knocked out.

TREATMENT

- Treat the pain with paracetamol or ASA.
- 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.

IN CASE OF DENTAL PROCEDURES CONFIRM THAT THE PATIENT DOES NOT HAVE ANY HEART ABNORMALITY. IF YES, DISCUSS WITH DOCTOR; YOU SHOULD GIVE ANTIBIOTIC PROPHYLAXIS

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 (>40 years) and can usually be managed with tablets. If severe, it may need insulin treatment.

Risk Factors associated with type 2 Diabetes are: positive family history, BMI > 23 (BMI table in appendix (**see 24.4**) and obesity (**see 17.3**), history of diabetes in pregnancy, history of malnutrition or low birth weight.

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).

EMERGENCY TREATMENT:
A diabetic patient can present in coma:
- Check the blood sugar level (dextrostick) in every patient with coma
If the blood sugar level is high (>200 mg/dL) in a comatose patient:
- Insert an IV cannula, start NSS infusion
- Start insulin treatment (10 IE IV STAT then 0,1 IE/kg/h)
- Check blood sugar level every hour
- Consider referring the patient

DIAGNOSIS

If someone has the above symptoms, you should check them for diabetes: check the urine for glucose.
To confirm the diagnosis in patients with positive glucose in the urine, check glucose level in the 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.	> 11 mmol / L* > 200 mg/ dL

FASTING BLOOD GLUCOSE	Check Glucose Level in the morning: advise patient not to eat or drink anything except water after midnight.	> 7 mmol / L > 126 mg/dL

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

COMPLICATIONS

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

1. **Blood vessel (vascular) disease**: stroke, heart disease, heart attack, peripheral vascular disease (poor blood supply causing cold or painful feet).
2. **Kidney failure**: protein positive on urine lab stick.
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.

Normal random blood sugar levels are between
70 – 140 mg/dL(3,8 – 7,8 mmol/L)

1. EXPLANATION AND ADVICE

When you have made the diagnosis of diabetes, explain to the patient what diabetes is. Tell them that there is no cure for diabetes and that they will have this disease for life (except when diabetes present only in pregnancy - see later). 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. Advise your patient to check their feet each day to look for sores, cuts, redness or any signs of infection.

2. LIFE STYLE TREATMENT

- **Diet *** Reduce sugar (e.g. sweets, biscuits, fruit juices, soft drinks like coke, sugar cane, honey). Instead of sugar, eat starchy foods (potato, noodles, bread). These are broken down into sugar by your body but more slowly, so they do not cause a sharp rise of the blood sugar.
  - Be aware that rice and noodles raise the blood sugar.
  - Reduce animal fats and palm oil
  - Increase fibre (vegetables, fruit)
  - Do not drink alcohol
  - If overweight, lose weight: this can lower blood sugar. (**See obesity 17.3**)
- **Smoking** Advise the diabetic patient to stop smoking.
- **Exercise** Advise the patient to do some exercise: e.g. walking or playing football every day.

Some diabetics can bring their blood sugar level back to normal just by lifestyle treatment.

If, at the time of diagnosis, the random blood sugar is **140-200 mg/dL (7.7-11 mmol/L),** you could opt for lifestyle treatment first.
If it does not work after one month, then start medication.

3. MEDICATION

Start diabetic medication if the dextrostick **>200 mg/dL (11 mmol/L)**, or lifestyle treatment is not working.
The diabetic medication will need to be started by a doctor or senior medic.
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
METFORMIN	500 mg TID	1 g TID	Give with meals Preferable for patients who are overweight
GLIBENCLAMIDE	5 mg OD Elderly people: 2.5 mg OD	15 mg OD	Give with breakfast

- Start with metformin, increase the dose slowly to 1 gram TID.
- If blood sugar level are not normal with metformine treatment, add glibenclamide.
- If the patient takes diabetic medication but does not eat, or does not eat regularly, he will be at risk of going into hypoglycaemia (too low blood sugar): explain this very carefully to the patient, teach him how to recognise symptoms of hypoglycaemia and how to treat it (eat sugary drink/food).

Add **Insulin** if there is not enough response with oral anti-diabetics. INSULIN NPH 70/30 retard (long acting) or INSULIN regular (short acting) are used for diabetes treatment.

- Refer to IPD to start insulin treatment.
- Start with 10 I.E. of Insulin NPS at night time (use the short acting insulin at dinner time).
- For increasing the insulin dose see table below, consider BID treatment and discuss your plan with the doctor.

If fasting blood sugar	Plan for Insulin
>180 mg/dL	Add 4 IE
125 – 180 mg/dL	Add 2 IE
80 – 125 mg/ dL	Continue same dose
< 80 mg/dL	Decrease 2 -4 IE

4. FOLLOW UP CONSULTATION

The aim is to educate, achieve good blood sugar levels (normal range 70-140 mg/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 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 (eat a tablespoon of sugar).

10 ENDOCRINE DISEASES

ASK

- 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 according to table on **8.1.**
- Feet for infection, wounds, numbness.

Every 12 months:

- Urine lab stick for protein (kidney damage).
- The heart, look for signs of heart failure.
- Test vision in Eye Clinic; look for cataract.

CHECK RANDOM BLOOD SUGAR LEVEL

	VERY GOOD	GOOD	TOO LOW	TOO HIGH
BLOOD SUGAR LEVEL	>70 < 140 mg/dL >3.8 < 7.7 mmol/L	< 180 mg/dL < 10 mmol/L	< 70 mg/dL < 3.8 mmol/L	> 180 mg/dL > 10 mmol/L
WHAT TO DO	Continue same treatment		- Check if patient is eating regularly. If yes: reduce medication If not: give education - Treat hypoglycaemic symptoms (see below)	- 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

A pregnant woman who has diabetes before pregnancy or develops it during pregnancy will require insulin treatment if sugar levels cannot be controlled with diet alone. Oral tablets cannot be used in pregnancy. Refer to hospital or discuss with the doctor.

Pregnant diabetic women have higher rates of stillbirth, pre-eclampsia, premature labour and very large babies (or less commonly, very small babies)

PREVENTION See lifestyle treatment.

REFERENCES Eye diseases (**11**), Cardio vascular diseases (**8**), Obesity (**17.3**), BMI table (**24.5**).

Hypoglycaemia

DEFINITION

Hypoglycaemia occurs when the blood sugar level <70 mg/dL (< 3,8 mmol/L).
(for cases of acute severe malaria, a blood sugar level below 40 mg/dL (2.2 mmol/L) is diagnosed as hypoglycaemia.)

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.

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 able to drink, give the patient oral sugar solution (mix sugar with water) or a sweet drink. This will raise the blood sugar for only a short time, so advise the patient to eat a meal.
- If the patient is in a coma or not able to drink: admit to IPD, give 50ml 50% Dextrose IV STAT. When awake, give the patient oral sugar solution.
- Review the anti-diabetic medication dose with a doctor or senior medic.

PREVENTION

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

REFERENCES Diabetes Mellitus (**10.1**), Malaria (**15.2**).

10.2 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 and F-T4), which circulate in the bloodstream and control the metabolism. Thyroid hormones influence virtually 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).

You can detect the two main thyroid disorders by measuring TSH and F-T4 in the blood of a patient.

TSH	F-T4	Conclusion
normal	normal	No thyroid problem
↑	↓	hypothyroid
↑	normal	sub clinical hypothyroid
↓	↑	hyperthyroid
↓	normal	sub clinical hyperthyroid

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.
- Laboratory test: TSH, FT4.

TREATMENT

- Sub clinical hypothyroid (high TSH, normal T4): wait and see.
- Hypothyroid: **thyroxin** 0.1 mg tablet

< 65 yr:

Start : 0.1 mg for 1 month (1OD), then
0.15 mg for 1 month (1.5 OD)

Check TSH/FT4 after 2 months and adjust dose in steps of 0,05 mg. Control TSH/FT4 monthly until in normal range.
If TSH/FT4 is in normal range check TSH/FT4 every 6 months and adjust dose with 0.025 mg (1/4 OD).

> 65 yr:

Start : 0.025 mg 1 month (1/4 OD)

Control TSH/FT4 to see if they are within normal range. Adjust in steps of 0,025 mg. Control TSH/FT4 monthly until in normal range.
After TSH/FT4 normal check TSH/FT4 every 6 months and adjust dose with 0.025 mg (1/4 OD).

FOLLOW UP

Initial treatment phase: Ask the patient to come back every month for 3 months.
Measure TSH and FT4 every 2 months until normal values.

After initial treatment phase: Ask the patient to come back every 3 months.
Measure TSH and FT4 every 6 months.

Hyperthyroidism

DEFINITION

Overactivity of the thyroid gland.

SIGNS AND SYMPTOMS:

- Diarrhoea
- Nervousness
- Weight loss
- Warm
- Sweatiness
- Exophthalmia
- Tachycardia, palpitations
- Tremors in the hands.

DIAGNOSIS

- Clinical: check pulse rate, feel thyroid gland (goitre, nodules).
- Laboratory test: TSH and FT4 (after 1 month then every 3 months).
- Hydatidiform molar pregnancy can cause symptoms that look like hyperthyroidism.

TREATMENT

- **Propyl Thio Uracyl (PTU)** 50 mg tablet (this is an anti-thyroid drug which will stop the thyroid malfunction).
- Start **PTU** 200-400 mg OD (4-8 tablets OD).
- Control thyroid function (TSH, FT4) after 1 month, then every 3 months.
- When TSH, FT4 and clinical signs are becoming normal: slowly decrease dose with 50 mg per 2 months to 50 -150 mg daily OD.
- Continue treatment for 12 to 24 months, then discontinue. Follow clinical symptoms.
- For rapid symptomatic treatment of tachycardia and palpitations give **propranolol**.

FOLLOW UP

Initial phase (3 months): every month.
After initial phase: every 2 -3 months.

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.

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 medication with their doctor.

REFERENCES

Hydatidiform mole (**19.6**)

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 dietary iodine is deficient. Iodine is essential for the production of thyroid hormone and deficiency impairs synthesis. 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.

10 ENDOCRINE DISEASES

DIAGNOSIS

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 FT4 if symptoms of thyroid disease.

Complications:
Pain or a sense of fullness in the neck is common. Compression of the trachea and/or oesophagus leading to dyspnoea and/or dysphagia (rare) is a reason for surgical intervention.

TREATMENT

Give 1 dose of iodized oil, repeat after 1 year.

Iodized oil: 200 milligram capsule as a single yearly oral dose.	
Children < 1 year	1 capsule
Children 1-5 years	2 capsules
Children 5-16 years	3 to 4 capsules
Pregnant women	2 capsules
Adults, especially women of childbearing age	3 to 4 capsules.

- In children, goitre disappears slowly after several months. In adults, it disappears more slowly or never, despite restoration of normal thyroid function.
- A few patients will develop hyperthyroidism and require treatment for that condition.
- Surgery is only indicated for patients who have such a large mass that it gives local compression on the neck (airway or bloodvessels).

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.

REFERENCES

Hyper- or hypothyroidism (**10.2**).

Note: see the 'Burma Border Primary Eye Care Manual' for more detailed information.

11.1 POOR VISION (REFRACTION ERROR)

Use of a **PINHOLE** will help to establish whether a person needs eyeglasses.
If vision improves when looking through a pinhole, then eyeglasses are needed.

(a) Poor vision all of the time

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).

(b) Poor near vision (Longsightedness)

Commonly know 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 in 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).

(c) 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. (Case example: schoolchildren who cannot read the blackboard).
This is called Myopia. For this condition, vision can be corrected with minus power lens eyeglasses.

(d) Poor vision at dusk and at night

Night blindness is one of the early signs of vitamin A deficiency. On the Thailand/ Burma 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 17.2**).

11.2 INFECTIONS

Conjunctivitis and General Infections

DEFINITION

Bacterial or viral infection, or allergic reaction, of the conjunctivae of one or two eyes. It is sometimes difficult to establish whether an eye inflammation is due to infection (bacterial or viral), allergy, irritation or other causes.

SIGNS AND SYMPTOMS

- Red eye
- Bacterial infection often produces a pus discharge which usually responds to Terramycin Eye Ointment (TEO)
- Viral infections often produce a watery discharge. Viral infections do **not** respond to TEO treatment but will usually disappear within one week without complications. In the rainy season there are often outbreaks of viral conjunctivitis. This may affect up to 20-30% of the camp population
- Allergic conjunctivitis does **not** respond to TEO treatment. Symptoms can be reduced by washing the eyes with clean water. It is often not possible to determine the cause of eye allergy.

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

DIAGNOSIS Clinical.

TREATMENT

The only eye medicine that is available at all border locations is **Terramycine Eye Ointment (TEO)**. Although TEO contains tetracycline, it is safe to use ointment in children, pregnant and breast-feeding women.

- Antibiotic ointment **TEO**: apply QID until two tubes are finished.
- If no response to TEO: use **chloramphenicol** eye drops.
- Hot compresses may help reduce swelling.
- Show your patient how to put ointment in the eye. Mothers may need to help their children putting eye ointment in the eyes. Tell the patient to wash their hands and face before 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 to treatment

PREVENTION

Personal hygiene, wash hands regularly.

REFERENCES

Burma Border Primary Eye Care Manual.

Trachoma

DEFINITION

Trachoma is an 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 5 clinical states of trachoma:

1. Trachoma with Follicles (TF)

The first sign of a trachoma infection is the presence of a follicle (small bumps) below the top eyelid. These small bumps are white or yellow in colour. If there are five or more follicles in the middle part of the top eyelid, this is the first stage of trachoma.

2. Trachoma with Inflammation (TI)

Under the upper eyelid there is redness. Sometimes you will see inflammation and follicles together. The inflammation will make it difficult to see normal blood vessels under the top of eyelid.

3. Trachoma with Scarring (TS)

If a person has a trachoma infection for some time, scar tissue can form. Under the upper eyelid there will be white areas and you cannot see the normal blood vessels. It will be difficult to turn over the eyelid for examination.

4. Trachoma with Trichiasis (TT)

If there is severe scarring on the eyelid, the eyelashes turn in towards the cornea. This condition is called trichiasis.

5. Corneal Opacity (CO)

When the eyelashes are turned in (trichiasis), they rub on the cornea. This rubbing can lead to a corneal scarring. Bacteria or viruses can easily infect the scratched cornea. The trichiasis scar can cause vision loss. If there is secondary infection of the cornea it will become seriously scarred. This can lead to blindness.

DIAGNOSIS

is 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. Diagnosis should be made by a medic who has been trained in eye care.

TREATMENT (ACUTE PHASE) STAGE 1 AND 2

- Wash eyes and face four times a day (before using TEO).
- Apply TEO in both eyes QID. Continue treatment for total 4 tubes
  AND
- Azithromycin STAT (child 20 mg/kg, adult 1 gram) or
  doxycycline (100mg BD 2-3 weeks) if age > 8 years.
- Check all other family members for possible infection.

- Advise the patient to return to the clinic when treatment is finished for re-evaluation, as sometimes a second round of treatment is needed.

If you have enough TEO, prescribe TEO treatment to all members in the patient's family

TREATMENT (LATE PHASE) STAGE 3-5

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 (cornea opacity).

- All eyelashes that turn in need to be removed with forceps on a weekly basis to prevent further damage to the cornea and vision loss.
- In some cases surgery is helpful. These patients should be referred to a medic who has had eye training.
-

PREVENTION Health education on hygiene and sanitation.

REFERENCES Burma Border Primary Eye Care Manual; (**4**), STI (**13.5**).

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.

TREATMENT

- Clean the eye carefully with a large amount of Normal Saline Solution or clean water.
- Remove any foreign bodies. Look carefully at 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).
- Apply a pressure patch to the eye if the cornea is scratched. 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 EYE DISEASES

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

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). Diagnosis is reached by looking through the pupil: the affected lens will be cloudy white in colour. Cataracts are probably the leading cause of blindness on the Thailand/ Burma border.

There are no medicines that can treat cataract. Only surgery will help.

Pterygium

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.

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

Treatment for a pterygium is surgery. A 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.
However, a 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

Glaucoma is a disease of the **optic nerve** which gets progressively damaged by **high intra ocular pressure**. As the optic nerve gets damaged, the patient loses eyesight. This type of damage is **irreversible**.

SIGNS OF GLAUCOMA

- Raised Intra Ocular Pressure (IOP normal range 10mm - 22mmHg).
- Optic disc cupping (seen with fundoscopy).
- Field vision loss (irreversible).
- In advanced glaucoma, the patient has abnormal pupil reactions to light due to loss of the optic nerve. Most types of glaucoma are painless and progress slowly and silently. The IOP is raised above 22 mmHg (mostly between 30 and 60 mmHg).

HOW TO DIAGNOSE GLAUCOMA

- Measure IOP (with eye pressure tool)
- Look at depth of anterior chamber
- Check eye visual fields (confrontation test)
- Check light perception
- Check pupil reaction.

If you see a suspected case of glaucoma, please refer the patient to an Ophthalmologist.

TREATMENT

- Surgery (trabeculectomy or irredectomy).
- After surgery, patients should have regular IOP checks and control of glaucoma medication.

Strabismus

Strabismus (squint) is when the eyes do not look in the same direction. A sudden onset squint in a child or adult is worrying and the patient must be referred to a doctor straight away. Listen to the parents, as they are the most likely to notice a squint in an infant.

CAUSES OF SQUINT

- Congenital and retarded development.
- Parent's history of wearing eyeglasses with high power.
- History of injury to the part of the eyes.

TESTING FOR A SQUINT

1. 47. 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. 48. Shine the light in to the eyes while asking the child 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. 49. Children old enough to cooperate with a visual perception test should be assessed.

MANAGEMENT

If you detect a squint, the child should be referred to an eye clinic for immediate treatment. If it is not treated by 7 years of age the child can loose sight permanently in that eye. If no eye clinic is available, eye patching can be used. This involves covering the GOOD eye, forcing the other eye to work harder. The patch is used every day until there is no more improvement (can take up 2-3 months).

11.5 XEROPHTHALMIA

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.

The clinical stages of xerophthalmia:

1. **Night Blindness** Vitamin A deficiency can cause poor night vision. This symptom is known as 'night blindness' or 'chicken blindness', and is often the first sign of xerophthalmia.
2. **Conjunctival dryness (Conjunctival xerosis).** Vitamin A deficiency causes 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.
Vitamin A deficiency can occur in anyone, but usually affects children between one and six years old. Most babies who are breast-fed will not develop vitamin A deficiency.

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.
- All patients seen with corneal ulcers/ keratomalacia must be seen by a doctor.
- Vitamin A treatment (see Vitamin A deficiency **chapter 17.2**):
- **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 (>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**
  10,000 IU OD for two weeks
  or 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 for 2 weeks or
    Vitamin A 25,000 IU PO/ week for 8 weeks
  * In case of **corneal dryness** and **corneal ulcer/ keratomalacia**:

Day of diagnosis	(day 1)	100,000 IU
Next day	(day 2)	100,000 IU
1 Week later	(day 8)	100,000 IU

    (This schedule should only be given by a DOCTOR)

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.

11 EYE DISEASES

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).

REFERENCES: Vitamin A deficiency (**17.2**).

12.1 DIARRHOEA

SURVEILLANCE
See appendix

DEFINITION

Diarrhoea is a symptom and not a disease. A diarrhoeal episode that lasts more than 2 weeks is defined as chronic diarrhoea (Note: causes and treatments for chronic diarrhoea are different then for acute diarrhoea). Acute diarrhoea is defined as an increase in the number (>3/day) and the volume (>300g/day) of stools passed over a period of 14 days. Acute diarrhoea can have many different causes (gastrointestinal infection, food poisoning, surgical problems, or other diseases).

Management of diarrhoea:
- Recognise the syndrome: diarrhoea without blood or with blood (dysentery).
- Evaluate hydration.
- Choose a treatment and/or a follow up.

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

DIARRHOEA WITHOUT BLOOD

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

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.

SIGNS AND SYMPTOMS

- How many days has the patient had diarrhoea?
- Is it watery or with blood?
- Is there abdominal pain, rectal pain after passing stool (tenesmus), fever or vomiting?

Table 1: Acute diarrhoea

	DIARRHOEA WITHOUT BLOOD	DYSENTERIC DIARRHOEA
Signs	Sometimes fever Slight abdominal pain Vomiting	High Fever Considerable 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 15.2**), otitis media (**see 21.1**), pneumonia (**see 21.2**), meningitis (**see 15.1**) or UTI (**see 13.1**).
- Look for signs of purging watery diarrhoea or repeated vomiting. Think of **Cholera** (**12.2**).
- If the patient has **abdominal signs**: a tender abdomen or abdominal distension, think of surgical causes (obstruction or perforation).
- When a child has **chronic diarrhoea** (>2 weeks) think of malnutrition and chronic diseases (see malnutrition section **17.1**).
- In babies, always think of changes in feeding. Diarrhoea is very common when the mother starts bottle-feeding (other possible causes: water not sterilised or the bottle is dirty).

EVALUATION OF DEHYDRATION

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)

	Plan A **No Dehydration**	**Plan B** **Mild Dehydration** 2 or more of:	**Plan C** **Severe Dehydration** 2 or more of:
General conditions	Normal	Agitated	Very tired or unconscious
Eyes	Normal	Slight sunken	Deeply sunken
Tears	Present	Absent	Absent
Mouth and Tongue	Moist	Dry	Very dry
Drinks thirstily	None	Important	Not able to drink
Skin pinch	Goes back normally	Goes back slowly	Goes back very slowly

TREATMENT OF DEHYDRATION

WHO plan A to treat diarrhoea at home

- The patient has no signs of dehydration. There is no need to hospitalise in IPD.
- Tell the mother to breastfeed more frequently and for longer each time. If not breastfeeding, give **Oral Rehydration Solution (ORS)** (see appendix) or other food-based liquids (soup, boiled rice water - see appendix 24.6 Oral rehydration -, yoghurt drinks) until the diarrhoea stops.
- Give the child plenty of food to prevent undernutrition. If the child takes solid food, advise extra cereals, fresh fruit and vegetables, and add 1-2 spoons of vegetable oil to each meal for two weeks.
- Explain to the mother how to prepare ORS or boiled rice water (see appendix).

- Ask the mother to quantify the intake of water a day, and follow up 2 times a week.

In addition to the usual fluid intake, tell the mother to give:	
< 2 years	50-100 ml ORS after each loose stool
> 2 years	100-200 ml ORS after each loose stool

ZINC supplements:
Tell the mother how much ZINC to give:
< 6 months of age: 1/2 tablet of 20 milligram per day for 14 days
> 6 months of age: 1 tablet of 20 milligram per day for 14 days

Show the mother how to give Zinc supplements:
Infants: dissolve the tablet in a small amount of expressed breast milk, ORS or clean water; in a spoon.
Older children: tablets can be chewed or dissolved in a small amount of clean water in a cup or spoon.
Remind the mother to give the ZINC supplements for the full 14 days.

- Advise the mother to return or show the child to a health worker if the child:
  - Passes many stools
  - Is very thirsty
  - Has sunken eyes

(The above 3 signs suggest the child is dehydrated)

  - Seems not to be getting better after 3 days
  - Has a fever
  - Does not eat or drink normally.

The 4 Rules of Home Treatment:
GIVE EXTRA FLUID (see Plan A for recommended fluids)
GIVE ZINC SUPPLEMENTS
CONTINUE FEEDING
MAKE A RETURN APPOINTMENT TO THE DOCTOR

WHO Plan B to treat dehydration

- Hospitalise IPD.
- The first 4 hours, give ORS as written in Table 3.
- If the child wants more ORS than recommended, give more.
- Encourage the mother to continue breastfeeding.
- After 4 hours, re-evaluate hydration (see Table 2) and re-evaluate the plan to follow (if still plan B: repeat Table 2 for 4 hours).

Table 3: approximate amount of ORS to give in the first 4 hours

AGE	< 4 month	4-12 month	12 month – 2 years	2-5 years	5-14 years	>14 years
Weight	< 6 kg	6 - <10 kg	10 - <12 kg	12-19 kg	19-29.9 kg	>30 kg
ORS in ml	200-400	400-700	700-900	900-1400	1400-2200	2200-4000

- After 4 hours, re-evaluate hydration.

- After rehydrating the child, follow plan A.
- If still dehydrated, repeat plan B.

WHO Plan C to treat severe dehydration:

- Hospitalise IPD: give intravenous hydration with Ringer lactate according to Table 4.
- Evaluate clinical condition every 15 minutes.
- If the full amount of IV rehydration has been given (6 hours for infant and 3 hours for adults): re-evaluate hydration and apply plan A, B, or C.
- If no IV perfusion available, give ORS by nasogastric tube: 20ml/kg/hours for 6 hours. Check clinical condition as for IV infusion.
- Keep patient in IPD for at least 24 hours and until etiologic diagnosis is made.
- If you suspect cholera, consider antibiotic treatment (**see 12.2**).
- After rehydrating the child follow Plan A.

Table 4: IV rehydration with Ringer's solution

	First give **30 ml/kg** in	Then give **70 ml/kg** in
< 12 months	1 hour	5 hour
> 12 months	30 minutes	2.5 hours

Remember: drops/min = $\frac{\text{ccx}}{\text{Hr}}$ x $\frac{\text{drop in 1 cc}}{60}$

Example: I want to give 500cc in 5 hours. There are 20 drops in 1cc.
Then drops/min = 500/5 x 20/60 = 33 drops/min

TREATMENT

General principles:

- Prevent or treat dehydration (Treatment Plan A, B or C).
- Prevent malnutrition (Treatment Plan A).
- Give ZINC supplements.
- Only give antibiotics for certain causes (see below).
- Do not give anti-diarrhoeal drugs (like loperamide).
- Give vitamin A to children under 12 years that require admission in IPD.

Patients with watery diarrhoea do NOT need antibiotics. They only need REHYDRATION

DIARRHOEA WITHOUT BLOOD

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 12.2**). 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 any patient older than 2 years has acute watery diarrhoea when cholera is known to be present in the area. Younger children also develop cholera, but the illness may be difficult to distinguish from other causes of acute watery diarrhoea, especially rotavirus. 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 (infant: 15 mg/kg divided in 3 doses for 5 days, adults: 2 g/day OD for 3 days).**

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

DYSENTERY – DIARRHOEA WITH BLOOD

There are two types of dysentery:

Bacterial: Several types of bacteria cause dysentery, the most severe form is Shigella. Associated symptoms: fever, rectal pain after passing stools (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 liver abscess 12.3**).

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):

PATIENTS AT RISK
1. Children under 2 years old.
2. Patient over 50 years old.
3. Malnourished children (<80% of the median Z SCORE).
4. High fever >39 C.
5. Signs of severe dehydration.
6. Signs of confusion, seizures or coma.

1. NO FEVER

- Treat dehydration using the protocol (see above).
- Treat in OPD if the patient's condition stabilises.
- Admit to IPD if the patient is **at risk**. Treat in diarrhoea ward to prevent spreading.
- Prescribe **metronidazole**: Child 10 mg/kg TID x 7 days; Adult: 750-800 mg TID x 7 days

Metronidazole doses for amoeba are higher than usual. Follow the recommended dose given here.

- Give **vitamin A** to children under 12 years if not received in the past 4 months (**see 17.2**).

2. FEVER

- Treat dehydration using the protocol (see above).
- Treat in OPD if the patient's condition stabilises.
- Admit to IPD if patient is **at risk**. Treat in diarrhoea ward to prevent spreading.
- Treat the fever (**see 7.4**).
- Prescribe **miprofloxacin** Child: 10 mg/kg BD x 5 days; Adult: 500 mg BD X 5 days
  AND **metronidazole**: Child 10 mg/kg TID x 7 days; Adult: 750-800 mg TID x 7 days
- Give **vitamin A** to children under 12 years if not received in the past 4 months. (**see 17.2**).
- Ensure sufficient food intake: breast-feeding for babies and normal diet for older children and adults.
- Watch for complications: abdominal distension, perforation, sepsis.

Note: If laboratory testing is available, a stool-test should be carried out to differentiate between amoebic and bacillary diarrhoea. 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 and/or mothers to prevent diarrhoea:

- Wash hands with soap and water before eating, preparing food and after visiting the latrine.
- Breastfeed babies.
- Boil drinking water if not chlorinated.
- Cook food well and keep it covered.
- Use latrines. Clean children carefully after passing stools.
- Do not use chronic antacid (like aluminium); gastric acidity helps to fight bacteria.

VACCINE

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

REFERENCES

Malaria (**15.2**), otitis media(**21.1**), pneumonia (**21.2**), meningitis (**15.1**), UTI (**13.1**), cholera (**12.2**).

12.2 CHOLERA

URGENT REPORT
SEE APPENDIX

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 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, potassium depletion 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. Note: People with blood type 0 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. cholerae.

TREATMENT

- Rapid replacement of lost fluid and electrolytes through immediate oral or IV rehydration. A patient needs 10-15 litres of fluid the first day.
- Rehydrate with Ringers lactate with careful substitution of potassium after 24h fluid substitution. Check potassium if possible. If hypokalemia, add 1-2 ampoules of 10 ml 10% in one litre Ringers lactate.
- Antimicrobial therapy is helpful but not essential, although it can reduce the duration of illness, the volume of stools and the duration of passing vibrios in the faeces.
- Several antibiotics are recommended by WHO (doxycycline, tetracycline, trimethoprim-sulfamethoxazole, erythromycin, chloramphenicol or ciprofloxacin). Recent resistance information from Mae Sot hospital shows high resistance to tetracycline, trimethoprim-sulfamethoxazole. From these data the recommended antibiotic treatment on the Thailand/ Burma border is **ciprofloxacin 1 gram STAT dose**. **Note**: It is recommended to check for resistance in your clinic before starting treatment.

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.

REFERENCES Diarrhoea (**12.1**).

12.3 LIVER DISEASES

Hepatitis

DEFINITION

Hepatitis is an inflammation of the liver. Several different types of hepatitis virus are known: acute hepatitis is usually caused by hepatitis A, which is spread by the faeco-oral route. Acute hepatitis also occurs in infections like leptospirosis. Non-infectious acute hepatitis can be caused by alcohol intoxication. Hepatitis B virus is a less common cause of acute viral hepatitis. It is spread by blood, body fluids and sexual intercourse. Acute viral hepatitis affects the whole body but mainly the liver. Hepatitis B infection can also cause hepatocellular carcinoma. Anti TB drugs, HIV drugs and drugs for leprosy can cause hepatitis. For other types of the virus see medical handbooks.

SIGNS AND SYMPTOMS

- Jaundice (gets worse for 2 weeks then slowly improves)
- Malaise, mild fever, loss of appetite, nausea and vomiting
- Right upper quadrant pain
- Smooth, tender and slightly enlarged liver
- Dark urine, stools not pale.

DIAGNOSIS Liver function test (AST/ALT), specific antibodies.

TREATMENT

- Supportive treatment only: if the patient is dehydrated, or cannot eat or drink, admit to IPD.
- Encourage the patient to drink, or give dextrose 5% IV.
- No alcohol should be taken.
- Treat primary infection (e.g. leptospirosis).
- If the patient is taking drugs that could affect the liver, stop the drugs and refer to the doctor.

PREVENTION

Hepatitis A: improvement of sanitation.
Hepatitis B: general precautions for health workers and vaccination.

VACCINATION Hepatitis B vaccine at 0, 6 and 14 weeks of life.

REFERENCES Vaccination table (appendix), general precautions health workers (**5**).

Liver Cirrhosis

DEFINITION Cirrhosis is a chronic disease that destroys the cells of the liver and replaces them with scar tissue.
Previous infection with the Hepatitis B (or C) virus is a common cause. Chronic alcohol abuse can cause cirrhosis. Cirrhosis of the liver can also be the result of recurrent haemolysis due to blood disorders.
In the long-term, this disease could result in liver failure, encephalopathy, hypoglycaemia, bleeding, ascites, infections.

SIGNS AND SYMPTOMS

- Jaundice
- Malaise, weakness, bodily itching
- Red palmar side of hands (palmar erythema)
- Slow hand tremor
- Ascites, oedema of the legs and back
- Enlarged spleen, gastrointestinal bleeding
- Muscle wasting
- Spider naevi (red spider-like blood vessels on the skin).

DIAGNOSIS Liver function test (AST/ALT). Ultrasound of liver, if available.

TREATMENT

It is not possible to cure cirrhosis, only to control the symptoms and to delay liver failure:

- Nutrition: high protein, low salt diet.
- In case of acute gastrointestinal bleeding: blood transfusion and vitamin K 1 mg IM.
- For prevention of gastro intestinal bleeding: give omeprazole (**see 7.5**).
- Monitor BP, as HBP is a risk for bleeding.
- In case of oedema and ascites: give Spironolactone or Furosemide.

PREVENTION Stop alcohol intake and drugs that cause liver toxicity (e.g. anti TB and leprosy drugs).

REFERENCES Gastro intestinal bleeding (**7.5**)

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.

SIGNS AND SYMPTOMS

- Pain comes in waves (colicky) and radiates 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.
- Pentazocine IM or SC.
- If the pain persists after two injections of buscopan/pentazocine: consult a doctor.
- Worm treatment (**see 12.4**)

PREVENTION Regular deworming (e.g. of pregnant women), intake of a healthy, low fat diet.

REFERENCES Worm treatment (**12.4**), pain (**7.5**)

Acute cholecystitis

DEFINITION

Acute cholecystitis is a bacterial infection of the gall bladder mostly due to obstruction of the gall ducts. It may follow an attack of biliary colic. Cholecystitis can also be due to malnourishment or typhoid fever.

SIGNS AND SYMPTOMS

- Pain, tenderness and guarding in right upper quadrant (RUQ)
- Vomiting
- Fever, rigors
- Jaundice.

DIAGNOSIS

Clinical; specific sign is the pain during deep inspiration when the RUQ is palpated, and no pain if this procedure is performed on the LUQ. Ultrasound of the gallbladder to reveal stones, if available.

COMPLICATIONS Empyema (gallbladder fills with pus), Peritonitis.

TREATMENT

- Bed rest, pain relief (buscopan IV or IM, codeine or tramadol)
- Nil by mouth

- Intravenous fluids
- Ceftriaxone 1 gram IV OD and metronidazole 500 mg IV TID until fever settles then oral ciprofloxacin and metronidazole 500 mg TID total 10 days
- Consider surgical removal of gallbladder. Without surgery recurrence is 25%.

PREVENTION Surgical removal of the gallbladder will prevent further attacks of cholecystitis.

REFERENCES Liver abscess, typhoid fever (**15.1**), malnutrition (**17.1**).

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 (hepatomagely) 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/septic):
- Start **metronidazole** PO Child 7.5 – 10 mg / kg TID
  Adult: 750-800 mg TID
- If patient improves, continue for 14 days
- If patient not improving after 3-5 days, follow unwell/septic protocol.

If the patient is unwell/septic:
- Start **IV ampicillin, gentamicin and PO/IV metronidazole (same dose as above).** Continue for 14 days (stop gentamicin after 8 days).

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.

REFERENCES Dysentery (**12.1**).

12.4 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 (a) prevent anaemia and malnutrition and (b) 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.

Soil-transmitted helminths

DEFINITION

Examples of soil-transmitted helminths are ascaris, hookworm and trichuris. These parasites (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, or through penetration of the skin by walking with bare feet. 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
- Abdominal pain
- Epigastric pain is very common, especially with hookworm infection
- Enlarged, swollen abdomen
- Itching anus
- Chronic anaemia
- Malnutrition
- Complications: ascaris pneumonitis; intestinal obstruction, jaundice.

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. Complete blood count shows eosinophilia.

TREATMENT

Adults and Children > 1 year of age: (Note: for pregnant women **NOT** in first trimester)
- Mebendazole 100 mg BID x 3 days OR
- Albendazole 400 mg STAT (children 12-24 months 200 mg STAT)

Treat any associated anaemia (especially hookworm) (**see 14.1**)

Mass deworming projects are recommended for all schoolchildren and pregnant women in the second and third trimester of pregnancy in areas where helminths are endemic

PREVENTION

Advise people to use latrines, wash hands after passing stools and before eating/cooking, wear shoes.

REFERENCES Anaemia (**14.1**), liver diseases (**12.3**)

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. Eating undercooked meat (e.g. cattle, pigs) can be infective.

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), nodules can be found in the skin or muscles. In neuro cysticercosis, cysts in the brain cause seizures and epilepsy.

DIAGNOSIS Stool microscopy test.

TREATMENT

• **Praziquantel**	For child > 4 years and adult:	20mg/kg STAT OR	1 gram STAT
• **Niclosamide**	Child: < 10 kg:	11-35 kg:	500 mg STAT
	Adult:		2 gram 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.

REFERENCES Anaemia (**14.1**), epilepsy (**20.1**)

13.1 URINARY TRACT INFECTIONS (UTI)

DEFINITION

- **Urinary Tract Infection (UTI):** acute or chronic inflammation of one or more parts of the urinary tract;
- **Cystitis:** inflammation of the bladder;
- **Urethritis:** inflammation of the urethra (**see 13.5**);
- **Prostatitis:** inflammation of the prostate gland;
- **Pyelonephritis: inflammation of** the kidney, but other parts of the urinary tract will be affected as well.

Diabetes Mellitus is a risk factor. 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 of urinary tract infection:

- Ordinary bacteria, usually *E.Coli*, can cause acute or chronic UTI
- Tuberculosis bacteria causes chronic UTI
- Sexually Transmitted Infections (STI)
- Urethral catheter
- Obstruction of urinary tract with stones or mass or congenital abnormality
- Intercourse
- Pregnancy
- No special cause in some females

UTIs in men are rare unless they have prostatitis, STIs, renal stones or, if elderly, because of an enlargement of the prostate. 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.

All children with recurrent UTIs 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.

Cystitis

DEFINITION

Infection of the bladder, very common in women.

SYMPTOMS & SIGNS

- Pain or burning when passing urine (Dysuria)
- No fever
- Cloudy urine
- Blood in urine (Haematuria)
- Frequent urination
- Pain and tenderness in the lower abdomen

DIAGNOSIS

- Inspection of urine: cloudy or bloody urine
- Urine dipstick: positive for leucocytes and nitrites
- Urine microscopy (sediment): positive for white cells, red cells and bacteria

In cases of recurrent cystitis, think about bladder stone or STIs.
Men do not usually get cystitis. Think about STIs (**13.5**) in a man with UTI symptoms.
Recurrent UTIs in children should be investigated to prevent kidney damage

TREATMENT

- Treatment in OPD; drink plenty of water (3-4 litres/day for adults)
- Antibiotic treatment has to be chosen according to the local resistance patterns.
- Treatment schemes could be:
  Cotrimoxazole 960 mg BID (high resistance in some camps)
  or
  Nitrofurantoin 100 mg QID (best taken with food) (Note: do not use in late pregnancy)
  or
  Oral cephalosporin (e.g. cephalexin 500 mg BID for 3 days).

Duration of treatment:

Provide antibiotic treatment for 3 days for the first episode of UTI in women.
Provide 7 days antibiotic treatment in men, pregnant women and children.

If no response or if the UTI recurs within 8 weeks:
Send urine for culture and sensitivity and give first line treatment again.
Ask the patient to come back in 5 days or sooner if fever starts. If there is resistance, treat according to the sensitivity test.
Note: Ciprofloxacin can be used in pregnancy when other antibiotics are resistant.

Note: Nitrofurantoin and ciprofloxacin can cause haemolysis in G6PD deficiency. (**see 14.3**)
Advise your patient to stop the drug and to return to IPD if symptoms of jaundice or dark urine occur

PREVENTION OF CYSTITIS AND PYELONEPHRITIS

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

Pyelonephritis

DEFINITION

Inflammation of the kidney, but other parts of the urinary tract may also be affected.

SYMPTOMS & SIGNS

- High fever, chills
- Pain and tenderness in the back or kidney area
- Cloudy urine; blood in urine (haematuria)
- Pain or burning when passing urine (Dysuria)
- Frequent urination
- Sepsis

DIAGNOSIS

- Examine urine: cloudy or bloody urine
- Urine dipstick: positive for leucocytes and nitrite
- Urine microscopy (sediment): positive for white cells, red cells and bacteria
- Ultrasound (if available) to detect structural kidney abnormalities.

TREATMENT

- Treat in IPD until the patient's temperature returns to normal
- Prevent dehydration. If the patient cannot drink, give IV fluids and monitor urine output
- Drink plenty of water (3-4 litres/day for adults)
- Treat pain and fever (**see 7.4 & 7.5**)
- **Ciprofloxacin** 500 mg BD oral for **14 days**
  (Ciprofloxacin can be used in pregnancy when other antibiotics are resistant)
  or
  Oral cephalosporin (e.g. cephalexin 1 gram TID for 14 days)
- If the patient cannot take oral medication: **ceftriaxone** 1 gram OD IV/IM until the patient can tolerate oral medication.

PREVENTION OF CYSTITIS AND PYELONEPHRITIS:

Drink at least 2 litres of water per day. Urinate before bedtime and immediately after intercourse. Avoid constipation - constipation reduces the bladder's ability to empty.

REFERENCES STI (**13.5**)

Urethritis

(see 13.5)

Prostatitis

DEFINITION

Inflammation of the prostate.

SYMPTOMS & SIGNS

- Fever
- Pain and tenderness in the rectum
- Very painful rectal examination
- Cloudy urine
- Blood in urine (haematuria)
- Pain or burning when passing urine (dysuria)
- Frequent urination

DIAGNOSIS

- Rectal examination.
- Examine urine: cloudy or bloody urine.
- Urine dipstick: positive for leucocytes and nitrites.
- Urine microscopy (sediment): positive for white cells, red cells and bacteria.

TREATMENT

- Treat in IPD until the patient's temperature returns to normal.
- Prevent dehydration. If the patient cannot drink, give IV fluids and monitor urine output.

- Drink plenty of water (3-4 litres/day for adults).
- Treat pain (**see 7.5**) and fever (**see 7.4**) and avoid constipation.
- **Ciprofloxacin** 500 mg BD oral **for 4 weeks.**
- If the patient cannot take oral medication: ceftriaxone 1 gram OD IV/IM until the patient can tolerate oral medication.

13.2 URINARY STONES

DEFINITION

The formation of stones in the urinary system (in bladder or in kidney), which may 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 (the patient can not lie still).

In patients with repeated urinary infections look for stones

SIGNS AND SYMPTOMS

- Severe acute lumbar or pelvic pain; intermittent **(renal colic: patient can not lie still and has pain that spreads to pubic area**) or constant.
- Blood in the urine (**haematuria**).
- The patient passes **stones in the urine**.
- Signs of secondary infection: fever, chills.

DIAGNOSIS

- Dipstick: blood. If leucocytes and nitrites are present there could be associated infection.
- Urine sediment: look for secondary infection.

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 13.1**)
- Treat the pain according to the severity:

1. Aspirin, ibuprofen, indomethacin or diclophenac PO or IM are alternatives (**see 7.5**)

2. Buscopan (hyoscine butylbromide) IM/IV depending on severity

CHILDREN	> 6 year	0.5 mg/kg
ADULTS		20 mg

Repeat the same dose after 30 min if still pain (max 100 mg daily)

Do not use for children < 6 years and pregnant women

If pain is not relieved:

1. Pentazocine 30 mg/1cc (IM/IV):

CHILDREN	IM	1 mg/kg
	IV	0.5 mg/kg
ADULTS	IM/IV	30-60 mg

- **If pain is not relieved with maximal analgesia, refer to hospital.**
- **If there are signs of urethral obstruction (suprapubic pain and no urine output), refer to hospital.**
- **Consider referral for 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).

REFERENCES Pyelonephritis (**13.1**).

13.3 ACUTE GLOMERULONEPHRITIS

DEFINITION

Acute Glomerulonephritis (AGN) is an inflammation of the filter of the kidneys. There are multiple 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 22.1**) or throat infection (**tonsillitis, see 21.1**). 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.

INVESTIGATIONS

- **Dipstick**: protein (proteinuria), blood (haematuria).
- **Urine sediment**: Red and white blood cells, hyaline, granular and red blood cell casts.

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

TREATMENT

- Admit to IPD, rest.
- Restrict salt intake.
- Restrict fluid intake to 500 ml-1 L/day in adults, 50 ml/kg/ day in children (max 1L).
- Antibiotics like Amoxicillin or Cloxacillin (see tonsillitis and impetigo) are recommended if the infectious focus is still present.
- In case of severe oedema: PO **Furosemide** 1mg/kg/day.
- Treat complications: hypertension (**see 8.1**), acute pulmonary oedema (**see 8.2**), seizures (**see 7.2**).

PREVENTION

Effective treatment of tonsillitis or impetigo (**see21.1 and 22.1**). Prevent other infections that can cause glomerulonephritis. Control blood sugar carefully in diabetes mellitus, and control blood pressure in hypertension.

REFERENCES DM (**10.1**) hypertension (**8.1**), acute pulmonary oedema (**8.2**).

13.4 NEPHROTIC SYNDROME

DEFINITION

In nephrotic syndrome, large amounts of protein are found in the urine (proteinuria) whilst levels of protein in the blood/plasma fall (hypoalbuminemia). 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.

SIGNS AND SYMPTOMS

- Generalised oedema (in severe cases there is pleural oedema)
- Reduced urine output (oliguria)
- Protein in the urine (proteinuria)
- Low albumin level in the blood (hypoalbuminemia)

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:

Sometimes nephrotic syndrome can be cured with prednisolone.
Doses: CHILD PO: 1 mg/kg BID, max 40 mg/day. ADULT PO: 1-1.5 mg/kg OD

After 4 weeks of prednisolone treatment the patient must be reviewed:

Patient is better. Weight is going down	Continue prednisolone	**Adult and Child:** 1.5 mg/kg OD on alternate days x 8 weeks Then reduce by 0.5 mg/kg every 2 weeks and stop
Patient is not better. Weight is not going down	This form is not responding to steroids: stop prednisolone	**Adult and Child:** Reduce by 0.5 mg/kg every 2 weeks and stop Continue with diuretics (see point 2)

2. Diuretics:
Note: Diuretics relieve oedema but do not treat the disorder.
Use a combination therapy of:
Furosemide: ADULT and CHILD PO: 1 mg/kg OD
AND spironolactone: ADULT and CHILD PO: 3 mg/kg OD

Reduce according to clinical response. **Note**: be alert to signs of hypovolemia 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 (**see 12.4**)
- Be sure that your patient has no active TB or amoebic disease (steroids make them worse).

4. Other important management:

- Avoid immobilisation (risk of thrombosis)
- Restrict fluid intake
- Give a high calorie/high protein diet.
- Weigh patient every day. Aim to lose 1 kg/day.
- Keep in IPD until the patient's condition is improving, then discharge with a **weekly follow-up** (check weight and dipstick)
- Total treatment course will be 4-5 months.

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.

PREVENTION

During the oedema the patient has risk of infection: consider **penicillin V** (500 mg PO BD) prophylaxis.

REFERENCES Diabetes Mellitus (**10.1**), worms (**12.4**).

13.5 REPRODUCTIVE TRACT INFECTIONS

SURVEILLANCE
See appendix

General points: Many diseases in this chapter 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. **For all genital infections the patient's sexual partner should also be examined for STI and treated**. 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 15.3**) and offer referral for Voluntary Counselling and Testing (VCT).

Vaginal Discharge Syndrome

Vaginitis and Cervicitis

DEFINITION

Vaginitis is an infection of the vagina. Cervicitis is an infection of the cervix. Both infections are caused by micro-organisms (protozoal, bacterial or fungal). Both conditions have similar signs and symp-

toms. 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

Risk factors associated with cervicitis are:

- Vaginal discharge
- Sexual partner has urethral discharge

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 OF VAGINITIS

The main symptom is abnormal vaginal discharge. 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
a. White, frothy discharge	a. Usually *Trichomonas* (protozoal infection)	a. Metronidazole (PO) 2g stat
b. Grey-green discharge and fishy smell	b. Usually *Gardnerella* (bacterial vaginosis = superficial bacterial infection)	b. Metronidazole (PO) 2g stat
c. White, itchy discharge	c. *Candida* (fungal Infection)	c. Nystatin 100 000 units OD inserted high in vagina for 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 *Gonorrhoea*: **AND** For *Chlamydia*:	Ceftriaxone IM 250 mg stat (or azithromycin PO 1 g STAT) **PLUS** *doxycycline PO 100mg BD/ 200mg OD X 7 day (or azithromycin PO 1 g STAT)

* In pregnancy or allergy: replace doxycycline with azithromycin or erythromycin (PO 500 mg QID x 14 days)

PREVENTION OF SEXUALLY TRANSMITTED INFECTIONS

Educate patients about sexually transmitted infections, promote/provide condom use, single partner.

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 adnex during vaginal examination or tender pelvic mass.
- Microscopy of vaginal/cervical discharge may show gram-negative diplococci or gonorrhoea infection. Chlamydia cannot be identified by field microscopy and should be treated when you treat for gonorrhoea.

TREATMENT

Gonorrhoea, chlamydia and anaerobic bacteria are the most common causes PID. In the OPD management of PID you must treat all three at the same time.

PID combined treatment regime (OPD Management):	**FOR** Gonorrhoea	ceftriaxone IM 250 mg stat
	AND Chlamydia	Plus *doxycycline PO 100mg BID/200 mg OD x 14days (or *tetracycline PO 500mg QID x 14 days)
	AND Anaerobic bacteria	Plus metronidazole PO 500 mg TID x 14 days

***Note**: NOT in pregnancy: In pregnancy replace doxycycline with erythromycin (PO 500 mg QID 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 250 mg OD* **AND**
- **Doxycycline** PO 100 mg BID/ 200 mg OD or Tetracycline PO 500 mg QID **AND**
- **Metronidazole** PO/IV 500 mg TID

Give this regime until patient's conditions improved, then continue only with:

- **Doxycycline** PO 100 mg BID/200mg OD and
- **Metronidazole** PO 500 mg TID for total 14 days

For puerperal sepsis: Consider retained placenta and refer for manual placenta removal. Change antibiotics: ampicillin, gentamicin, metronidazole

Note: If the patient has signs of acute abdominal pain (**see 7.5**) or not better in 3 days of treatment refer them. Before referral give IV fluid and continue antibiotic treatment.

PREVENTION

Educate patients about sexually transmitted diseases, promote/provide condom use, promote single sexual partnerships.

REFERENCES Sepsis (**see 7.6**), acute abdominal pain (**7.5**)

* In our region (South East Asia), resistance of gonorrhoea for ceftriaxone and azithromycin has been reported. If a patient on ceftriaxone or azithromycin does not respond to treatment, show to the doctor as a culture is needed.

Genital ulcers and warts in women

DEFINITION

A genital ulcer is a lesion on the surface of the mucosa or skin in the genital area. A 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 depend 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	Benzathine penicillin IM 2.4 MIU stat[1]	Procain penicillin IM 1.2 MIU OD x 10days *or* *Doxycycline PO 100mg BID /200 mg OD x 14days Ceftriaxone IM 250 mg stat
	AND	Plus Ciprofloxacin PO 500mg BD x 3 days	
	Chancroid	(*or* Erythromycin PO 500mg QID x 7 days *or* Azithromycin PO 1g stat)	

Genital ulcers** (small, painful blisters)	Herpes	Wash with soap and water Apply gentian violet x 5 days Paracetamol 1g QID x 5 days Aciclovir 200mg 5 times/day for 7day	
Genital papule (separate, with dimple in centre)	Molluscum Contagiosum	Wash with soap and water Will disappear in about 8 weeks	
Genital warts (in groups, like cauliflower)	Condyloma Acuminata	Wash with soap and water Paracetamol PO1g QID x 3 days May need surgical removal	

* **Note**: Not in pregnancy: In pregnancy change doxycycline for erythromycin.
1 Because of the volume, this dose of benzathine penicillin is usually given as two injections at separate sites.
** Vaginal herpes may need oral acyclovir to prevent infection of child at birth. Active genital herpes at delivery should have caesarean section. Refer to doctor.

PREVENTION

Educate patients about sexually transmitted diseases, promote/provide condom use, promote single sexual partnerships.
Treat the patient and the partner.

REFERENCES Skin diseases (**22**).

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.

13 GENITO-URETHRAL DISEASES

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
Genital ulcers (open sores) on glans penis	Syphilis **AND** Chancroid	Benzathine penicillin IM 2.4 MIU stat[1] Plus Ciprofloxacin PO 500mg BD x 3 days (or erythromycin PO 500mg QID x 7 days or azithromycin PO 1g stat)	Procain penicillin IM 1.2 MIU OD x10days (*or* doxycycline PO 100mg BID /200 mg OD x 14days) Ceftiaxone IM 250 mg stat
Penile or urethral discharge, pus, urethral irritation burning in passing urine	Gonorrhoea **AND** Chlamydia	Ceftriaxone IM 250 mg stat (or azithromycin PO 1g stat) Plus Doxycycline PO 100mg BID/ 200mg OD x 7days (or azithromycin PO 1 g stat)	Erythromycin PO 500mg QID x 7 days (or tetracycline PO 500mg QID x 7 days)
Inguinal swelling (Lymphogranuloma Venereum) painful bubo	Chlamydia	Doxycycline PO 100mg BID/ 200mg OD x 7days (or azithromycin PO 1 g stat)	
Genital ulcers** (small, painful blisters)	Herpes	Wash with soap and water Apply gentian violet x 5 days Paracetamol 1g QID x 5 days Aciclovir 200mg 5 times/day for 7day	
Genital papule (separate, with dimple in centre)	Molluscum Contagiosum	Wash with soap and water Will disappear in about 8 weeks	
Genital warts (in groups, like cauliflower)	Condyloma Acuminata	Wash with soap and water Paracetamol PO 1g QID x 3 days May need surgical removal	

[1] 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.

REFERENCES Skin diseases (**22**).

14.1 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 (for example, in haemolysis and haemorrhage), and/ or b) decreased red cell production (for example, in nutritional deficiencies and bone marrow depression).

DEFINITION OF ANAEMIA

	Hb (g/dl)	Hct %
Newborn infants	< 14	< 42
Child 1-14 years	< 12	< 36
Adult males	< 13	< 39
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 aid prevention by:

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

COMMON CAUSES

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

ACUTE

- **Malaria** (acute destruction of RBCs) (**see 15.2**)
- Acute bleeding (GI tract, genital tract, artery damage in accident, pregnancy-related haemorrhage e.g. PPH)
- G6PD deficiency.

CHRONIC

- **Nutritional deficiencies** (**see 17.1**)
- (lack of ferrous, folate or vitamin B12 in diet)
- **Hookworm and ascaris infestation** (**see 12.4**)
- **Repeated pregnancies** (mother anaemia)
- **Prolonged breastfeeding without weaning foods** (infant anaemia)
- Peptic ulcer
- Thalassaemia (see below)
- Chronic bleeding, heavy menstruation
- Cancers
- Chronic infections (HIV, TB) (**see 15.3/21.5**)
- Liver and kidney disease
- Tropical splenomegaly
- Aplastic anaemia.

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

SIGNS AND SYMPTOMS

Anaemia affects all population groups. However, the most susceptible groups are pregnant women and young children. The signs and symptoms depend on the severity of anaemia and if 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 (chronic hookworm infection, repeated malaria attacks) or they have had a low haemoglobin count since birth (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 (example is acute bleeding, severe malaria)

- Fatigue, tiredness
- Difficulty breathing **at rest**
- Palpitations **at rest**
- Pallor (conjunctivae, palm of hands, nail beds)
- **Fast heart rate at rest** (adult >120/m)
- **Fast respiratory rate at rest** (adult >40/m)
- **Low BP** (systolic <100 mmHG e.g post-partum haemorrhage)
- 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

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). Iron should be continued for 3-6 months after the Hb level has returned to normal to replenish iron store. Administration of **vitamin C** may aid the body's ability to absorb iron.
- If HB< 6 /Hct < 18, discuss with doctor about transfusion.
- For acute symptomatic anaemia: stop the bleeding and transfuse urgently.
- 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 8.2**).
- All patients with anaemia should be dewormed (**see 12.4**).

TREATMENT DOSE

Ferrous sulphate	Adult:		200 mg TID	**Folic acid**	Adult:	5 mg OD
	Child:	< 5 kg	50 mg BD		Child:	2.5 mg OD
		> 5kg	100 mg -200 mg BD			

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

PROPHYLACTIC DOSE

Ferrous sulphate	Adult:		200 mg OD	**Folic Acid**	Adult:	5 mg/week
	Child:	< 5 kg	50 mg OD		Child:	2.5 mg/week
		> 5kg	100 mg – 200 mg OD			

One tablet (200 mg) of ferrous sulphate contains 65mg of iron.
Treatment dose is 3-6 mg/kg iron daily for children (max 200mg iron = 3 tablets of ferrous sulphate/day).
Prophylactic dose of iron for children is 1-2 mg/kg/day (max 15 mg).

TREAT THE CAUSE

1. Malaria

- Give appropriate anti-malaria drugs according to protocol (**see 15.2**).
- Give FS and FA when fever is down or when the malaria smear is negative.
- Refer to IPD if there are signs of acute anaemia / anaemic heart failure, and if severe or hyper PF malaria.

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

- If patient has severe or hyperparasitaemic malaria, transfuse if Hb < 7 – Hct < 20 (the malaria parasite will still destroy more RBC).

2. Severe bleeding with signs of shock

- Try to stop the bleeding (compression of artery, transfer to maternity facilities if miscarriage/abortion).
- Insert two large cannulas (16 gauge) in two large veins: give fast Ringer or NSS until systolic BP > 90 mmHg.
- Transfer to hospital if possible (if serious gastrointestinal bleeding).
- Urgent cross match if available and transfusion – do not delay transfer by waiting for blood.

- Give ferrous sulphate and folic acid treatment dose after transfusion.

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

- De-worm (**see 12.4**)
- Give ferrous sulphate and folic acid treatment dose.

4. Poor nutrition, pregnancy and breastfeeding

- Give nutrition advice
- Give ferrous sulphate and folic acid 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.

5. Other causes: e.g. a patient remains anaemic despite treatment:

- Compliance for some people is difficult. They remain anaemic because they cannot tolerate the side-effects of oral ferrous sulphate which includes vomiting, epigastric pain or diarrhoea. Discuss with the doctor about alternatives in these patients.
- Vitamin B12 deficiency can cause anaemia. Check the patient's alcohol intake. 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** (1 mg) 3 x per week for 2 weeks. After these two weeks give injection once a month for 3 months in addition to **B complex** 2 tablets BID (or vitamin B12 tablets) and folate supplementation.
- Haemolytic anaemia is caused by haemolysis (destruction or breaking of red blood cells). Two genetic causes of haemolysis found in this area are Thalassaemia and G6PD deficiency.

➔ 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 iron and folic acid to all pregnant women in prophylaxis doses and provide advice on nutrition. Prevent (malaria) infections and treat early. Deworm all pregnant women (after the 1st trimester) and children of school-going age.

REFERENCES Malaria (**15.2**), Worms (**12.4**), Malnutrition (**17.1**)

14.2 THALASSAEMIA

DEFINITION

Thalassaemia is a genetic disease caused by abnormal or decreased haemoglobin production. Located in the red blood cells, haemoglobin is made up of two alpha (α) and two beta (β) chains. Thalassaemia results in decreased or absent haemoglobin chains: In α thalassaemia the α chains are affected and in β thalassaemia the β 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/ Burma border α- /or β- thalassaemia occur in approximately 10% of people.

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

SYMPTOMS Mild, well-tolerated anaemia, often noticed in pregnancy
INVESTIGATIONS CBC, Thalassaemia test
TREATMENT 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.

SYMPTOMS Well-tolerated anaemia that gets worse with age. Splenomegaly
INVESTIGATIONS CBC, Thalassaemia test.
TREATMENT Check Hb regularly.
Folic acid and vitamin B complex (or vitamin B12 tablets).
Give blood only at times of severe anaemia.
Splenectomy can sometimes help.

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

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

SYMPTOMS 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).

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.
With not enough transfusion	Anaemia with reduced growth, slow development and bone deformity. Enlarged spleen (splenomegaly). Intermittent fever. Bleeding. Death usually occurs at 20-30 years of age from cardiac iron overload.

INVESTIGATIONS CBC, film (target cells), thalassaemia test.

TREATMENT

- Consider regular transfusions to keep Hb > 8, Hct > 24.
- Patients receiving multiple transfusions should be transfused in the hospital.
- Transfusion is the only effective treatment, but over time this causes iron overload and damages some organs, causing death (give desferrioxamine 1-2 gram at each blood transfusion, which can help reduce iron overload).
- Folic acid 10 mg OD, vitamin C.

- If splenomegaly is present, discuss the possibility of splenectomy (note: the benefit is only temporary).

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

14.6 G6PD DEFICIENCY

(= GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY)

DEFINITION

This disease is caused by a deficiency of the protein G6PD in the red blood cells. It is a genetic disease, is present from birth and is more common in men. People with this disease usually have no symptoms, although some have chronic anaemia.

Note: Some patients suffer from acute haemolytic anaemia (destruction of red blood cells) if they contract 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.

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.

TREATMENT

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

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

➔ If you 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 OPD/IPD immediately.

DRUGS WITH POSSIBLE RISK IN G6PD SUBJECTS

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

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 that future health workers are aware of the problem

REFERENCES Anaemia (**14.1**).

14.4 TRANSFUSION

INDICATIONS FOR TRANSFUSION

Policy regarding transfusion differs among NGOs working along the border. Below are only basic guidelines. Transfusion is only possible where blood can be tested for group and screened for malaria, hepatitis B and HIV. Testing for hepatitis C and syphilis is also recommended.

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.**

Transfuse urgently when:	Do NOT transfuse when:
• Signs of severe acute symptomatic anaemia or anaemic heart failure *and/ or* • Acute severe bleeding *and/ or* • Severe or hyperparasitaemic malaria and Hb<7-Hct<20	• Signs of moderate chronic anaemia (**see 14.1**)
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 decompensation. 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

- **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 result.**

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 cannulae, the slower the blood flow.
3. Give an infusion of normal saline 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	
O	O	Group O = Universal donor
A	A, O	
B	B, O	
AB	AB, A, B, O	Group AB = Universal acceptor

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 & /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)

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).

For cross matching the blood: put one drop of the patients and one drop of the donor's blood on a glass and mix.
If there is clotting do not take blood from this donor for the patient.

GIVE THE BLOOD TRANSFUSION TO THE PATIENT:

1. CALCULATE THE AMOUNT OF BLOOD TO GIVE (1 BAG = 350-450 cc)

child < 1 year	15 cc / kg
child > 1 year	20 cc / kg
severely malnourished child	10 cc / kg
adult	1-2 bags

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>90mm Hg): give it **over 10 minutes**.
- For patients **at risk of cardiac failure** (Severely malnourished children, old people, people with heart / kidney problems, patients with chronic anaemia) give it **over 4 hours** and give **furosemide** PO/IV half way (Child 1mg/kg, Adult 20 mg).

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 NORMAL SALINE.

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. IN CASES OF ACUTE BLEEDING, ALSO GIVE THE PLASMA PART OF THE BLOOD.

RISKS DURING BLOOD TRANSFUSION

Observe carefully the patient carefully during the blood transfusion. Check vital signs regularly.
It is important to recognise the symptoms of reaction to blood transfusion so you can stop the transfusion and prevent serious complications.

FOR SUSPECTED TRANSFUSION REACTION

- Stop the transfusion and disconnect the set from the needle / cannula.
- Using a new infusion set, keep the line open with fluids.
- 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
What to do: give ringer / normal saline fast if patient is going into shock (**see shock 7.6**).

2. PULMONARY OEDEMA

Patients at risk: children < 1 year, severely malnourished children, 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.
What to do:

- put the patient in sitting position.
- give oxygen if available.
- give **Furosemide** IV.

children	1 mg/kg	Repeat the dose every ½ hour if no improvement.
adults	40 mg = 4cc	

3. ALLERGIC REACTIONS

(a) Skin reactions

Symptoms: urticaria, big red itching lesions.

What to do:

- give **Chlorpheniramine** PO (child 1-2 mg, adult 4 mg).
- 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)

Symptoms:

oedema, difficult breathing, wheezing, high BP, then low BP, sometimes diarrhoea and vomiting.

What to do:

- Give **adrenaline** 1:1000 IM (**see Anaphylactic shock, 7.6**).
- Give **Normal saline / ringer IV** fast.
- Give **dexamethasone** IM/IV (**see Anaphylactic shock, 7.6**).
- Give **oxygen** if available.

15 INFECTIOUS DISEASES

15.1 BACTERIAL DISEASES

Bacterial meningitis

Meningococcal Meningitis
URGENT REPORT
SEE APPENDIX

DEFINITION

Bacterial meningitis is a bacterial infection (mostly Streptococcus pneumoniae, Neisseria meningitides or Haemophilus influenzae) of the membranes covering the brain (meninges). The bacteria are transmitted from person to person through droplets or throat secretions. For other causes of meningitis see e.g. viral meningo-encephalitis (**15.3**), TB-meningitis (**21.5**), Cryptococcal Meningitis (**15.3**).

SIGNS AND SYMPTOMS

Children < 1 year

- Fever (38.5 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 rash (purpura).

Older children and adults

- Fever (38.5 or more), headache, vomiting
- Light hurts the eyes (photophobia)
- Neck stiffness
- Positive signs of meningism (Kernig's and/or Brudzinksi sign positive)
- Convulsions and coma
- Sepsis: haemorrhagic rash (purpura).

Always think of meningitis in febrile patients with severe headache or coma: **Check neck stiffness**

Neck stiffness: move the chin towards the chest; this results in pain and resistance in a patient with meningism.
Kernig's sign: flex the hip and straighten the leg: this results in pain and resistance in a patient with meningism.
Brudzinski sign: bend head forward and you see hips flex.

DIAGNOSIS

Clinical presentation and lumbar puncture (If possible in your situation).

- Always carry out a malaria smear. Malaria and meningitis can occur together.
- Lumbar puncture: check the appearance of the spinal fluid, WBC, glucose, total protein and microscopy (gram stain, Ziehl Neelsen stain, India ink stain).

Cause	Normal CSF	Bacterial	Viral	TB	Cryptococ
Appearance	Clear	Cloudy	Clear	Slightly cloudy	Slightly cloudy
WBC	<5/mm3	>200/mm3	>10mm3	>10/mm3	>10/mm3
Glucose	mmol/L	Low	Normal	Low	Low
Total protein	0.15-0.4 g/L	High	High	High	High
Microscopy	None	Pus	None	AFB in ZN stain	Pos in India Ink

Do NOT perform a lumbar puncture if there are signs of raised intracranial pressure such as unequal pupil size, non-reactive pupils, a very slow heart rate (<50 in adults) or irregular breathing. If you cannot perform a lumbar puncture but you are concerned about meningitis start antibiotics.

Do not delay starting antibiotics waiting to do a lumbar puncture.
This could lead to the death of the patient.
If lumbar puncture cannot be done on admission: start antibiotics

TREATMENT

- Admit to IPD.
- Give Antibiotics:

First choice

For all >2 months:	**Ceftriaxone**	IV/IM 50 mg/kg/day BD or 100 mg/kg/day OD for 10 days
	(e.g. Child 50 mg/kg BD, Adult 2g BID)	
Children < 2 months:	**Ampicillin**	IV/IM 50 mg/kg QID AND
	Cefotaxime	IV/IM 50 mg/kg BID – QID AND
	Gentamicin	IV/IM 4 mg/kg OD
	14-21 days (gentamicin could stop after 7 days)	

Alternative treatment, when no ceftriaxone available:

Children > 2 months and Adults:	**Chloramphenicol**	IV/IM 25 mg/kg QID
	When the patient's condition has improved and fever is down: change to oral and half the dose (12.5 mg/kg QID) for a total of 10 days.	
Pregnant Women:	Ampicillin	IV 2 g QID for 10 days

- **Dexamethasone** IV 0.15 mg/kg QID for 4 days (first dose before or together with first antibiotics dose) improves the outcome in adults and children.
- Give supportive treatment: fluids and oxygen.
- Treat the fever with **paracetamol.**
- Treat the convulsions with **diazepam** (0.5 mg/kg rectally, max 10mg) or 0.3 mg/kg IM (**see 7.2**).
- Give special nursing care if the patient is in a coma (**see Coma section 7.1**).

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** 15 mg/kg STAT orally in children, 500 mg STAT orally in adults).

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.

Note:

- ➔ In **TB meningitis** the fever is not very high, and can be sporadic. Suspect TB meningitis in young patients with neurological signs (hemiplegia, paraplegia). Usually these have a gradual onset. Often the patient will show changes in their behaviour.
- ➔ **Cryptococcal meningitis** is more common in patients with depressed immunity and is also of slow onset. Temperature can be normal or only slightly elevated, and there is severe persistent headache (see treatment in HIV/AIDS section, **15.3**).

Leptospirosis

SURVEILLANCE
See appendix

REFERENCES

Cerebral malaria (**15.2**), Encephalitis (**15.3**) TB-meningitis (**21.5**), Cryptococcal meningitis (**15.3**), Leptospirosis (**15.1**).Leptospirosis

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.

At risk of infections are farmers and miners; people walking without shoes in rivers, sewage and canals; people swimming in rivers and lakes; people working in abattoirs

SIGNS AND SYMPTOMS

- Sudden high fever with chills and rigors.
- Conjunctival suffusion (eyes are pink, no pus).
- Severe muscle pain (particularly calves) and tenderness.
- Headache.

Sometimes also: abdominal pain, nausea and vomiting, diarrhoea, cough and pharyngitis, chest pain, arthralgy (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:

- **Meningitis:** with severe bitemporal and frontal headache.
- **Liver and Kidney failure (Weil's disease):** high fever over 40C, jaundice, oliguria/ anuria, (accompanied by: haemorrhagic pneumonia, cardiac arrhythmias and circulatory collapse). In some patients you will find a enlarged liver and spleen (hepato-splenomegaly).

- **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).
- Uveitis.
- Liver failure usually gets better, but kidney failure and respiratory distress syndrome have poor prognosis.

DIAGNOSIS

Clinical, but some investigations could be helpful:

- Dipstick: proteins and blood in urine.
- Lab (if available): raised CK and bilirubin.
- Definite diagnosis by special blood test (serology), but it is not available in all clinics and not easy to interpret.

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.

(a) Mild infections

- PO **doxycycline** 200 mg OD x 7 days.
- In children and pregnant women:
  PO **amoxicillin** (child: 10-25 mg/kg TID, adult 500 mg TID) x 7 days

(b) Severe infections

- IV **ampicillin** (child 10-25 mg/kg TID, adult 500-1g QID) x 7 days or
- **Ceftriaxone** IV (25-50 mg/kg OD, adult 1-2 gram OD) * 7 days

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. The vaccine for humans is of limited benefit and is not used in our region.

REFERENCES

Malaria (**15.2**), meningitis (**15.1**), typhoid fever (**15.1**), scrub typhus (**15.1**), hepatitis (**12.3**).

Scrub typhus

SURVEILLANCE
See appendix

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 carrier. Scrub typhus is common our region. **Scrub typhus is one of the most common causes of 'Fever of Unknown Origin' (FUO) 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 papulae becoming bigger with a dead (necrotic) centre, covered by a black hard surface (**eschar**). Look for it 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.

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.

On the Thailand/ Burma 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.

TREATMENT

- Treat the fever and the pain.
- Antibiotic.

(a) First choice:		
Doxycycline	Child**	4.5mg/kg OD for 7 days
	Adult	200 mg PO for 7 days
(b) Second choice		
Chloramphenicol	500 mg PO QID for 7 days.	

** **Note**: The benefit of short courses of doxycycline outweighs the risks of no treatment in children and pregnant women, when the suspicion of scrub typhus is strong. If available, they can be treated with **azithromycin** 500 mg on day 1 and 250 mg from day 2-5. (Dose for children 10 mg/kg OD for 3 days). Azithromycin is very safe in pregnancy.

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 delousing) 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 (200 mg 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.

REFERENCES Dengue (**15.3**), Leptospirosis (**15.1**) Typhoid fever (**15.1**).

Tetanus

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 (See appendix).

SIGNS AND SYMPTOMS

- 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

All wounds should be cleaned. Necrotic tissue and foreign material should be removed (**see 22.4**).
If tetanic spasms are occurring, supportive therapy and maintenance of an open airway are very important.

PREVENTION & VACCINATION (see wounds 22.4)

RISK	PATIENT VACCINATION COMPLETE Last booster was:			PATIENT VACCINATION NOT COMPLETE (< 3 doses)
	< 5 years	**> 5 years**	**> 10 years**	
LOW *	None	None	Booster	Start or complete vaccination (full course of 5 doses)
HIGH **	Antibiotics	Antibiotics Booster	Antibiotics Serotherapy Booster	Antibiotics Serotherapy Start or complete vaccination

* Low risk wound: minor wounds, scratch.
** High risk wound: deep wounds, war wounds, wounds with bone fractures, wounds with devitalised tissue, extensive burns, foreign bodies, wounds older than 6 hours.

Antibiotics:	**Cloxacillin** for 5 days (treatment doses: see appendix)
Booster:	**Tetanus toxoid vaccine** 0.5 ml by IM into upper arm or buttock
Serotherapy:	Adults: 250 units **Tetanus Immune Globulin (TIG)** 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 500 units of TIG. Children of any age: 250 Units of **Tetanus Immune Globulin** IM STAT.

REFERENCES Wounds (22.4)

Typhoid fever

SURVEILLANCE
See appendix

DEFINITION

Typhoid fever is a bacterial infection caused by Salmonella typhi. It is transmitted by contaminated food, water or dirty hands. The incubation period is 10 -15 days.

SIGNS AND SYMPTOMS

Typhoid is suspected in a patient with:

- Prolonged fever >=38.5° C (axillary) 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 (spots on the abdomen and the chest).
- 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.

TREATMENT
- Admit to IPD: give fluids: ORS or IV fluids (NSS or RL)
- Treat the fever with paracetamol.
- Antibiotics:

1st choice:		
Ciprofloxacin:	**Child**	**7.5 mg/kg BID for 5-7 days**
	Adult < 40 kg	250 mg BID for 5-7 days
	Adult > 40 kg	500 mg BID for 5-7days
For severe cases/ those who cannot swallow:		
Ceftriaxone	IV/IM 50mg/kg OD for 7 days	

Note: Resistance of Salmonella typhi to ciprofloxacin has been described in our area. In case of suspected resistance (bad response to cipro treatment) continue treatment for 10-14 days or switch to azithromycin or ceftriaxone).

- If signs of peritonitis: REFER (**see 7.5**).
- For severe presentations (shock, coma): **dexamethasone** 3 mg/kg IV in 30 minutes, then 1 mg/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.

REFERENCES
Malaria (**15.2**), Liver abscess (**12.3**), Scrub Typhus (**15.1**), Leptospirosis (**15.1**), Tuberculosis (**21.5**).

15.2 PARASITIC DISEASES

Lymphatic filariasis

SURVEILLANCE
See appendix

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/ Burma border are Wucheria bancrofti and Brugia malayi.

SIGNS AND SYMPTOMS

- Might be asymptomatic (no signs or symptoms).
- Fever with headache, lymphadenopathy, itchy skin (dermatitis), sometimes bacterial super infection.
- Swollen lymph nodes mainly in the groin.
- Arm, breast, leg or scrotal swelling due to lack of lymph drainage.

Chronic infections lead to:

- Lymph oedema of the legs.
- Ascites.
- Glomerulonephritis with haematuria.
- Chyluria (passing white urine: urine mixed with chyle (lymph fluid) of ruptured lymph vessels).

Complications: due to extreme eosinophilia, severe pulmonary inflammation can develop: tropical pulmonal eosinophilia (**see 21.2**). Patients present with dry cough (especially at night time), wheeze, dyspnoea, fever and sometimes coughing blood.

DIAGNOSIS

- Blood smear, preferably at night, to see microfilariae in the blood.
- Lymph node biopsy in lymphatic filariasis or specific antibody test.
- Urine examination for proteins.

TREATMENT

- **Albendazole** PO 400 mg STAT *
  AND
- **Doxycycline** 200 mg OD for 6 weeks **
  or
- **Diethylcarbamazine (DEC)** 1mg/kg on the first day, then increase gradually to 2 mg/kg in TID (day 4-21). This dose is maintained for 21 days (be careful for side effects: fever, headache, myalgia, anorexia, abdominal discomfort). DEC is effective against microfilariae and adult worms of Wucherieria bancrofti and Brugia malayi. A single dose kills only 50% of adult worms.

  ***Note**: Do not use albendazole in first trimester of pregnancy ** Note: Do not use doxycycline in pregnancy.

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 22.4**).

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.

REFERENCES Wound care (**22.4**)

Malaria

SURVEILLANCE
See appendix

See the SMRU Handout for more details

DEFINITION

Malaria is a parasitic infection that is transmitted to humans by the female Anopheles mosquito. Four plasmodial species are found on the Thailand/ Burma border: P. falciparum (PF), P. vivax (PV), P. malariae (PM), P. ovale (PO) – this is rare. Plasmodium falciparum is the cause of nearly all the deaths caused by malaria. In our area, P. falciparum is highly resistant to antimalarial drugs.

SIGNS AND SYMPTOMS

- Fever with one or more of the following signs: headache, chills, rigor, sweating, muscle or joint pain, anorexia (poor appetite), nausea, vomiting, abdominal pain, diarrhoea.
- Sometimes, the patient arrives unconscious or with convulsions.
- Sometimes, the patient has no fever at the time of consultation.
- Anaemia and enlarged spleen are common.

Always think of malaria in patients with fever

DIAGNOSIS

Confirm the diagnosis with a positive blood test (Malaria Smear-MS) or with a rapid test.

- The malaria smear is positive if there are trophozoites (T).
- Results may be mixed (PF + PV).
- With gametocytes only (PG), the patient carries the parasite, but is not sick and does not need treatment. **Treat gametocytes-only (PG) if patients have clinical signs of malaria and have not received a full course of an effective treatment (MAS3, AS7D7, Q7D7).**

Note:

➔ Always take a blood smear before starting any malaria treatment, even if it is not possible to read it (for example, at night or in emergency). It will be read later to confirm or exclude the diagnosis. **DO NOT DELAY** treatment waiting for a slide to be read the next day.

➔ If the smear is negative and fever persists, repeat the smear.

Remember: the diagnosis of malaria is by blood test, but the diagnosis of severity is CLINICAL:
Look at the smear result to decide: (hyper) malaria or not
Look at the patient to decide: severe or not

PREVENTION

A mosquito that bites during the evening (Anopheles) transmits this disease. Individual protection against Anopheles mosquitoes are: (long-lasting impregnated) bed nets, long sleeves and trousers in the evening, insect repellents, burning mosquito coils. Chemoprophylaxis is not recommended in this area. Malaria control programmes include patient education, early detection and diagnosis (especially for the high risk groups: pregnant women and children), anti-mosquito spraying (vector control), use of impregnated bed nets.

VACCINE

At this moment there is no malaria vaccine available.

REFERENCES Meningitis (**15.1**), Typhoid fever (**15.1**), Dengue (**15.3**), Coma (**7.1**), Convulsions (**7.2**), Anaemia (**14.1**)

DIAGNOSIS OF SEVERITY: IS THE MALARIA SEVERE?

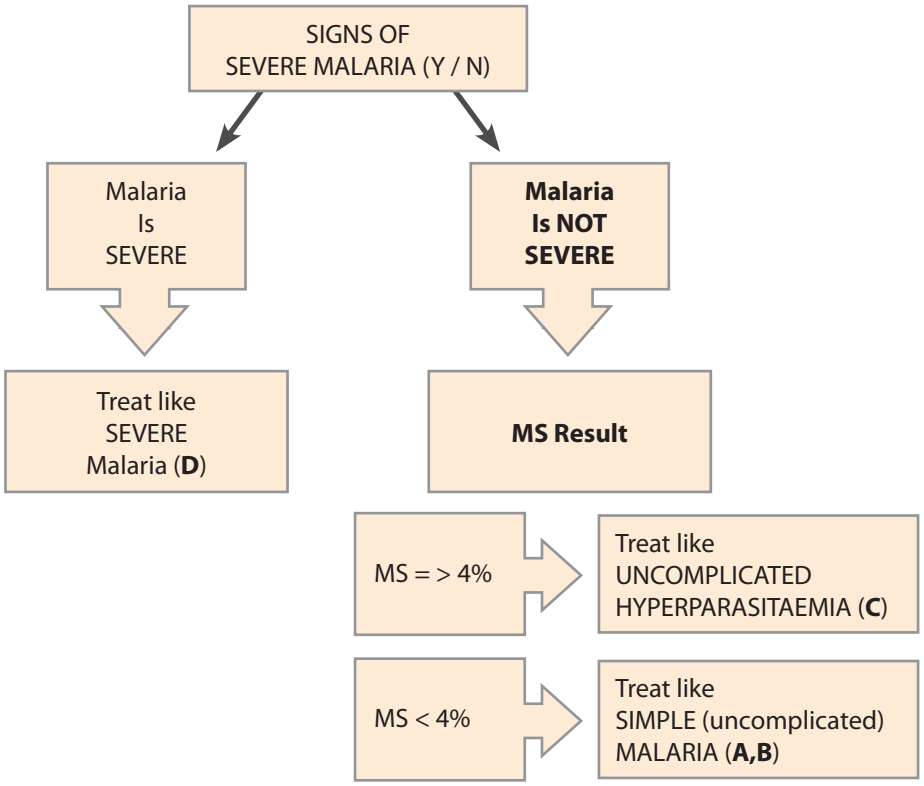
Once you have diagnosed malaria with a positive blood test, decide whether or not the malaria is severe before starting treatment. Check all women of reproductive age (15-50) for pregnancy.

Defining criteria of severe malaria:	
• Cerebral malaria	The patient is unconscious.
• Severe anaemia	Hb<=6g/dl (Hct <18%) or signs of severe anaemia.
• Renal failure	No or little urine (<400 cc/day).
• Pulmonary oedema	Rapid breathing with crackles at both lung bases.
• Hypoglycaemia	Pale, sweating, falling unconscious, Dextro <2.5 mMol (<45 mg/dL).
• Shock	Pulse >130 and BP <80/50 with cold hands and feet.
• Spontaneous bleeding	Bleeding from gums or in urine, vomiting blood, petechial rash with small very dark spots.
• Neurological signs	The patient is drowsy, irritable and agitated, and had/has convulsions.
• Acidosis	The patient is breathing very deeply.
• Haemoglobinuria	Passage of dark red to black urine.

Note: One sign positive = severe malaria, but many patients have 2 or 3 signs at the same time.

Other manifestations of severe malaria:

- Extreme weakness and cannot eat or drink by him/her self.
- Hyperparasitaemia (>4% RBC infected).
- Hyperthermia - Temperature >40.5C.
- Jaundice.
- Severe vomiting.



TREATMENT

A. Simple Plasmodium vivax (PV), Plasmodium ovale (PO) or Plasmodium malariae (PM) MALARIA

Malaria smear: PVT, PMT, PVGT or PMGT (Not PF).

- Treat the fever with paracetamol.
- Treat the malaria. See **Treatment Table - Line 1**.
- Carefully check patients who may be at risk (pregnant women and children <2 years) and decide if admission to IPD is necessary.

More than half of all patients with PV or PO will relapse after treatment with chloroquine alone.
Relapse is due to the presence of resting stage hypnozoites in the liver. The only drug that can kill the liver stages and prevent relapses is primaquine.

Primaquine can cause haemolysis in G6PD-deficient patients. Patients tested with normal G6PD can be safely treated with **primaquine** 15mg OD for 14 days. When G6PD is deficient primaquine given weekly for 6 or 8 weeks is effective and safe. When G6PD testing is not available, patients with PV or PO can be safely treated with once weekly primaquine.

Primaquine dose:	Adult	15mg (base) PO OD x 14 days. (contraindicated in pregnancy).
	Child	0.25 – 0.5 mg/kg PO OD x 14 days.
or (in G6PD-deficiency or no G6PD test available):		
	Adult	45 mg once weekly x 6 weeks / 30 mg once weekly x 8 weeks
	Child	0.75 mg/kg once weekly x 8 weeks

SMRU advice is to treat only frequent relapses, and recommends daily supervision of treatment in case of possible side effects. Thai Clinics treat all PV cases with a 14-day course of primaquine. Primaquine tablets should be taken with food to reduce to gastro-intestinal side effects. The recommended primaquine dose in some clinics in South East Asia is higher than the dose elsewhere in the world because of resistance. Discuss with the doctor which dose you should use in your clinic. (Maximum adult dose 30 mg PO OD for 14 days)

Note: When a patient has signs of severity with PV treat him/her as having severe malaria (like severe PF: see treatment D).

MIXED (PF+PV) MALARIA in NON PREGNANT PATIENTS

Malaria smear: PFT, PFGT, PVT+PFT.

For any MS mixed result, PFT is the most dangerous so treat as PF malaria.

The choice of treatment is artesunate-mefloquine (**MAS3**), but these drugs have contraindications (see below).

Before treating and during treatment check for the following:

a) Is the malaria severe?
b) Is the patient pregnant? If there is any doubt, do a pregnancy test.
c) Has the person received Mefloquine (MFQ) in the last 2 months?
d) What is the age and weight of the person?
e) Check the parasitaemia (hyper: ≥ 4% non hyper: <4%).
f) Make sure the patient eats and drinks during treatment.

Note: Do not forget to treat the fever, hypoglycaemia, vomiting, dehydration or other symptoms.

B. SIMPLE (UNCOMPLICATED) PF MALARIA:	– **No signs of severity** – **MS = PFT < 4%** – **Patient not pregnant**

- **OPD supervised treatment** – see **Treatment Table - lines 2,3,4**
- If possible, **admit to IPD** children < 2 years old. They can develop severe malaria very rapidly. If not possible, ask the family to watch them closely for the first 24 hours.

C. UNCOMPLICATED PF HYPERPARASITAEMIA:	– **No signs of severity** – **MS = PFT ≥ 4%** – **Patient not pregnant**

- **Admit to IPD**, close monitoring, ensure eating and drinking.
- Use the same checklist as for uncomplicated malaria.
- Treat the malaria: see **Treatment Table - lines 5 and 6.**

- If patient deteriorates, treat as severe malaria.
- Anaemia risk is high, especially in children. Check Hb on admission, at 24 hours, and before discharge.

D. SEVERE AND CEREBRAL MALARIA

- **Admit to IPD.**
- Treat the malaria: **see Treatment Table - line 7.**
- **Monitor the patient closely and check:**
  - **Temperature, RR, pulse, BP** and **consciousness** (coma score) every hour during the first 4 hours and then every 2 to 4 hours afterwards.
  - **Glucose Level** with dextrostick before and at the end of the loading dose for quinine, and if the patients gets worse. Pregnant women and children should have dextrostick QID while on IV quinine.
  - **Hb** when admitted and every day if Hb is <7.3 (Hct <22) or if severe signs of anaemia appear.
  - Quantity of **urine** if the patient says there is little or if unconscious (catheterise and monitor the urine output).
  - **MS** daily.
- **Treat the complications:**

Common Complications:	
Fever:	Treat with paracetamol or ASA and sponging (**see 7.4**). (ASA contraindicated in children and patients with low platelets).
Coma:	Manage in case of cerebral malaria (**see coma section 7.1**).
Convulsions:	Treatment: give **diazepam** IV/IM/PR if convulsions start (**see 7.2**).
Hypoglycaemia:	Treat when dextro is < 2.5 mMol (<45 mg/dL) with **D50** IV 1 ml/kg (**see 10.1**).
Severe Anaemia:	Give transfusion if needed (see anaemia and transfusion sections on **14.3**).
Pulmonary Oedema:	Sitting position, decrease infusion, and give furosemide (**see 8.2**).
No Urine:	If the patient is dehydrated, give Ringers/NSS. If unconscious, put in a urinary catheter.
Infection:	A patient with severe malaria can easily develop other severe infections. If there is any doubt about prolonged fever and coma while you give antimalarial treatment, give IV ceftriaxone or ampicillin and gentamicin.
Shock:	Give NSS or RL quickly until the systolic BP is > 90mmHg. (see page 28). In case of signs of septic shock add IV ceftriaxone or ampicillin and gentamicin to your antimalarial treatment.

- **Stop IV / IM treatment and start oral treatment as soon as they can be tolerated:**
  See **Treatment table - line 7**

E. PRESUMPTIVE MALARIA

When clear clinical signs of malaria are present, but the smear is not available (no lab) or negative after the patient has taken some malaria medicines at home, it is presumptive malaria.

- Repeat the smear if there is a strong suspicion, but the smear was negative.
- Check for signs of severity and treat as:

Simple presumptive malaria. See **Treatment Table - line 8**

Severe presumptive malaria.
- Admit to IPD
- Treat like severe malaria: See **Treatment Table - line 7**

F. MALARIA IN PREGNANCY

- If possible, **admit to IPD all pregnant women,** because they can develop severe malaria very rapidly.
- For treatment see **Treatment Table - lines 9,10,11,12,13**.

CONTRAINDICATIONS TO MALARIA TREATMENT

Can not give:

MEFLOQUINE:	Allergy, pregnancy, child less than 5 kg, mefloquine given in the past 63 days, history of epilepsy or mental illness, fitting, drowsiness, unconsciousness, deep jaundice.
DOXYCYCLINE:	Allergy, pregnancy, children less than 8 years old.
ARTESUNATE:	Allergy.
PRIMAQUINE:	Allergy, pregnancy.
DAILY PRIMAQUINE:	G6PD-deficiency (Can give weekly primaquine).

SOME NOTES ON TREATMENT

1. Malaria on this border is resistant to most anti-malarial drugs. If the remaining drugs are not used carefully, soon there will be no drug to treat malaria.
2. Good or adequate treatment means making sure that every patient gets the correct dose and takes the full treatment.
3. Sometimes treatment can be difficult to give due to **vomiting** (especially MFQ).
   - Reduce fever by sponging and give paracetemol or ASA before giving anti-malaria tablets.
   - If the patient vomits **less than 30 minutes after tablets**, give metoclopramide IM and after 10 minutes **repeat full dose**.
   - If the patient vomits **between 30 minutes and 1 hour** after tablets, give metoclopramide IM and after 10 minutes **repeat half dose**.
   - If the patient **vomits again**, less than 1 hour after the second dose, even if he has no more fever and after metoclopramide, **treat like severe malaria**.
   - If the patient vomits more than 1 hour after taking MFQ, do not repeat the dose.
   - If the patient vomits so much that he can not take oral treatment even after metoclopramide: admit to IPD and use IV/IM quinine/artesunate/artemether until the patient stops vomiting.
4. Signs of severity after starting oral treatment:
   - Change treatment to that for severe malaria (quinine or artemisinin).
   - If the patient had more than 2 doses of quinine in the last 24 hours, do not give loading dose.
5. Antibiotic associated colitis is the most toxic side effect of clindamycin and can be fatal. Explain to all patients the risk of developing diarrhoea before giving the drug. If diarrhoea develops stop clindamycin immediately. Treat the diarrhoea according to the severity (rehydration). Severe cases will need IV fluids and metronidazole.

Note:
Patients who are hyposplenic (spleen not working properly) or without a spleen (splenectomised) clear the parasite more slowly so may have a positive smear for much longer even after successful treatment.

SPECIAL SITUATIONS

- **Allergy to quinine or chloroquine:**
  Use artemisinin derivative if available. Otherwise, give dexamethasone, wait 10 minutes then give antimalarial and watch carefully. If allergic symptoms appear (urticaria raised itching rash, sudden oedema of the face; difficulties breathing), give more dexamethasone, control blood pressure and oxygenation (refer to section on anaphylactic shock, **7.6**).
- **Allergy to artesunate:**
  Use Quinine in combination with tetracycline, doxycycline or clindamycin.
- **Very small babies:**
  If it is difficult to put in an IV line or to give small quantities of infusion at precise times, you can give IM quinine or artemether. (See appendix for preparation of IM quinine.)

Patients with mild allergy can often tolerate a course of antimalarials with chlorpheniramine cover. If you plan to do this, the patient should be admitted to IPD in case of worse allergy or no allergy at all. If a patient says he/she is severely allergic to the drug it should not be given.
Treatment of allergy to antimalarials: see mild allergy and anaphylaxis (**see 7.6**)

MALARIA TREATMENT TABLE

		Adult (non pregnant)	Children < 8 years
A. SIMPLE PV, PM, PO			
1		**CQ3** **Frequent relapses: consider primaquine**	
B. SIMPLE (uncomplicated) PF or MIXED: No Hyperparasitaemia, No severity			
2	No MFQ last 2 months	**MAS3**	**MAS3**
3	MFQ or MAS3 <2 months	**AS7D7**	**AS7**
4	AS7D7 or AS7 <42 days	**AS7D7**	**AS7**
C. UNCOMPLICATED HYPERPARASITAEMIA (MS >4%)			
5	No MFQ in last 2 months	**MAS7**	**MAS7**
6	MFQ or MAS3 in < 2 months	**Hyper AS7D7**	**Hyper AS7**
D. SEVERE PF or PV and SEVERE PRESUMPTIVE			
7	Unconscious - Drowsy/confused, Convulsions, Renal failure, Severe anaemia Hb < 6, Shock, Hypoglycaemia, Pulmonary oedema,, Bleeding, Haematuria, Acidosis	**AS IV** followed by **AS and D7** or **AM IM** followed by **AS and D7** or **QIV** followed by **Q7D7** **IV treatment is stopped when the patient can eat and drink by him/herself**	**AS IV** followed by **AS7** or **AM IM** followed by **AS** or **QIV** followed by **Q** **IV treatment is stopped when the patient can eat and drink by him/herself**
E. PRESUMPTIVE			
8	Simple Presumptive	**Q7D7**	**Q7C7**
F. PREGNANT WOMEN			
	Case	**First 3 months (First Trimester)**	**Last 6 months (2nd/3rd Trimesters)**
9	**SIMPLE PV, PO,PM**	**CQ3**	**CQ3**
10	**SIMPLE PF or MIXED**	1ST ATTACK: **Q7C7 supervised** 2ND ATTACK: **AS7C7** 3RD ATTACK: **AS7C7**	1ST ATTACK: **AS7C7 supervised** 2ND ATTACK: **AS7C7** 3RD ATTACK: **AS7C7**
11	**UNCOMPLICATED HYPERPARASITAEMIA**	**Hyper AS7C7**	
12	**SEVERE PF of PV and SEVERE PRESUMPTIVE**	**AS IV** followed by **AS** and **C7**	
13	**SIMPLE PRESUMPTIVE**	**Q7C7**	

Abbreviations: see next page.
Drug doses: see Appendix.

Note: if available CoArtem (Artemeter + Lumefantrine) can be used to treat simple (uncomplicated) malaria

Key to Malaria Treatment table

CQ3	Chloroquine PO	Day 0-1	10 mg/kg OD
		Day 2	5 mg/kg OD

MAS3	Artesunate PO	Day 0-2	4 mg/kg OD
	Mefloquine PO	Day 1	15 mg/kg OD
		Day 2	10 mg/kg OD
	Or	Day 0	25 mg/kg STAT
	Or	Day 0,1,2	8 mg/kg OD

AS7D7	Artesunate PO	7 days	2 mg/kg OD
	Doxycycline PO	7 days	4 mg/kg OD

AS7C7	Artesunate PO	7 days	2 mg/kg OD
	Clindamycin PO	7 days	5 mg/kg TID

AS7	Artesunate PO	7 days	2 mg/kg OD

Q7D7	Quinine PO	7 days	10 mg/kg TID
	Doxycycline PO	7 days	4 mg/kg OD

Q7C7	Quinine PO	7 days	10 mg/kg TID
	Clindamycin PO	7 days	5 mg/kg TID

MAS7	Artesunate PO	Day 0	4 mg/kg OD
		Day 1-6	2 mg/kg OD
	Mefloquine PO	Day 5	15 mg/kg OD
		Day 6	10 mg/kg OD
	Or	Day 0	25 mg/kg stat

Hyper AS7D7	Artesunate PO	Day 0	4 mg/kg OD
		Day 1-6	2 mg/kg OD
	Doxycycline PO	7 days	4 mg/kg OD

Hyper AS7C7	Artesunate PO	Day 0	4 mg/kg OD
		Day 1-6	2 mg/kg OD
	Clindamycin PO	7 days	5 mg/kg TID

Hyper AS7	Artesunate PO	Day 0	4 mg/kg OD
		Day 1-6	2 mg/kg OD

AM	Artemether IM	first day	3.2 mg/kg stat
		>day 1	1.6 mg/kg OD
followed by: (when patient can take oral tablets):			
	Artesunate PO	IV+oral = 7 days	2 mg/kg OD
	Doxycycline PO	7 days	4 mg/kg OD

QIV followed by Q and D7 (or C7)

QIV	Quinine IV*	first dose	20 mg/kg
		after 8 hours	10 mg/kg TID
Followed by, when patient can take oral tablets:			
Q	Quinine PO	IV+oral = 7 days	10 mg/kg TID
D7	Doxycycline PO	7 days	4 mg/kg OD
or			
C7	Clindamycin PO	7 days	5 mg/kg TID

AS IV followed by AS and D7 ** (or C7)

AS	Artesunate IV	H0,12,24	2,4 mg/kg
		Every day	2,4 mg/kg OD
followed by, when patient can take oral tablets:			
AS	Artesunate PO	IV+oral = 7 days	2 mg/kg OD
D7	Doxycycline PO	7 days	4 mg/kg OD
or			
C7	Clindamycin PO	7 days	5 mg/kg TID

Do not give Doxycycline in Children < 8 years old and Pregnant Women
Do not give Mefloquine in Children < 5 kilogram (use A7C7)***

* Always give Quinine IV as an infusion. Dilute in D5W, D5S, D10W or NSS (see appendix)
** Artesunate IV reduce mortality by 30% when compared to Quinine IV.
*** If there is no child dose of clindamycin available use A7.

RAPID DIAGNOSTIC TESTS FOR MALARIA

Malaria cannot be diagnosed reliably from the symptoms. In areas of multi drug resistant malaria, laboratory diagnosis is best. In some places, as it is not possible to do microscopy, or because of time limitations, a rapid diagnostic test (RDT) is used.

Principle:
These tests are based on the detection of specific proteins (antigens). The test is positive (Coloured band and control band seen) if the antigen is found in the patient's blood. Available tests are detecting:

1. HRP-2 (Histidine-rich protein2): **Paracheck-Pf test** is most used here. (Orchid Biomedical Systems, India).
Only P.falciparum releases HRP-2:

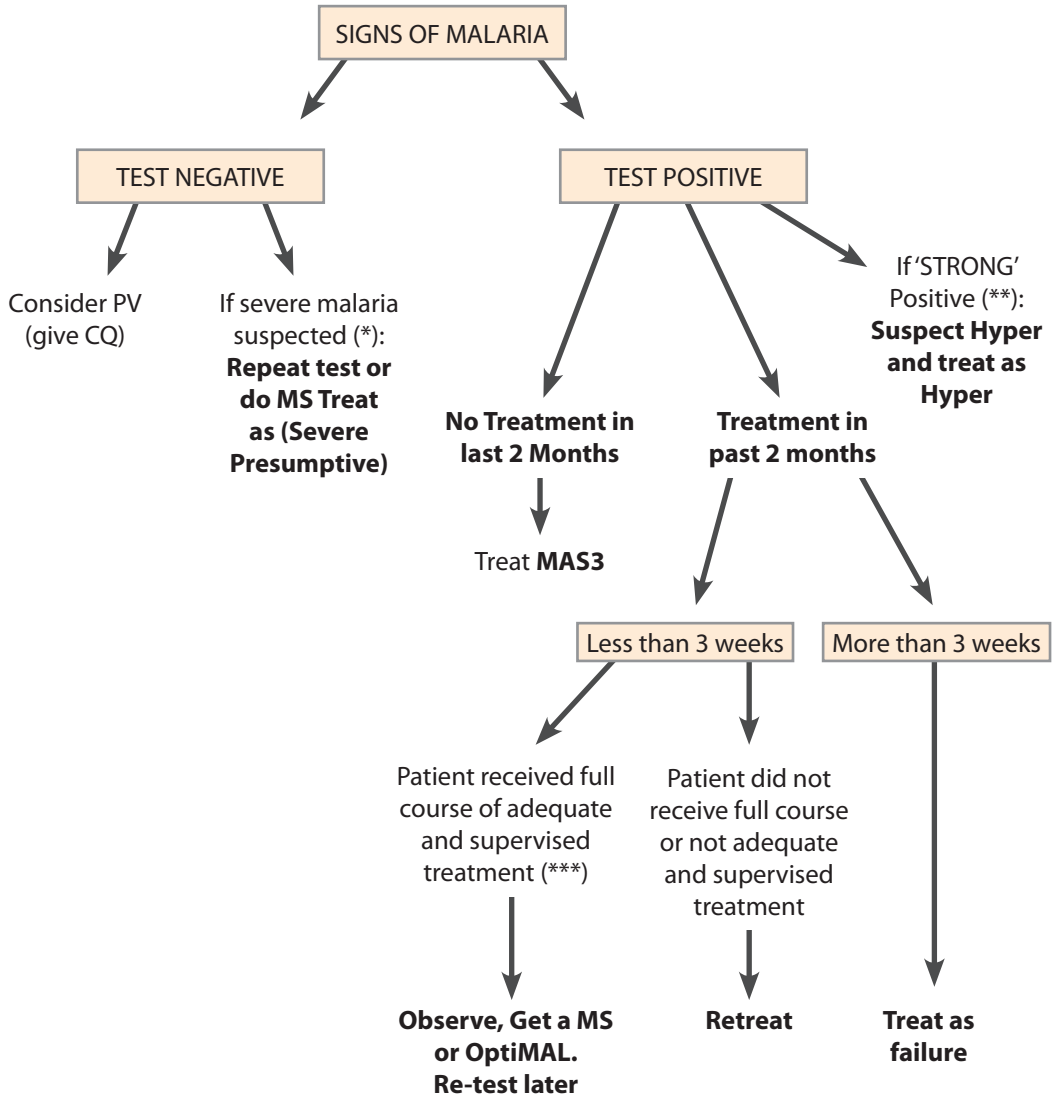
- **This test will be POSITIVE if patient has PF**
- **This test will be NEGATIVE if patient has PV, PM or PO**

Important notes:

- False negative results (i.e. test is negative, but the patient has falciparum malaria) have been reported in patients with severe conditions and very high parasitaemia (> 20% of RBC parasitised). This is rare, but severe malaria should not be excluded on the sole basis of a negative test: decide together with the clinical signs.
- The test can still be positive up to 1 month after a malaria attack. So a false positive result (test positive but no PF infection) can be seen in a patient with a recent infection successfully treated in the last 1 month.

2. pLDH (parasite Lactate Dehydrogenase): **OptiMAL** (Diamed, Switzerland)
This rapid test can detect P.falciparum and non-P.falciparum (P.vivax, P.malariae and P.ovale) but cannot detect mixed infections or distinguish between P.vivax, P.ovale and P.malariae.

Interpret Paracheck-Pf tests results:



NOTES:

(*): Do not forget that you cannot exclude severe malaria on the sole basis of a NEGATIVE test.

(**): A strong positive test is a test that turns positive as soon as the lysed blood reaches the reactive band and give an intense broad red line.

(***): Adequate treatments are: MAS3 or A7T7 (D7) or Q7T7(D7) **supervised** (see SMRU malaria handout).

15.3 VIRAL DISEASES

Dengue fever

SURVEILLANCE
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 wet season. Dengue can present in 2 ways:
1. Dengue Fever (DF) and
2. Dengue Haemorrhagic Shock Syndrome (DHSS) and/or Dengue Haemorrhagic Fever (DHF)

SIGNS AND SYMPTOMS

Dengue Fever is suspected in a patient with:

- Fever for 2-7 days AND negative malaria smear, no other identified cause of fever

AND at least **one of the following**:

- Haemorrhagic signs, tourniquet test positive*.
- Severe body pains.
- Typical rash (red maculopapular or petechial rash on the limbs).
- Low platelets (thrombocytopenia).

Other signs and symptoms that can be present:

- Severe headache.
- Skin rash: diffuse redness on the neck, face and chest.
- Lymph node enlargement (lymphadenopathy).
- Painful enlarged liver (tender hepatomegaly).
- Almost never enlarged spleen (no splenomegaly).

***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.

Dengue Haemorrhagic Shock Syndrome (DHSS) and Dengue Haemorrhagic Fever (DHF)

SIGNS AND SYMPTOMS

- As in Dengue Fever

PLUS

- Shock can develop, usually on the 3 rd or 4th day after the fever has decreased.
- Haemorrhagic signs: bleeding from the nose, gums and sometimes from the rectum.
- Generalised petechiae (red or blue dots on the skin) are common on the extremities, chest and face.
- No jaundice.

DIAGNOSIS

Is clinical but it can be confirmed by a laboratory test (serology).

TREATMENT

1. Dengue Fever

There is no drug to cure this disease. Treatment is to prevent complications.

- Treat the fever with paracetamol.

- **Do not give ASA – can make bleeding from platelet problem worse.**
- Hydration: start with ORS. If the patient is unable to drink, start an infusion of RL or 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. Dengue Haemorrhagic Shock Syndrome and Dengue Haemorrhagic Fever

- See Chart below.

If you notice an increase number of cases, inform the doctor.
A rapid response can avoid an epidemic

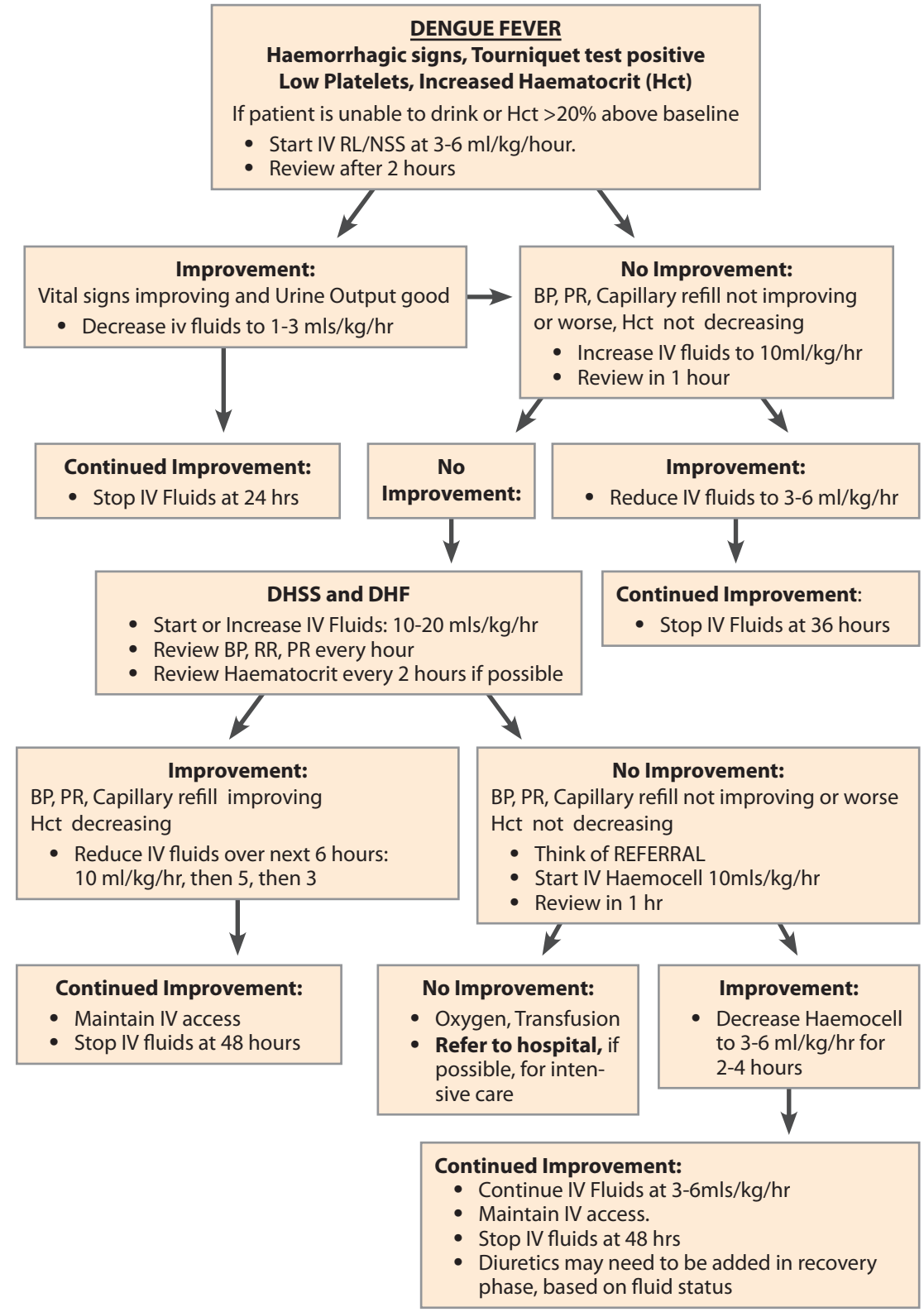
PREVENTION

The Aedes mosquito bites during the day. Individual protection against these mosquitoes are: long-lasting, impregnated bed nets for those who sleep in the daytime (e.g. patients in IPD); long sleeves and trousers; insect repellents; or burning mosquito coils.

VACCINATION

There is no vaccine available.

REFERENCES Malaria (**15.2**), Scrub typhus (**15.1**), Leptospirosis (**15.1**), Typhoid fever (**15.1**)


DENGUE FEVER
Haemorrhagic signs, Tourniquet test positive
Low Platelets, Increased Haematocrit (Hct)
If patient is unable to drink or Hct >20% above baseline
• Start IV RL/NSS at 3-6 ml/kg/hour.
• Review after 2 hours
Improvement:
Vital signs improving and Urine Output good
• Decrease iv fluids to 1-3 mls/kg/hr
No Improvement:
BP, PR, Capillary refill not improving or worse, Hct not decreasing
• Increase IV fluids to 10ml/kg/hr
• Review in 1 hour
Continued Improvement:
• Stop IV Fluids at 24 hrs
No Improvement:
Improvement:
• Reduce IV fluids to 3-6 ml/kg/hr
DHSS and DHF
• Start or Increase IV Fluids: 10-20 mls/kg/hr
• Review BP, RR, PR every hour
• Review Haematocrit every 2 hours if possible
Continued Improvement:
• Stop IV Fluids at 36 hours
Improvement:
BP, PR, Capillary refill improving
Hct decreasing
• Reduce IV fluids over next 6 hours: 10 ml/kg/hr, then 5, then 3
No Improvement:
BP, PR, Capillary refill not improving or worse
Hct not decreasing
• Think of REFERRAL
• Start IV Haemocell 10mls/kg/hr
• Review in 1 hr
Continued Improvement:
• Maintain IV access
• Stop IV fluids at 48 hours
No Improvement:
• Oxygen, Transfusion
• Refer to hospital, if possible, for intensive care
Improvement:
• Decrease Haemocell to 3-6 ml/kg/hr for 2-4 hours
Continued Improvement:
• Continue IV Fluids at 3-6mls/kg/hr
• Maintain IV access.
• Stop IV fluids at 48 hrs
• Diuretics may need to be added in recovery phase, based on fluid status

Encephalitis

SURVEILLANCE
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.
Yearly there are around 30,000-50,000 cases, 30% of which will result in death. For those who survive, 30% will have serious neurological sequelae (remaining neurological symptoms). After infection there is lifelong immunity.

SIGNS AND SYMPTOMS

The majority of infections are subclinical. Headache and fever might be the only symptoms for 1-6 days. Other more signs can be photophobia (fear of strong light), weakness, neck stiffness and convulsions. The disease can progress to paralysis, seizures, coma and death. Neurological problems after infection (sequelae): hemi paresis, deafness, mental retardation and emotional lability.

DIAGNOSIS

Lumbar puncture. Specific antibodies can be found in the cerebro-spinal fluid (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 such as unequal pupil size, non-reactive pupils, a very slow heart rate (<50 in adults) or irregular breathing. If you cannot perform a lumbar puncture but you are concerned that this case could be meningitis start antibiotics for bacterial meningitis.

TREATMENT

- If available treat with acyclovir.
  Symptomatic treatment:
- Pain relief (**see 7.5**).
- For seizures (**see 7.2**).
- See coma section for treatment of comatose patients (**see 7.1**).
- Physiotherapy: massage: perform passive limb movements 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 15.1**).

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, however it is expensive. In our region there is no routine vaccination for (Japanese) encephalitis.

REFERENCES Bacterial meningitis (**15.1**), Coma **(7.1**), Seizures (**7.2**), Pain relief (**7.5**)

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 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.

Every person infected with HIV will progress slowly towards AIDS. Death from this can take a long time. 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 they do not eliminate HIV infection.

TRANSMISSION AND PREVENTION

ROUTE OF TRANSMISSION	PREVENTION
Sexual Contact.	• Abstain from sexual contact OR • Be faithful to one uninfected partner OR • Use male or female condoms AND • Early diagnosis and treatment of sexually transmitted infections (STI). • PEP (post exposure prophylaxis, medicine you give immediately after the exposure). In the event of rape this may reduce the risk of HIV transmission (**see 6**).
Contaminated syringes and needles and other sharps. For example, intravenous drug users, health workers, tattoos.	• Avoidance of injecting drug use. • Do not share needles and syringes and always use a new sterilised needle and syringe. • Do not share cutting implements e.g. tattooing needles, ear piercing needles, razor blades. • Universal precautions for health workers. • PEP in the event of occupational exposure may reduce the risk of HIV transmission.
Infection by blood and blood products. For example, blood transfusion by HIV contaminated blood.	• Follow protocol for transfusion (**see 14.1**). • Screening of donors with a questionnaire to assess risk of HIV infection. • HIV testing of blood donors before transfusion (should be provided with pre and post-test counselling if available). If not available screen the blood but do not inform the donor of the result.
Mother to child transmission.	• See Prevention of Mother to Child Transmission (PMCT) below.

DIAGNOSIS HIV testing

WHY SHOULD YOU TEST FOR HIV?

(a) 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 the provision of safe blood NOT the diagnosis of HIV in an individual (See Transfusion section, **14.1**).

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.

(b) Diagnosis of HIV infection

Before testing, your clinic needs to be able to offer the patient the following:

1. CONFIDENTIALITY

The information about a person's status (negative or positive) must never be passed on to anyone without that person's permission. People are better able to discuss their feelings if they know that the counsellor will not tell anybody else without their permission.

2. PRE-TEST COUNSELLING

This consists of information and support given before the HIV test to enable people to make an informed choice about whether to take the test.

3. INFORMED CONSENT

After pre-test counselling, the person understands what HIV and AIDS and his or her individual risk of HIV are. **The decision to have the test is up to the person.** You have to respect his or her decision and cannot test if the person does not wish to be tested. Informed consent needs to be obtained from the person, not the relatives.

4. POST-TEST COUNSELLING

This is provided after the test result. It is essential to help those with a positive test to cope with the news, to live positively, and to be referred for appropriate clinical care, nutritional support and psychosocial support. Post-test counselling is also important in order to advise those with a negative result about how to prevent HIV infection in the future and to STAY negative.

5. LABORATORY TESTING

Testing can be done either with rapid tests in the camp or with ELISA or Western Blot in the hospital. A minimum of 2 different tests should be used. To make the right diagnosis, protocols should be followed strictly, and quality must be assured.

6. REFERRAL FOR APPROPRIATE CLINICAL, NUTRITIONAL, PSYCHOLOGICAL AND SOCIAL SUPPORT SERVICES

There is a lot that can be done for HIV positive persons to provide them with the necessary health and psychosocial care and support. Much of this can be provided within the camp setting and linkages between VCT services and treatment, care and support need to be established.

SIGNS AND SYMPTOMS

Primary HIV infection

- This is the stage that begins immediately after the person is infected.
- Even if the test is negative, the person can transmit the virus to others.
- When the body starts to produce antibodies, the HIV test will become positive (2 weeks to 3 months after the infection).
- Clinically the patient can have **acute retroviral syndrome** (fever, rash, enlarged lymph nodes) for some days or weeks.

Clinical staging according to WHO (World Health Organisation):

Clinical Stage 1

- Asymptomatic.
- Persistent generalised lymphadenopathy.

Clinical Stage 2: Mild Disease

- Weight loss 5-10% of body weight.
- Recurrent upper respiratory tract infections, such as 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 350mm3)

- 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 200mm3)

- HIV wasting syndrome (severe malnutrition).
- Severe disseminated extrapulmonary TB.
- Severe infections (Cryptococcus meningitis, oesophageal candidiasis, pneumocystis carinii pneumonia (PCP) and many others).
- Cancers (invasive cervical cancer, lymphoma and Kaposi's sarcoma).

THERAPY - ANTI RETROVIRAL THERAPY (ART)

There are 3 classes of drugs currently in use:

1. **NRTI's** (Nucleoside Reverse Transcriptase Inhibitors); 3TC, D4T, ddI, AZT.
2. **NNRTI's** (Non - Nucleoside Reverse Transcriptase Inhibitors): Nevirapine (NVP), Efavirenz.
3. **PI's** (Protease Inhibitors): Ritonavir, 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 used: GPO-vir. This tablet contains 3TC, D4T and NVP, and is taken BID. GPO-vir is used as first line treatment for HIV-AIDS in Thailand.

Therapy is life-long as these drugs do not cure HIV.
If the drugs are stopped the virus begins to multiply again.

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.

See next pages for 'general management of HIV positive persons' and 'prophylaxis and treatment of opportunistic infections'.

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 such as those offered by COERR (Catholic Office for Emergency Relief and Refugees).

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 21.5**).
- Do 3 x sputum smear, if symptoms of pulmonary TB.
- Refer for chest x-ray if sputum smear is negative and symptoms suggestive of TB (sputum culture for TB is available in some camps).

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 assists 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 degree of immune suppression.
- Recommendations for antiretroviral treatment and prophylaxis against OIs are based on the degree of immune suppression. Normal laboratory ranges are between 500 to 1400/m^m3.

6. Determine the need for prophylaxis of opportunistic infections and antiretroviral therapy based on clinical stage or CD4 count.

7. Nutritional support
a. Offer the supplementary ration provided by TBBC for all those with chronic illness, including HIV and AIDS
b. Provide nutrition counselling.

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.

DIAGNOSIS & TREATMENT OF COMMON HIV-RELATED ILLNESS AND OPPORTUNISTIC INFECTIONS

1. Chronic Diarrhoea (See 12.1)

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: Treat with **metronidazole**. If there is no response, or when there is fever, add **ciprofloxacin** (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 (pneumonia, UTI, pyomyositis, bacteraemia), TB or atypical mycobacteria, viral infections (URTI, CMV, Epstein-Barr virus) or malignancies such as lymphoma.

TREATMENT

If you find no cause of the fever (FUO = fever of unknown origin), 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.

i. If there is an abrupt onset, high fever, and/or cough with sputum (may be purulent)
   ➔ Treat as bacterial pneumonia (**see 21.2**)
   If signs of severity: admit to IPD and treat as severe pneumonia

ii. In case of 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.
   ➔ Treat as Pneumocystis carinii Pneumonia (PCP):
   Admit to IPD
   Cotrimoxazole: 1600/320mg (sulphamethoxazole/trimethoprim component) TID PO for 21 days
   If severe dyspnoea ADD:
   Prednisolone: Child: 2 mg/kg/day then decrease gradually

Adult: 40mg BID x 5 days, then 40 mg OD x 5 days, then 20mg OD x 5 days until completion of treatment

iii. If there is cough > 3 weeks that is not responding to antibiotics +/- blood stained sputum, +/- night sweats or evening fevers

➔ Manage as TB suspect (**see 21.5**)

4. Tuberculosis

SIGNS AND SYMPTOMS

Signs and symptoms are the same as for patients who are not infected with HIV. However, AFB test is often negative even in pulmonary TB. Extrapulmonary disease is more common.

TREATMENT

Same drugs, protocols, duration and side effects as for treatment of other TB patients (see section on TB).

ALL HIV positive people diagnosed with TB should be started on cotrimoxazole prophylaxis regardless of the CD4 count

5. Oral Candidiasis (Thrush) See 9.1 and 22.7

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 1%:	local application after each meal x 7 days	
OR	**Nystatin**	tablets 500,000 IU QID x 10 days or 200,000 IU oral suspension 5 x daily for 7 days	
	If no improvement:		
	Ketoconazole:	Child>2 year:	3-6 mg/kg/day x 7 days
OR	Fluconazole:	Adult:	200 mg OD PO x 7 days
		Child:	2-4 mg/kg/day x 7 days
		Adult:	100mg OD x 14 days

6. Oesophageal Candidiasis

SIGNS AND SYMPTOMS

Pain and difficulty swallowing food usually associated with oral thrush. This is the major cause of weakness and weight loss in AIDS.

TREATMENT

Fluconazole 200 - 400mg OD x 14-21 days. Note: treatment should not exceed 21 days.

7. 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).

LABORATORY

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

Amphotericin B	0.7-1.0mg/kg/day IV 2 weeks, followed by fluconazole for eight weeks	
OR		
Fluconazole	Child:	4-6 mg/kg/day 8 weeks
	Adult:	400-800mg OD 8 weeks
	Give secondary prophylaxis (fluconazole) after recovery.	

8. Penicilium marneffei infection

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 disease. Disseminated disease can be rapidly fatal.

LABORATORY Blood or skin lesions fungal culture.

TREATMENT

Amphotericin B	0.5-0.7 mg/kg daily for two weeks OR
Itraconazole	200 mg daily for two weeks
Secondary prophylaxis: **Itraconazole** 200 mg daily	

PROPHYLAXIS (PREVENTION) OF OPPORTUNISTIC INFECTIONS

Each infection makes the PLWH weaker, resulting in 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:	Used to prevent new infections in someone who has already had one or more infections and recovered.

1. Cotrimoxazole prophylaxis

This mainly prevents Pneumocystis Carinni Pneumonia (PCP) and toxoplasmosis. It is also effective against certain types of bacterial pneumonia and intestinal infections.
All patients fitting in the next protocol should receive **cotrimoxazole:**

- All HIV-infected people above 15 years with no signs of active pneumonia **AND** CD4 count <350/ mm3 (if they have signs of active pneumonia, they should receive treatment dose. See treatment of opportunistic infections below).
- Patients with WHO stage 3 or 4 HIV-related illness (**see HIV stages,15.3**).
- HIV infected persons diagnosed with tuberculosis.
- Patients with previous PCP or previously treated toxoplasmosis (=secondary prophylaxis).

Dose (primary prophylaxis and secondary prophylaxis is the same dose):
cotrimoxazole single strength (TMP 80 mg - SMX 400 mg), 2 tablets OD.

Note: In case of allergy to cotrimoxazole, use Dapsone 100 mg OD.
In HIV-infected pregnant women who need prophylaxis cotrimoxazole can be given at the same dose as other adults.

When to stop: If CD4 Count > 350 /mm3 after at least six months of ARVs.
If ARV not available, treatment will be life-long.

Children
ALL children born to HIV-infected mothers should receive cotrimoxazole starting at 4-6 weeks.

- Give TMP-SMX 6-8 mg/kg /day (of the TMP component) in a single dose.
- If the child is unable to tolerate cotrimoxazole, dapsone should be used in a dose of 2mg/kg/day in a single dose. G6PD deficiency needs to be excluded first. If the child is deficient in G6PD discuss with a medical officer.
- Prophylaxis with cotrimoxazole can be stopped if the child is confirmed HIV negative or if the CD4 count is > 20% under ART.

2. Fluconazole Prophylaxis

Fluconazole prophylaxis is used to prevent cryptococcal meningitis. Cryptococcus is rare in children and prophylaxis is not recommended.

(a) Primary prophylaxis
Patients that match the next protocol should receive fluconazole (delay until after delivery in pregnant women):

- **CD4 count < 100/mm3.**
- **Cryptococcal disease** excluded clinically AND by a negative serum cryptococcal antigen (if cryptococcal disease is present, a higher dose of fluconazole is recommended, see treatment of opportunistic infections below).

Dose **fluconazole** 400 mg / week (the same day of the week).
When to stop When CD4>100/ mm3 after at least six months of ART. If no ART then prophylaxis is life-long.

(b) Secondary prophylaxis
Patient had proven cryptococcal disease and recovered; prophylaxis given after 10-12 weeks of treatment.
Dose **fluconazole**: 200 mg daily PO.
When to stop CD4 Count > 100/mm3 after at least six months of ART.
If ART not available, prophylaxis is life-long.

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 ARVs 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 needs special care. Her first response to 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 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 ARV during pregnancy

HIV transmission from mother to the infant may be reduced by giving antiretrovirals during pregnancy and after delivery. Many different protocols exist; the most common use two or three of zidovudine, iamividune and/or nevirapine 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 ARV 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

Formula feeding is preferred in most HIV+ mothers. 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.

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.
If education, clean water and adequate fuel are not available, breastfeeding is preferred despite the higher risk of HIV transmission. Otherwise the baby will be at an increased risk of dying due to diarrhoea.

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.

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.
- At each visit the HIV positive pregnant woman should receive supplementary feeding.
- Delivery should take place in the clinic.

Babies:

- Cotrimoxazole for the first 18 months as PCP prophylaxis (**see 15.3**).
- **Children born to HIV-infected mothers should receive the same immunisations as other children EXCEPT**
- **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 at 12 and 18 months.

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

- Fever (>38.5°C) more than 3 days, **and**
- Red eyes (Conjunctivitis), runny nose, cough.
- Sometimes white spots on the mucosa of the mouth (Kopliks spots).
- After two to three days, red spots appear on the whole body (red rash), beginning on the neck, chest then abdomen and legs.

COMPLICATIONS

- Pneumonia.
- Otitis Media.
- Diarrhoea, leading to dehydration and malnutrition.
- Corneal ulceration leading to blindness (increased risk when Vitamin A deficient).
- Encephalitis.
- Death.

DIAGNOSIS Clinical. The virus can be found in blood, urine and sputum by serology.

TREATMENT PREVENTION OF COMPLICATIONS:

- Treat the fever, diarrhoea and dehydration with paracetamol and ORS.
- Oral hygiene by rinsing mouth. Apply **1% gentian violet** to mouth sores.
- Give treatment dose of **vitamin A**: (**see 17.2**). Repeat the next day.
- Daily eye wash. Treat conjunctivitis with **Terramycin Eye Ointment**.
- Treat secondary infections; Pneumonia (**see 21.2**): **amoxicillin**
  Otitis media (**see 21.1**): **amoxicillin.**
- Advise the mother to continue breast-feeding and to give normal food to older children.
- If the measles case is in IPD, vaccinate all other unimmunised children > 6 months in the hospital.

PREVENTION = VACCINATION

Routine single dose (0.5 ml) vaccination over the age of 9 months (**see appendix 24**).

REFERENCES Pneumonia (**21.2**), Otitis media (**21.1**).

Every single case should be notified and reported, as there is a high risk of epidemic.

Poliomyelitis

URGENT REPORT
SEE APPENDIX

DEFINITION

Poliomyelitis is an acute viral infection due to a poliovirus. This virus infects the spinal cord cells of a patient, resulting in paralysis. Transmission from human to human is direct (stool-hand-oral) or indirect (eating food or drinking water that is contaminated by stools). The disease can be prevented by a polio vaccine.

SIGNS AND SYMPTOMS

- Most of the infected patients have no symptoms.
- Non paralytic form: fever, muscle pain, headache, vomiting, backbone pain.
- Paralytic form: rapid asymmetrical flaccid paralysis starting at the legs and moving toward the head. The muscles become soft and reflexes disappear. Sensation of the skin remains normal. Patients die if the respiratory muscles become paralysed.

DIAGNOSIS

Clinical. Suspect poliomyelitis in all patients with acute paralysis.
Polio virus can be detected in stool samples.

TREATMENT

Paralytic form:

- Keep in IPD, bed rest.
- Treat the pain.
- Prevent sores.
- Physiotherapy to prevent wasting of muscles and stiffness.

Do NOT give any IM injections to a patient with suspected poliomyelitis. You will make the (paralytic) polio worse.

PREVENTION & VACCINATION

- Oral polio vaccine at birth, and at 6, 10 and 14 weeks, and one year after the last dose.
- 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.

REFERENCES

Vaccination table (see appendix)

Rabies

URGENT REPORT
SEE APPENDIX

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

- Itching, pain or numbness at the site of the bite (starting 20-90 days after the bite).
- 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.

Pregnancy or infancy are NEVER contraindications to rabies post-exposure treatment

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 7.5**) or diazepam (**see 7.2**).

Symptomatic disease can be prevented by:

1. local wound care.
2. post exposure prophylaxis (vaccine and / or anti-rabies immunoglobulin).

1. Wound care:

- Wash and flush a wound or point of contact with soap and water.
- Apply ethanol, or povidone iodine.
- If the wound is a bite: excise the necrotic tissue. Suturing (closing the wound) should be postponed for 24 hours, but if necessary, immunoglobulin must be applied first.
- Anti-tetanus treatment and antibiotics (**see wound care and tetanus 22.4**) should be administered to control infections other than rabies.

2. Post exposure prophylaxis:

Define the category of exposure (from WHO):

Category I: Touching, feeding of animals or licks on intact skin:	**no treatment if history reliable**
Category II: Minor scratches or abrasions without bleeding, or licks on broken skin and nibbling of uncovered skin:	**vaccine immediately** stop if the dog remains healthy for 10 days
Category III: Single or multiple transdermal (through the whole skin) bites, scratches or contamination of mucous membrane with saliva (i.e. licks):	**immunoglobulin + vaccine immediately** 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 applied for all Category III exposures and for Category II exposures in immune suppressed patients. This immunoglobulin can be given until day 7 after the exposure.

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 RIG. The total recommended dose should not be exceeded. If the calculated dose is insufficient to infiltrate all wounds, sterile saline may be used to dilute it 2 to 3 fold to permit thorough infiltration

Schedules for vaccines:

- **Intramuscular regime:**
  Intramuscular vaccines should not be injected into the buttock region. Use the shoulder muscles.
  * Classical 5 dose:
  One dose of the vaccine (1mL) should be administered on days 0, 3, 7, 14 and 28 in the deltoid region or, in small children, into the antero-lateral area of the thigh muscle;
  * As an alternative, the 2-1-1 regimen may be used.
  Two doses are given on day 0 in the deltoid muscle, right and left arm. In addition, give one dose in the deltoid muscle on day 7 and one on day 21.
- **Intradermal (ID) (into the skin) regime:**
  Intra dermal injections reduce the volume of vaccine required and vaccine cost by 60% to 80%.

* 2-site intradermal method (2-2-2-0-1-1)		
Day 0,3,and 7:	0.1 or 0.2 ml ID in 2 sites	(deltoid muscle of two arms)
Day 28 and 90:	0.1 or 0.2 ml ID 1 site	(deltoid muscle of one arm)
* 8-site intradermal method (8-0-4-0-1-1)		
Day 0:	0.1 ml ID into 8 sites	(2 x deltoid, suprascapulum, lower quadrant abdominal wall, thighs)
Day 7:	0.1 ml ID into 4 sites	(2 x deltoids and thighs)
Day 28:	0.1 ml ID into 1 site	
Day 91:	0.1 ml ID into 1 site	
The 8 sites regimen should be considered in emergency situations when no RIG is available.		

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).

REFERENCES Wound Care (**22.4**)

MUSCULOSKELETAL DISORDERS 16

16.1 DISORDERS OF THE JOINTS

Disorders of the joints can be due to infection (septic arthritis), non-infectious causes (inflammatory diseases), or injury (strains and sprains). The treatment of trauma is not discussed in these Guidelines.

Septic arthritis

DEFINITION

Acute bacterial infection of a single joint (mono articular) or many joints (poly articular), usually not symmetrical (usually on only one side of the body). Septic arthritis of a single joint is more common in children and is usually caused by Staphylococcus, but Haemophilus influenza is common in unvaccinated children. Septic arthritis of many joints is more common in adults and may be due to Gonococcus. There are greater numbers of cases in patients with recent trauma or rheumatoid 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).
- Low-grade fever.

DIAGNOSIS Clinical. Aspiration of pus from the joint: pus culture.

Consider gonococcal arthritis:

- Migrating joint pain for 1 to 4 days.
- Pain in the hands/wrists due to tendon. Inflammation.
- Single joint pain.
- Fever.
- Skin rash (lesions are flat, pink to red, may become pustular or purpuric).
- Urethral or vaginal discharge.
- Pain or burning on urination.
- Lower abdominal pain.

Diagnosis and adequate treatment requires frequent drainage of joint fluid

TREATMENT

Children < 5 years:

- Admit to IPD.
- Give IV **cloxacillin AND gentamicin** IM/IV, followed by 21 days oral.
- If no improvement at day 3 add **ceftriaxone** IM/IV for 21 days.
- Try to splint and rest the joint during the first few days especially if it is a weight-bearing joint like the hip or knee.

Children > 5 years:

- Admit in IPD
- Give IV **cloxacillin** for 3 days, followed by 21 days oral.
- If no improvement at day 3 add IM/IV **gentamicin** for 5 days.
- Try to splint and rest the joint during the first few days especially if it is a weight-bearing joint like the hip or knee.

Adults:

(a) If no signs of sepsis, treat in OPD:

- PO **cloxacillin** 500 mg QID for at least 21 days.

(b) If high fever and patient's condition is poor or if no improvement after 2 days of OPD treatment:

- IM/IV **cloxacillin** until clinically better (continue oral treatment for at least 21 days) and consider gonococcal arthritis.

If signs of gonococcal arthritis:

- Add 21 days of Ceftriaxone IV/IM.

PREVENTION

Preventive antibiotics may be helpful for high-risk people (e.g. recent land mine injury).

REFERENCES

STI (**13.5**).

Non infectious arthritis

There are many causes of non-infectious arthritis,
The most common are osteoarthritis, rheumatoid arthritis and gout.

It can be 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

(a) OSTEOARTHRITIS / ARTHROSIS

DEFINITION

Osteoarthritis is a low-grade inflammation of the joints, caused by damage or overuse of the cartilage that covers and acts as a cushion inside joints. As the bone surfaces become less well protected by cartilage, the patient experiences pain upon weight bearing, including walking and standing. The most common joints affected are the hips, knees, spine, feet and hands.

SIGNS AND SYMPTOMS

- Chronic pain; leading to decreased movement of the joints and stiffness.
- Joints often swollen and deformed with crackling noise on movement.
- Wasting of muscles, and ligaments may become more lax.
- The affected joints usually feel worse the more they are used throughout the day.

DIAGNOSIS

Clinical diagnosis. An X-ray of the affected joint could confirm the diagnosis.

TREATMENT

- Paracetamol.

- Anti-inflammatory medication: like indomethacin, ASA, ibuprofen (**see 7.5**).
  Often pain relief is needed long-term: be careful of side-effects, especially in old people.

PREVENTION

Regular exercise, if possible, in the form of walking or swimming. Applying local heat before, and cold packs after exercise, can help relieve pain and inflammation, as do relaxation techniques.

REFERENCES Pain (**7.5**)

(b) RHEUMATOID ARTHRITIS:

DEFINITION

Chronic inflammation of the lining of the joints with complications in the whole body. Symptoms get worse in intervals and can lead to severe destruction and deformity of the joint. Symptoms usually start after 40 years of age. (However, rheumatic disease can begin in childhood: Still-disease; joint inflammation together with skin changes and spleen enlargement). Frequently more than one joint is affected: the inflammation is symmetrical (both sides of the body). The hands of a patient are the main area to be affected.

SIGNS AND SYMPTOMS

- The joints (often hand joints, wrists and knees) are tender, swollen and warm.
- Active and passive movements are painful and restricted.
- The patient often says the joints are stiff in the morning ('morning stiffness') and getting better during the day.

Complications:

- Joint deformity due to destruction of components of the joint.
- Anaemia, skin nodules, pericarditis, lung fibrosis.
- Inflammation of the eye (iris), which can lead quickly to blindness (common in children).

DIAGNOSIS

Clinical diagnosis, an X-ray of the affected joint could confirm the diagnosis, Hct/Hb.

TREATMENT

- Anti inflammatory medication: aspirin, ibuprofen, indomethacin (**see 7.5**).
- Several drugs can suppress the disease process in rheumatic arthritis: e.g. gold, penicillamine, antimalarials (chloroquine) or methotrexate. Always discuss with a doctor about this treatment and drug doses. These drugs should be continued for 4-6 months of treatment.
- Long term steroid therapy in low dose: **prednisolone PO 7.5 mg OD**.
- Treat anaemia (**see 14.1**).

Note:
* For steroids, use the lowest dose possible. Never stop steroids suddenly, explain to the patient the possible side effects of long-term steroid use (e.g. peptic ulcer, weak bones, glaucoma, more infections).
* If a steroid needs to be given together with ibuprofen or indomethacin, add omeprazole in order to prevent gastric bleeding (**see 7.5**).

PREVENTION

Continue exercise, if possible, in the form of walking or swimming. Wrist splints may give symptomatic help and may improve the function of the joint.

REFERENCES Pain (**7.5**), anaemia (**14.1**).

(c) GOUT

DEFINITION

Painful inflammation of the joints, caused by abnormal crystals (little stones) containing Urea. The elevated level of Urea can be related to diet or to some medicines. Most common in knees and joints of the feet (big toe) = 'Podagra'.

SIGNS AND SYMPTOMS

- Severe acute joint pain.
- Joints (mostly joint of the big toe) are hot, swollen and red.

COMPLICATIONS

Deformity of the affected joints, kidney stone formation, renal failure.

DIAGNOSIS

Clinical and laboratory: in the blood, CBC (elevation of leukocytes), ESR and Uric acid.

TREATMENT

Acute:

- Anti-inflammatory drugs such as **Ibuprofen or Indomethacin (do NOT use aspirin).**
- If no response, consider treating with steroids after consultation with doctor.

Chronic:

- **Allopurinol**, only start 3 weeks after attack (100-300 mg OD).

Note:
* For steroids use the lowest dose possible. Never stop steroids suddenly, explain to the patient the possible side effects of long-term steroid use (e.g. peptic ulcer, weak bones, glaucoma, more infections).
* If steroid need to be given together with Ibuprofen or Indomethacin, add omeprazole in order to prevent gastric bleeding (**see 7.5**).

PREVENTION Adjust diet: no alcohol, avoid meat, eat lots of vegetables.

REFERENCES Pain (**7.5**).

16.2 OSTEOMYELITIS

DEFINITION

Osteomyelitis is an infection of bone, usually caused by bacteria, that occurs mostly in children. Micro-organisms spread to the bone via the blood stream from an infection in another location, such as otitis media or pneumonia. Bacteria can also come from local areas of infection, such as cellulitis or penetration wounds. Pus can block the normal blood supply to all bone parts, causing necrosis and therefore easily fractured bones. Mostly the causative bacteria are Staphylococcus aureus. When an acute infection has not been treated well, osteomyelitis can become chronic and this can lead to bone sclerosis and deformity.

In most cases infection is of the tibia, the femur, the humerus, and the vertebral bodies. Osteomyelitis involving the vertebral bodies is caused by Staphylococcus aureus in almost half of the cases and the other half are due to tuberculosis.

SIGNS AND SYMPTOMS

- Pain in the bone.
- Local swelling, redness, and warmth.
- Fever.
- Nausea.
- General discomfort, uneasiness, or ill feeling (malaise).
- Fracture without trauma.
- Drainage of pus through the skin (in chronic osteomyelitis).

DIAGNOSIS

- CBC shows elevated white blood cell count.
- 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.

TREATMENT

Osteomyelitis always requires prolonged antibiotic therapy, lasting a matter of weeks or months, and may require surgical debridement. Never forget pain treatment. Severe cases may lead to the loss of a limb. Initial first line antibiotics are determined by the patient's history, the location of infection, and age differences of common infective organisms.

Antibiotic Treatment: at least 6 weeks of antibiotic treatment:

1. Infant (<4 months)	IV 4 weeks:	**Cloxacillin IV** AND **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 treatment: **cloxacillin**. Check ESR and continue treatment until ESR is normal.		
2. Child (>4 months) and Adult	IV 4 weeks:	**Cloxacillin IV**.
After 4 weeks, if clinical condition is much better, no more fever and clinical signs are much improved, switch to oral treatment. Check ESR and continue treatment until ESR is normal.		
If associated with wounds, diabetes mellitus, ulcer:		**Clindamycin AND Ciprofloxacin**
		or **Cloxacillin and Ciprofloxacin and Metronidazole**. Check ESR and continue treatment until ESR is normal.

Surgical Treatment:

Always evaluate the need for surgical debridement. If the osteomyelitis is not caused by haematogenous spreading, also evaluate the need for surgical debridement. Then refer to orthopaedic consultation for advice and treatment.

PREVENTION

Acute haematogenous osteomyelitis can be avoided by preventing bacterial seeding of bone from a remote site. Preventing acute haematogenous osteomyelitis by seeding from other infections involves the appropriate diagnosis and treatment of primary bacterial infections.
Direct inoculation osteomyelitis can be best prevented with appropriate wound management and consideration of prophylactic antibiotic use at the time of injury.

REFERENCES Pain (**7.5**).

17.1 MALNUTRITION

DEFINITION

Malnutrition results from not eating enough food or not enough of the right kinds of food, or from infections that cause a loss of appetite, or changes in how the body uses nutrients.

If a child does not eat the right kind of food in the right amounts, growth slows or stops. Malnourished children are more likely to become ill and to die from illness than other children.

Children 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.

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.
- Calculate the Weight for Height Z-score (W/H Z score) using the Weight for Height Z score Table (see appendix).

SIGNS AND SYMPTOMS / DIAGNOSIS OF MALNUTRITION IN CHILDREN

1. MODERATE MALNUTRITION

Weight for height is less than -2 z scores (between -3 and -2 z scores in weight/height chart).

2. SEVERE MALNUTRITION

Weight for height is less than - 3 z scores **or bilateral pitting** oedema is present.

There are three types of severe malnutrition:

(a) Marasmus malnutrition

- 'Skin and bones', looks very thin, little fat or muscle.
- Child looks like an old man.
- Does not want to eat, apathetic.
- 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.

MANAGEMENT

Moderately malnourished children will be followed in OPD on a **Supplementary Feeding Programme (SFP)**
Severely malnourished children will be admitted to IPD on a **Therapeutic Feeding Programme (TFP)**

Be sure to follow the treatment protocol exactly.
The outcome depends mostly on the motivation and effort of the person feeding the child.

On Admission/When to discharge:

- Record the child's weight, height and the W/H Z score.
- Mark on the chart the target weight at which you want to discharge the child from the programme:

Moderate malnourished children (Supplementary Feeding Programme (SFP)):
Discharge when weight is >-1.5 Z scores W/H for 2 weeks in a row
Severe malnourished children (Therapeutic Feeding Programme (TFP)):
Discharge when weight is >-2 Z scores W/H for 2 weeks in a row – **refer to SFP**.

Note: be sure to re-measure the child's height every month and recalculate the child's target weight.

Moderate malnutrition

(-3 TO <-2 Z SCORES W/H)

Refer the child to the Supplementary Feeding Program (SFP). The child can be treated at home.
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 frequent 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 systemic treatment and treat any other diseases – look for diarrhoea, anaemia, other chronic infections

3. Encourage a normal diet

Explain that the child should eat the foods provided (SFP food, AsiaMIX with oil, eggs, beans, other foods) but should not be forced. The child should be encouraged to continue eating his/her normal foods (rice, fish, vegetables, bananas), and eat the SFP foods between meals – THIS IS VERY IMPORTANT.

4. Ask the mother to return every week to receive food distribution

5. Weigh the child weekly and mark it on the chart

- If the child does not gain weight within 6 weeks, admit to IPD for supervised feeding and follow the protocol for discharge from therapeutic 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.

6. 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.

7. Ensure follow-up health and nutrition education in the household by home visitors

SYSTEMATIC TREATMENT		
Deworming	1-2 years >2 years	albendazole 200 mg OD x 3 days mebendazole 100 mg BID x 3 days
Vitamin A	<6 months old 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		10 mg daily for 6 weeks
Folic Acid		5 mg on day 1, then 5 mg/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 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 yellow card. If they have been referred from TFP, do not retreat for vitamin A or deworming. Continue with other treatment.		

Severe malnutrition

(< -3 z score W/H OR WITH BILATERAL PITTING OEDEMA)

Severe malnutrition is a MEDICAL EMERGENCY and MUST be treated in the IPD. Patients need constant monitoring. The treatment is divided into two phases.

Phase 1 is mostly medical 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). **See 17.1**.

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.

See BOX 1 for instructions on how to prepare Phase 1 High Energy Milk (HEM) and to give the right amount and frequency.

Only use a naso-gastric tube when the child cannot drink, but this should be the last option. Monitor the amount of food the child is eating according the example in **BOX 2**.

Prevent hypoglycaemia – give frequent, small quantities during the day **and night**. Some very weak children will need feeding every hour.

Prevent the child from becoming cold – encourage the mother to hold the child close to her at all times. Do not wash the child during the first days.

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 (otherwise you will give too much salt) or ReSoMal (**see BOX 3**).
- 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 clean drinking water.

Give systematic treatment (see BOX 4) and treat infections with antibiotics. A severely malnourished child can have severe infections without fever. Septic shock is a serious complication of severe malnutrition. To prevent this, give antibiotics to all severely malnourished children.

Check Malaria Smear in every child, even if they do not have a fever. **Monitor the vital signs and urine output** regularly. **Weigh the child daily** and record the weight on the chart.

BOX 1

PHASE I - HIGH ENERGY MILK (HEM)	
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	= **135 cc x body weight (kg)** number of meals per 24 hours.

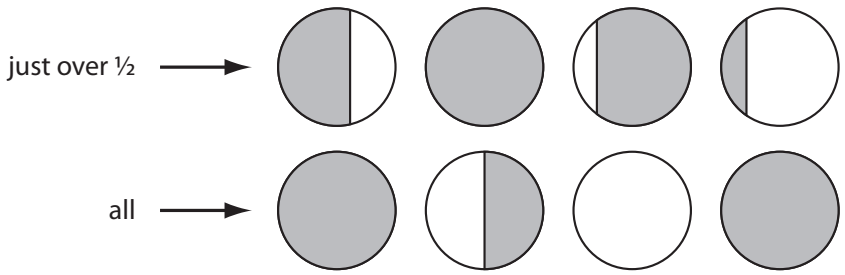
HOW TO MAKE PHASE 1 - HIGH ENERGY MILK (H.E.M.)

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 (or fill to 1 L)		Add mineral mix if available (from UNICEF).

DO NOT STORE AND RE-USE HEM THAT HAS NOT BEEN EATEN – IT CAN CAUSE DIARRHOEA

BOX 2

RECORD THE AMOUNT OF FOOD THAT HAS BEEN EATEN THE FOLLOWING WAY:
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.



BOX 3

HOW TO MAKE DILUTE ORS
(see ORS preparation, 24.6)

1 packet (size for 750cc water) of ORS powder + **1500** cc clean water + 30g sugar + 1.5g potassium

OR

1 packet (size for 1000cc water) of ORS powder + **2000** cc clean water + 40g sugar + 2.5g potassium

BOX 4

SYSTEMATIC TREATMENT		
1. Antibiotics to be given to all children with severe malnutrition:		
Stable children:		oral amoxicillin
Kwashiorkor or severely sick children:		IM* **penicillin/ampicillin** and IM **gentamicin**
When improved:		switch to oral **amoxicillin**
If no improvement in 3 days or suspected meningitis:		IM* **ceftriaxone** for 5 days then oral **amoxicillin** (*avoid IV in these children)
2. Vitamin A:	<6 months old 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
3. Vitamin B1:	10 mg daily for 6 weeks	
4. Folic acid:	5 mg on day 1 and then 5mg/week for 3 months	
5. Zinc supplements:	< 6 months of age: > 6 months of age:	1/2 tablet of 20 milligram per day for 14 days 1 tablet of 20 milligram per day for 14 days and minerals (magnesium, copper) if available.
6. DO NOT GIVE IRON OR ANTIWORM MEDICATION UNTIL PHASE 2		
7. Check if vaccinations are up-to-date. If not, vaccinate.		

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. Start with the same quantity (cc) of HEM as in Phase 1, but use PHASE 2 – HEM.
(this solution contains more calories than the PHASE 1 HEM) How to prepare HEM Phase 2: **see BOX 5**.

2. If the child finishes the meal, **increase the size of the next meal by 10 ml**. Slowly add other foods. The amount of HEM and other foods can be increased according to the appetite of the child. For a schedule of meals spread over 24 hours, **see BOX 6**.

The child should still be fed day and night.

3. The child should gain 10-20 g 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, AIDS, thalassaemia, cardiac disease, hepatitis B.
- Check for infections, such as diarrhoea, pneumonia, UTI, parasitic infection.

Continue medicine treatment started in Phase 1, deworm and start iron. (**see BOX 7**).

4. When the child reaches -2 Z scores W/H and stays at least -2 Z scores for 2 consecutive weeks, no longer has oedema, and is free from infection: refer to OPD for the Supplementary Feeding Programme (SFP).

BOX 5

PHASE 2 - HIGH ENERGY MILK (HEM)	
Number of meals	6 meals per 24 hours
Time of meals	6 meals = every 4 hours
Volume per meal	= 200 cc x body weight (kg) / number of meals per 24 hours.

HOW TO MAKE PHASE 2 - HIGH ENERGY MILK (1 L)

Ingredients and Amounts:		**Instructions:**
Dried skimmed milk	80 g	Boil water for 5-7 minutes.
Sugar	50 g	Mix all the ingredients in boiled water.
Vegetable Oil	60 g	Cool and use with cup.
Boiled water (or fill to 1 L)		Add vitamin and mineral mix if available (UNICEF).

DO NOT STORE AND RE-USE HEM – IT CAN CAUSE DIARRHOEA

BOX 6

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

BOX 7

TREATMENT

1. Continue with Folic Acid, vitamin B_1 and Zinc supplements.
2. **Mebendazole** 100 mg BID x 3 days (or Albendazole - see dosage chart).

Add **ferrous sulphate** after 2 weeks of admission or when the child moves into Phase 2.

< 5 kg:	50 mg OD for 3 months
5-9 kg:	100 mg OD for 3 months
> 10 kg:	200 mg OD for 3 months.

SEVERE ACUTE MALNUTRITION IN ADOLSECENTS AND ADULTS

Moderately malnourished adolescents and adults are not normally admitted to feeding programs unless they are severely malnourished and in poor clinical condition.

Adolescents and adults may present with severe malnutrition, indicated by low weight for height:

DIAGNOSIS

Adolescents:	**<70% median weight for height** (see appendix) **or are in a poor clinical condition** (for example): • Bi-lateral oedema not attributable to other causes. • Clinical marasmus – extreme thinness. • Night blindness. • Extreme pallor (paleness) – severe anaemia. • Vitamin and mineral deficiencies.
Adults:	**BMI is less than 16** (see appendix or calculate: weight (kg) / height2 (m)) The person is thin and has bi-lateral pitting oedema.
Pregnant and Lactating Women:	**MUAC <170 mm**

These people are **malnourished** and need therapeutic feeding.

MANAGEMENT

PHASE 1

The feeding supplements used are the same as that of therapeutic feeding for children in **Phase 2**, but the amounts are different. Feedings should be frequent (at least 6 meals per day). For the volume of meals, see **BOX 8**. Vitamins and antibiotics should be given to all malnourished people. For systematic treatment see **BOX 9**.

BOX 8

PHASE 2 - HIGH ENERGY MILK	
Number of meals	6 to 8 meals per 24 hours
Time of meals	6 meals = every 4 hours 8 meals = every 3 hours
Volume per meal	depends on the age of the patient:
7-10 year	135 cc x total bodyweight/number of meals per 24 hours
11-18 year	65 cc x total bodyweight/number of meals per 24 hours
18-75 year	55cc x total bodyweight/number of meals per 24 hours
>75	45 cc x total bodyweight/number of meals per 24 hours

BOX 9

SYSTEMATIC TREATMENT

The same as for severely malnourished children (see **BOX 4**):

- Broad-spectrum antibiotics.
- Vitamin A as single dose (for children >1 year 200 000 IU).
- Vitamins as for malnourished children.
- WHO has no recommendation for de-worming in adolescents or adults.

PHASE 2

Start Phase 2 when appetite returns.

Patients may feel very hungry, so offer plenty of local foods in addition to the HEM.

➔ 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.

For a schedule of meals spread over 24 hours, **see BOX 10**.

BOX 10

PHASE II HIGH ENERGY MILK + LOCAL FOOD

TIME	EXAMPLES OF MEAL – 6 HEM MEALS
6 am	PHASE 2 HEM
8 am	LOCAL MEAL – rice + tinned fish + AsiaMIX cookies
10 am	PHASE 2 HEM
12 pm	LOCAL MEAL – rice + beans + vegetable
2 pm	PHASE 2 HEM + banana
6 pm	PHASE 2 HEM + LOCAL MEAL – rice with egg and vegetables
10 pm	PHASE 2 HEM
2 am	PHASE 2 HEM

SYSTEMATIC TREATMENT SEE BOX 4

Adolescents and adults can be discharged when they are eating well, are gaining weight, are free of infection and when:

- Adolescent: ≥80% median for 2 weeks and good clinical condition.
- Adult: BMI ≥16 and good clinical condition.
- Pregnant and Lactating Women: MUAC ≥16 and good clinical condition.

17.2 VITAMIN DEFICIENCIES

Vitamin A deficiency

See the Burma Border Primary Eye Care Manual for more detailed information on vitamin A deficiency.

DEFINITION

Vitamin A deficiency is 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'), 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

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

Children less than 6 months			**Children age 1 year and older (or >8 kg)**		
Day of diagnosis	(D 1)	50,000 IU	Day of diagnosis	(D 1)	200,000 IU
Next day	(D 2)	50,000 IU	Next day	(D 2)	200,000 IU
One week later	(D 8)	50,000 IU	One week later	(D 8)	200,000 IU
Children between 6 and 11 months (<8 kg)			**Women of reproductive age**		
Day of diagnosis	(D 1)	100,000 IU	10,000 IU OD for two weeks		
Next day	(D 2)	100,000 IU	(or 25,000 IU once a week) **FOR 8 WEEKS**		
One week later	(D 8)	100,000 IU			

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.

REFERENCES

Malnutrition (**17.1**), eye diseases (**11**), diarrhoea (**12.1**), respiratory infections (**21**), measles (**15.3**).

Vitamin B1 deficiency (Beriberi)

DEFINITION

Vitamin B1 deficiency occurs when there is not enough vitamin B1 in the body due to an insufficient diet. This disease is prevalent on the Thailand/ Burma border, especially in pregnant and lactating women and their babies. The disease may present in different ways, known as 'Dry Beriberi,' and 'Wet Beriberi,' or in combination. Most vitamin B1 deficiency seen on the border is mild.

1. VITAMIN B1 DEFICIENCY 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

For mild deficiency (Mild dry Beriberi)

- **Vitamin B1** PO 100 mg OD x 7 days.
  then 10 mg OD x 6 weeks.

For severe deficiency
(Wet Beriberi and Dry Beriberi with severe signs)

- Admit to IPD.
- **Vitamin B1** IM 100 mg TID for 1 day, then:
- **Vitamin B1** PO 100 mg OD x 7 days.
  then PO 10 mg OD x 6 weeks.

Consider giving **B-Complex** or **multivitamins,** as other B vitamins may be deficient in the patient as well.

Advise patients not chew betel-nut or lepetho when taking vitamin B supplements: betel-nut destroys the vitamin B1

Note: take vitamin B1 tablets 1 hour before meals.

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).

17.3 OBESITY

DEFINITION

An obese person is too heavy for his/her height compared to standard weight tables. Obesity is usually caused by eating too much food (and therefore taking in too many calories), and/or doing little or no physical activity. Obesity is rarely caused by disease although in very few cases, obesity can be caused by endocrine disorders or medication. Obesity is a risk factor for many diseases (e.g. cardio vascular diseases, gallstones, arthritis or diabetes mellitus).

DIAGNOSIS

For adults, the international definition of obesity is a Body Mass Index (BMI) >30 (see BMI table in the appendix at the end of these guidelines). **Note**: For pregnant women you cannot use the BMI table, instead use the Mean Upper Arm Circumference.

In our region a BMI >27,5 is defined as high risk factor for related diseases.

MANAGEMENT

Provide advice on eating properly and taking exercise:

- Take smaller amounts of food at each meal, and eat meals that contain moderate amounts of oil. Do not eat the fat from meats. Eat plenty of beans, fruits and vegetables, and drink plenty of water.
- Avoid snacks, such as sweets, fried snacks, sweet drinks, etc. Avoid alcohol.
- Take exercise for at least 30 minutes every day (such as walking, playing football, gardening, etc.)

Be careful when prescribing drugs to obese people. For certain medication you may need to change the dose.
See drug doses at the end of these guidelines.

18 MENTAL HEALTH

In general

Many psychiatric disorders do not have obvious signs and symptoms. Alcohol abuse, for example, may be a symptom of depression, anxiety or trauma. Disorders of mental health (mood, thinking and behaviour) may be due to a psychiatric diagnosis, a personality disorder or to physical disorders. Before you diagnose a mental health problem, you should exclude underlying physical diseases or 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 obtain a detailed medical history.

Many mental health problems should not be treated with medication alone. Drugs should be combined with counselling. In paragraph 5 you can find more information about counselling. During pregnancy and breastfeeding, mental health medication should be stopped or lowered to the lowest effective dose.

The following are the more common psychiatric disorders.

18.1 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 episode.

Five or more of the following symptoms, including a depressive mood or loss of interest, characterises a depressive episode:

- 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.
- 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 psychomotoric 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.
- Less need of sleep.
- Talking very quickly.
- Vivid thoughts.
- Easily excited.
- Increased activity (social, sexual)
- Seeks out pleasurable activities.

These symptoms must be present for **at least one week** before diagnosing a manic episode.

TREATMENT

Non-medication treatment options:

- Counselling (**see below 18.5**).
- Encourage the patient to keep active, get up at regular times and do plenty of physical exercise.

Treatment by medication

Depressive disorder

- Selective Serotonin Reuptake Inhibitor (SSRI):
  e.g. Fluoxetine, tablets of 20 mg. Normal dose 40 mg a day. This treatment must be maintained for 6 months.

  Keep in mind that 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. Advise the patient to take this medication in the morning, as it can influence sleep patterns.
  Side effects: Weight gain, sweating, and occasional mild neurological signs such as tingling in the fingers.
  Note: in the first few weeks of SSRI treatment the suicide risk is increased. For patients with severe depression Diazepam (5 mg TID for 2 weeks) may be added to the treatment.

- If you do not have SSRI, or if the SSRI is not effective after 8 weeks, stop SSRI and give the patient a Tricyclic antidepressant (TCA) e.g. Amitriptylline. A normal dose is between 75 or 150 mg a day. If possible, obtain regular amitriptyline blood levels from the patient. Note: do not give large amounts of TCAs to a patient undergoing unsupervised treatment.

- If the above medication is not effective, refer the patient to a hospital where mental health care is provided.

- If a patient with a depressive disorder has severe sleep disturbances Diazepam (or Oxazepam) 5mg oral may be given for a short period of time.

Manic disorder

Manic disorder must be treated in a psychiatric hospital, because patients on this type of medication (lithium, valproate etc) must have their blood levels monitored regularly to prevent catastrophic side effects.
For an acute episode, if the patient has not been admitted to hospital, it is possible to administer a sedative drug, like Diazepam or Oxazepam. Or you treat them like you would treat a person with an acute psychosis (see below).

18.2 ANXIETY DISORDERS

DEFINITION

Anxiety or mental stress often occurs when we are frightened or afraid. Anxiety disorders are defined when acute anxiety overwhelms the psychological functioning or when anxiety is persistant. When feeling anxiety or stress, the heart usually starts beating faster, reactions are quicker and we are more alert. This is the body's normal reaction to stress, but problems occur when levels of stress are too high or are unable to be relieved.

- A normal reaction to psychological stress is headache, feeling uptight and nervous. When these symptoms become chronic you could speak of anxiety disorder. More severe symptoms from unrelieved anxiety can include sleeplessness, heart palpitations, depression, violence, withdrawal and psychosomatic complaints.
- Psychosomatic disorders: these occur when a person is unable to deal with increasing levels of mental stress or tension. 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 pain, numbness, 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.

TREATMENT

Try to calm down the patient by personal talking and listening carefully and reassuring.
Always look for an underlying mental disorder (depression, PTSS or psychosis) and give specific treatment.

Treatment options by medication:

- For an acute anxiety attack you can use diazepam (5-15 mg PO in divided doses for a maximum of 2 weeks) to lower the anxiety.
- For long-term treatment, other medication is needed.
- Very much used as medications are the SSRI, of which fluoxetine is one of them. The doses are most of the time equal to the treatment of a depression: 40 mg a day
- Other treatment options by medication are difficult because they need blood level monitoring.

Other 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 below).

18.3 POST TRAUMATIC STRESS DISORDER

DEFINITION

- Post Traumatic Stress Disorder (PTSD) is a condition that occurs as a response to extremely frightening, severe and prolonged fear. It is characterised 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.

CAUSE

- Life threatening violence, either a single event or over a long period of time.

- Violence experienced either directly by the patient or seen by the patient to have happened to somebody else.
- Escaping from possible violence, or fear of capture.

SIGNS AND SYMPTOMS

- Affecting a person's ability to enjoy life and interact with others.
- Withdrawal (little or no communication with others).
- Panic attacks (episodes of sudden fear occurring for no apparent reason).
- Often: vague symptoms such as headaches, sleeping problems, joint pain, fatigue, irritability, irrational fear, and flattened or inappropriate mood.
- Personality changes, violent outbursts, poor concentration.
- Disturbed sleep patterns.
- Chronic physical symptoms; psychosomatic complaints that are not relieved by symptomatic medical intervention; frequent visits to medical facilities.

TREATMENT

Non-medication treatment options:

- Counselling (see the following section on counselling).
- Relaxation therapy.
- 'Survivors of violence' need to feel safe and secure in their environment.
- Empathy: listen and accept what the person is saying. Ask how they feel about the incident, express your support.
- Talk and listen, ask the patient about the history of their problems. For example, when was the first time they felt the headaches, or could not sleep? What things were happening in their lives around that time? Try to locate a probable cause for their symptoms.
- Try to listen to the patient's problems. Do not to judge them based upon their stories, express that you are interested in what they have to say and try to let them express themselves. Above all, let the patient know they are not alone and that you understand the reasons for their stress.

Treatment options by medication:

- Consider SSRI like fluoxetine.
- When the patient is suffering from nightmares, a low dose of haloperidol (1-2 mg) could be very helpful. For other sleeping disturbances, you can use benzodiazepines (e.g. diazepam 5 mg oral). However, diazepam is an extremely addictive medicine, so diazepam should not be prescribed for more than 1-2 weeks.

18.4 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 where one has the experience of hearing, seeing, smelling and even feeling things that are not there, i.e. 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 posses e.g. the patient may claim to be able to read peoples' minds, or claim to be from another planet. Delusions are generally so strange that many peoples' first reaction is to laugh. However, 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 i.e. that they are in hospital and they will receive treatment.

TREATMENT

For acutely psychotic patients, phenergan 25mg + haloperidol 5mg orally or by IM injection (both medications can be administered together in the same syringe).
Monitor these patients closely as these medicines have severe and distressing side effects. Long term medical management needs to be tailored individually to the patient and should only be prescribed by experienced medical personnel. Treatment should include counselling, psychotherapy and social support.

SIDE EFFECTS

- Parkinsonism:
  Tremors, Stiffness, Akinesia (inability to initiate movement) or Bradykinesia (slow movements), Postural instability (feel unsteady).
- Occulogyric crisis (eye rolling movements): especially in young men.
- Torticollis (neck twisting movements): especially in young men.

When a patient has symptoms of parkinsonism, the dose of haloperidol treatment is too high: lower the dose.
The side effects are treatable by biperiden (Akineton) 2 mg tablets, 1-3 doses a day.

18.5 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 a long 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 display 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:

Square:	Sit facing the person, do not sit sideways to them, and look directly at them.
Open:	Sit with an open posture, do not cross your arms or lower your head.
Leaning forward:	By leaning slightly forward towards the person you are showing them that you are interested.
Attentive:	Be attentive to what they are saying, listen to them and nod your head to show you understand.
Relaxed:	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 begin with

Explain that you want to help them, introduce yourself and your profession (medic, social worker). 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. Find a quiet, comfortable and private environment to talk.

2) Family history

Life story - how did you come to camp? What happened to you while in Burma? Why did you come to Thailand?
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 interfere with 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, determine 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? i.e. when relating 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, 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.

DO NOT TRY TO DO TOO MUCH DURING THE FIRST SESSION.

5) Referral

The counsellor may need to decide whether or not the person needs a referral to another service on camp. 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 and to strengthen the person, 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.

OBSTETRIC PROBLEMS 19

For more detail, the following obstetric guidelines are available on the border:

- **ARC**: Reproductive and Child Health Clinical Guidelines, Burma Border Edition;
- **SMRU**: Obstetric Emergencies;
- **WHO**: Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors.

19.1 BLEEDING IN EARLY PREGNANCY

Bleeding before 22 weeks

Abortion

DEFINITION

Spontaneous or induced termination of pregnancy before 22 weeks. Bleeding in early pregnancy can be divided into threatened abortion, complete abortion, incomplete abortion and septic abortions. All have different therapies.

ALWAYS CARRY OUT A SPECULUM EXAMINATION AND BIMANUAL VAGINAL EXAMINATION.
LOOK FOR PRODUCTS (PLACENTA AND FOETUS).
REMOVE ALL PRODUCTS IMMEDIATELY IF IN THE CERVIX.

Note: for all cases, ultrasound examination (if available) could help you making the correct diagnosis.

Threatened abortion

DEFINITION

'Threatened abortion' is a pregnancy before 22 weeks where there is bleeding and/or cramping.

SIGNS AND SYMPTOMS

- mild vaginal bleeding, no shock.
- mild cramping abdominal pain.
- no products passed.
- cervix closed.

TREATMENT

1. Patient rests in IPD until the bleeding stops.
2. Advise the patient to return to clinic if bleeding returns.

Complete abortion

DEFINITION

A complete abortion is where all the products of conception have been lost from the uterus.

SIGNS AND SYMPTOMS

- Vaginal bleeding.
- Abdominal cramps.
- Complete passage of products seen.

Bleeding reduces after abortion, the cervix closes and the uterus becomes smaller and non tender.

TREATMENT 1. Rest in IPD. 2. Paracetamol for pain. 3. Check Hb next day.

Incomplete abortion

DEFINITION

An incomplete abortion occurs when tissue has been passed, but some products of conception remain in the uterus.

SIGNS AND SYMPTOMS

- vaginal bleeding; may have shock.
- abdominal cramps.
- some products passed.
- you may see products in cervix.
- the cervix is open.

TREATMENT

1. Remove all products from cervix using sponge forceps or a vacuum aspirator.
2. If unable to remove all products or bleeding is heavy and continuous:
    - Place IV line, give IV NSS/RL/Haemacel (**see Shock section, 7.6**).
    - Consider transfusion.
    - Give **Oxytocin** IV 10-20 IU, **Misoprostol** (if available) **or Ergometrine** IV/IM 0.2mg.
    - REFER for curettage.

Missed Abortion

DEFINITION

A missed abortion occurs when the embryo or fetus has died, but an abortion has not yet occurred.

SIGNS AND SYMPTOMS

- Little or no bleeding.
- The cervix is closed.
- Uterus is smaller than expected.

TREATMENT

- Most missed abortions will abort spontaneously.
- If available misoprostol can be given per vaginam to induce abortion.
- The patient may need referral for curettage if products remain in uterus beyond one month.

Septic abortion

DEFINITION

A septic abortion occurs when the tissue from a missed or incomplete abortion becomes infected. The infection can spread very easily through the body and is a high risk to the life of the woman.

SIGNS AND SYMPTOMS

- Manage the same as an incomplete abortion plus:
- Fever.
- Shock.
- Vaginal discharge, bad smell.
- Cervix tender.
- Pelvic pain.

TREATMENT

- Manage the same as incomplete abortion plus:
- Tetanus injection if not given during pregnancy.
- 7-10 days of antibiotics (start antibiotics before curettage):
  - **Ampicillin** IV 1g QID AND **gentamicin** IV/IM 7mg/kg OD [max 360 mg] **AND**
  - **Metronidazole** PO 500 mg TID.
- Switch to oral **amoxicillin** and **metronidazole** when clinically better.
- If you suspect STI, **see treatment on 13.5**.

Ectopic pregnancy

DEFINITION

The foetus grows outside the uterus, usually in the fallopian tube. After a few weeks (typically 8 weeks but it may be before or after), bleeding starts and the tube may rupture (break). Rupture causes very dangerous bleeding and shock, with high risk of death.

SIGNS AND SYMPTOMS

- Positive pregnancy test.
- Lower severe abdominal pain, usually one-sided.
- Slight bleeding which may be very dark in colour.
- The patient may suffer shock.
- There may be minimal external bleeding, because the bleeding is internal.
- Vaginal examination: tender cervix or to one side of the cervix.

DIAGNOSIS

Clinical, or when ultrasound is available: positive pregnancy test and no fetus in the uterus.

Always suspect Ectopic if a woman has lower abdominal pain in early pregnancy

TREATMENT

- Start IV NSS or Ringer.
- Blood transfusion may be needed if heavy bleeding.
- **REFER for surgery urgently.**

Hydatidiform Mole (also known as Molar Pregnancy)

See below 19.6

19.2 BLEEDING IN LATE PREGNANCY

(APH: ANTEPARTUM HAEMORRHAGE) Bleeding after 22 weeks

Bleeding in late pregnancy is an alarm symptom: be alert.

The most common causes are:
1. PLACENTA PRAEVIA (all or part of the placenta is covering the inside opening of the cervix).
Usually = Painless bleeding.

2. PLACENTAL ABRUPTION (separation of the placenta from the uterus wall).
Usually = Severe pain, hard uterus and absent foetal heart sounds (foetal heart beat could be normal in a small abruption).

In case of placenta praevia, do **not** bimanually examine the patient because there is a risk of breaking the placenta or disconnecting it from the uterus. Carry out a careful speculum examination instead: look for the placenta or umbilical cord protruding from cervix.

TREATMENT

- Admit to IPD.
- **Immediately insert a large (16-18 G) IV cannula and give IV NSS or Ringers (and blood if shocked).**

1. If bleeding reduces or stops AND uterus is soft AND foetal heart-beat is good (>120 bpm):
   - Keep in IPD and discuss referral with midwife or doctor.
   - This is not an emergency, but referral will be needed for ultrasound to check for placenta praevia.
   - If gestation is less than 34 weeks, give dexamethasone (see 19.2 Premature labour).
   - Do NOT discharge a woman until she has stopped bleeding for a minimum of 24 hours.

2. If bleeding is severe OR the uterus is hard OR there are no foetal heart sounds:
   - REFER immediately with IV line and fluids.

3. If the cervix is well dilated and the patient is close to delivering:
   - Continue with delivery in the clinic.

19.3 BLEEDING AFTER DELIVERY

(PPH: POST-PARTUM HAEMORRHAGE) Blood loss of > 500 ml

PPH IS THE LEADING CAUSE OF MATERNAL DEATH WORLDWIDE

The most common causes are:

1. UTERINE ATONY The uterus is soft not well contracted. This may occur after twin or grande multi-para delivery, after prolonged use of oxytocin or it may be a sign of uterine rupture.
2. RETAINED PLACENTA A piece of placenta remaining inside the uterus.
3. LACERATION (TEAR) OR HAEMATOMA A rip or tear, especially of the cervix or a vaginal blood vessel.

Always examine the placenta carefully to see if it is complete.

Treat for PPH if

- The patient's sarong is wet from blood within 5 minutes after delivery.
- There is constant trickling of blood.
- Blood loss is more than 250 cc and there is continual severe bleeding.
- The patient delivered outside the hospital and still bleeding on arrival.

TREATMENT

PPH IS AN EMERGENCY, DO NOT WAIT AND SEE

General

- Ask for help. Give oxygen and put legs up (Trendelenburg position)
- Give Syntocinon 10 IU IM and massage (rub) uterus to make it contract until it is hard.
- Immediately insert one or two large (16-18 G) IV cannulas and give IV NSS 500cc with 20 IU **Syntocinon (Oxytocin)** at 30 drops/min. Give plenty of fluids; see **hypovolemic shock** (**7.6**).
- Insert a urinary catheter and monitor fluid balance.
- Check and record BP, pulse and uterus contractions every 5 minutes.
- Take Hb/Hct and blood group for possible transfusion.

Placenta NOT delivered

- When the uterus is hard, deliver the placenta by controlled cord traction.
- If this is unsuccessful and the patient is still bleeding, manual removal of placenta is needed.
- If you cannot perform a manual removal, or if you are not successful (i.e. placenta accreta), then **refer** the patient.
- Give antibiotic prophylaxis (amoxicillin and metronidazole).

Placenta delivered and complete

- Massage the uterus to express any clots, and continue until the uterus is hard. Continue to check the uterus to be sure that it remains firm.
- If the uterus remains soft, give methergyne 0.25 mg IV (slow) (if the woman had high BP, give only Synto).
- Continue IV fluids with **NSS** 500cc with 20 IU **Synto** 15 drops/min.
- Consider **misoprostol** rectally if available.

Placenta is delivered, but INCOMPLETE

- Perform a manual exploration of the uterus to remove placenta pieces.
- If you are unable or unsuccessful, **refer** the patient for curettage (scrape of the inside of the uterus).
- Give antibiotic prophylaxis (amoxicillin and metronidazole).

Lacerations (tears)

- **Look for bleeding** from a tear (perineum, vagina or cervix).
- Apply sponge forceps or pressure to stop the bleeding, then suture. After repair, check there is no further bleeding. A 3rd degree tear (including the anus) should be repaired by a doctor, or **refer**.

If still heavy bleeding

- Remember the need to **replace the lost blood** plus the ongoing bleeding.

- Insert a second large (16-18 G) IV cannula for IV **NSS/Ringers plus haemacel**.
- Continue IV fluids with NSS 500cc with 20 IU **Synto** 15 drops/min.
- Give a **blood transfusion**, but do not delay **referral** by waiting for the transfusion.
- Bimanual and or aortic compression for uncontrolled bleeding.
- REFER.

Note:
➔ Loss of <500ml of blood at delivery is NORMAL BLEEDING.
➔ Slight bleeding for a few days after delivery is normal. It should be like a normal period, decreasing over one week.

19.4 THREATENED PREMATURE LABOUR

Contractions start before 37 weeks

GENERAL

- The management of this condition depends on the gestational age and the progress of labour.
- Always look for an infection. For example: malaria, UTI, ARI or typhoid can cause premature labour.

TREATMENT

- Treat any infection you find according to the guidelines. Treat the fever with paracetamol.

(a) < 28 weeks:

If the baby is born it may be too premature (young) to survive.

- Consider stopping contractions by using nifedipine or salbutamol (see below).

(b) 28-34 weeks AND cervix < 4cm AND membranes not ruptured

Try to stop the labour:

- Bed rest.
- Give **nifedipine** 20 mg STAT, if still contracting one hour after this dose (> 2 times in 10 mins and more than 20 secs) give a further dose. Then give **nifedipine** 20 mg TID for 72 hour to stop the contractions.
  Note: do not give nifedipine if the patient has low BP or has a heart problem.
  If no nifedipine available consider indomethacin, or terbutalin (discuss with doctor)
- Give **Dexamethasone 24 mg in 24 hours** (8 mg IM TID for 1 day) or **betamethasone** (12 mg IM OD for 2 days) to help the baby's lungs to mature. This takes 48 hours to work. If contractions and cervical dilatation increase, stop dexamethasone and prepare for delivery. Note: do not continue dexamethasone after delivery.

(c) > 34 weeks or cervix > 4cm dilated or membranes ruptured

DO NOT try to stop the labour.

- Prepare for the delivery of a premature baby.
- In case of a **premature rupture of membranes** (the water bag leaking before 37 weeks of gestation), no progress of labour AND no sign of infection:
  - Give oral **erythromycin** (500 mg QID for 7 days) to prevent infection of the mother and the fetus.
  - During labour, give prophylactic antibiotics: **ampicillin** 2 gram IV QID until delivery.
  - When signs of infection in the mother use ampicillin, gentamicin and metronidazole.
  - If rupture of membranes before 34 weeks also give dexamethasone. Induce labour at 37 weeks of gestation.

- See neonatal guidelines (**appendix 24**) for baby care.

19.5 PRE-ECLAMPSIA & ECLAMPSIA

Pre-eclampsia and eclampsia are syndromes found at the late stage (>20 weeks) of pregnancy. These conditions can remain until, or even start after, delivery. Eclampsia is very serious and there is risk of maternal and child death. It is very difficult to predict whether pre-eclampsia will become eclampsia so it is essential to be very cautious.

High Blood Pressure (HBP) during pregnancy = >140mm Hg systolic and /or >90 mm Hg diastolic
OR
An elevation of 15 mm Hg diastolic from the previous visit during pregnancy

DEFINITION

1. Pre-Eclampsia

- HBP>140/90 AND
- Protein in the urine (urine stick) OR
- Oedema (legs, hands, face; sudden weight gain; oedema may be present but is not required to make the diagnosis of pre-eclampsia).

Between 20 wk of pregnancy and 6 weeks post-partum.

2. Severe Pre-Eclampsia

- HBP > 160/110 AND
- 3+ proteinuria (urine stick) OR
- Marked oedema may be present

Between 20 wk of pregnancy and 6 weeks post-partum.

Headache, upper abdominal pain and blurred vision are symptoms indicating the severity of the pre-eclampsia and can quickly develop into eclampsia. Hyperreflexia is a sign of severity.

3. Eclampsia

- Pre-eclampsia + convulsions or coma.

4. HELLP syndrome

- Haemolysis (break down of red blood cells).
- Elevated liver enzimes.
- Low platelets.

RISK FACTORS

- First pregnancy (primipara).
- Age> 35.
- Twins.
- History of HBP.
- History of Pre-eclampsia in previous pregnancy.
- Hydatidiform mole.
- Too much amniotic fluid (polyhydramnios).

WHEN A PATIENT WITH SYMPTOMS OF PRE/ECLAMPSIA PRESENTS TO OPD

- Check the past medical history and history of previous pregnancies for HBP.
- Check the Antenatal Card for previous BP.
- Ask about symptoms of oedema, headache, blurred vision and abdominal pain.
- Ask about foetal movement, vaginal bleeding and uterine contractions.
- Look for oedema and hyperreflexia.

TREATMENT

Pre-Eclampsia

If less than 37 weeks of gestation:

- Admit to IPD and check BP regularly.

- Start **methyldopa (aldomet)** 250 mg PO BD-TID and increase progressively to 750mg PO TID (max 3 gram). Note: methyldopa is slow acting. It will take 2 or 3 days for the drug to have full effect.
- If rest AND methyldopa do not control the BP in 7 days:
  Add **nifedipine** 20 mg BID and increase progressively to a max 60 mg/day;
  Or **propranolol** 40 mg PO BID (if no nifedipine available), increase progressively to a max 360 mg/day.
- Do NOT use diuretics (furosemide or hydrochlorothiazide).
- Discharge when BP normalises and there are no symptoms: advise the patient to return twice weekly for a follow-up of BP and a weekly urine stick. Explain to the patient about the danger signs of pre-eclampsia (headache, blurred vision, abdominal pain etc).

If more than 37 completed weeks start methyldopa and start induction of labour.

If less than 34 weeks give **dexamethasone** (**see 19.4**) and **methyldopa**. Consider **referral**.

Continue medication until after delivery and then slowly reduce dose if BP is normal

Severe Pre-Eclampsia:

The treatment of severe pre-eclampsia is **delivery** by the quickest method.

- Start IV with normal saline or Ringer to hydrate the patient (2-3 lt/24 hours).
- Start **magnesium sulphate** if available.
- If BP> 180/110 start **hydralazine** IV 5 mg.
  Note: Be careful, hydralazine can reduce BP very quickly and the patient may go into shock (therefore a test dose of 2,5 mg IV is recommended).
- Refer the patient for delivery as soon as possible.
- If no referral service is available, induce delivery.
- Measure urine output when a patient is on MgSO4 treatment and make sure the hourly urine output is at least 30 cc/hour.

Magnesium Sulphate (MgSO4) 2cc of 50% MgS04 =1 gm MgSO4		
FOR FITTING	loading dose: AND maintenance dose:	4gm (8cc) of 50% Mg SO4 in 72 cc of IV fluid = 80cc Give over 20 minutes, 20cc/5minutes. 5 gram (10cc) into 500cc of D5W and infuse at 100 cc per hour (1gm MgSO4 / hr)
TO PREVENT FITTING		4gm (8cc) IM each buttock. Total dose = 8gm

If you give an overdose of magnesium sulphate, the patient can stop breathing. If this happens, take the following action:

- Stop the magnesium infusion and give 10% **calcium gluconate** 10cc IV over 3 minutes.
- Assist breathing with a resuscitation bag until the patient starts breathing again.

Hydralazine 1 cc = 5 mg
• If systolic BP > 200 and the diastolic BP is > 120: start with 5 mg (1 cc) by slow IV push (over 5 minutes)
• If the BP is < 200/120 start with an infusion: 25mg of hydralazine in 500 cc of Ringer or NSS at 20 drops / min
The rate of the infusion is adjusted to keep the diastolic blood pressure < 100 mmHg. While adjustments to the infusion are being made, the blood pressure needs to be monitored every 5 minutes. Once the BP has been lowered, maintain the infusion at that rate. Continue to monitor the BP 1/2 hourly. If the diastolic BP falls below 90 mmHg, stop the hydralazine infusion. Give plain IV fluids just to keep the line open. Monitor BP 1/2 hourly. If the BP rises (diastolic > 100 mm Hg) restart infusion.
• If there is no hydralazine available and BP is > 180/110 start treatment with oral **nifedipine**. Repeat this dose if BP remains above 180/110.

Eclampsia

- The treatment of eclampsia is first to stabilise the patient, then deliver the baby.
- Follow treatment for severe pre-eclampsia before referring. Give Magnesium Sulphate.
- Refer the patient as soon as the condition is stable.
- Put the patient in a safe position, lying on the left side and prevent injuries.
- Maintain a clear airway for secretions and vomit.
- If no magnesium sulphate available stop persisting convulsions with Diazepam. (Note: Diazepam will cause respiratory depression in the neonate so prepare for neonatal resuscitation after delivery.)
- Put in a urinary catheter and monitor fluid balance.
- If no referral service is available, induce delivery.

Diazepam 1cc = 10mg	
FOR FITTING	10 mg IV slowly, followed by 40 mg in 500 cc of D10W given over 24 hours. If fit again, repeat diazepam 5 mg IV slowly.
Note: Diazepam can cause respiratory depression of the newborn - MgSO4 is the drug of choice.	

Note:

- ➔ 25% of cases **present after delivery**. Apply same treatment.
- ➔ Continue treatment for severe pre-eclampsia and eclampsia for 48 hours after delivery.
- ➔ Do not stop methyldopa, nifedipine or propanolol suddenly. Reduce dose slowly with weekly patient review.

SEVERE PRE-ECLAMPSIA and ECLAMPSIA = URGENT DELIVERY

19.6 HYDATIDIFORM MOLE

DEFINITION

Hydatidiform mole (also called Molar pregnancy) is an abnormal pregnancy due to abnormal growth of the placenta, which rarely develops into a cancer. There is no fetus in a molar pregnancy. Signs and symptoms are usually noticed at 10-16 weeks of the pregnancy.

SIGNS AND SYMPTOMS

- Severe morning sickness (nausea and vomiting) and tiredness.
- Irregular bleeding with passage of vesicles (they look like grapes).
- The uterus is mostly larger than expected for the age of the pregnancy, and soft.
- Absent fetal heartbeat.
- The pregnancy test is positive.
- Symptoms of hyperthyroidism (**see 10.2**): rapid heart rate, restlessness, nervousness, heat intolerance, unexplained weight loss, trembling hands.

TREATMENT

- Refer the patient for ultrasound and curettage (**Note:** curettage in molar pregnancy has a high risk of haemorrhage or uterine perforation. Curettage should not be done without blood for transfusion on standby).
- If patient's condition is unstable, start IV fluids.
- The patient may be severely anaemic and need transfusion.

COMPLICATIONS

- Infection, bleeding and perforation during curettage.
- Disseminated hydatidiform disease (spreading of the molar cells through the body as cancer).

FOLLOW-UP

The patient should be followed-up for one year and a pregnancy test (preferably B-HCG levels) done every 2 months. She should be offered contraception (**see 20.2**) and be advised not to become pregnant for at least one year.

The patient's future pregnancies should be followed closely.
There is an increased risk for a second hydatidiform mole.

20.1 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 after a person has had more than two epileptic seizures. There are many different types of seizure.

If a seizure lasts longer than 5 minutes it is called status epilepticus and needs emergency management
(**see Convulsions 7.2**)

The most common types of seizures are:

GENERALISED CONVULSIONS (generalised tonic clonic seizures)

- 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 can blink, and they can smack their lips together or clench their hands.
- If the patient is still conscious during the crisis, it is not a generalised convulsion but it could be a different type of convulsion.

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. Not all seizures are due to epilepsy: you must consider other diagnoses:

Seizures with fever:	e.g. malaria, meningitis, hyperthermia, encephalitis.
Seizures with or without fever:	e.g. hypoglycaemia, severe dehydration, head trauma, amphetamines, alcohol, renal failure (uraemia).
Seizures in pregnant women:	e.g. eclampsia.
Repeated seizures without fever:	e.g. brain tumour, cysticercosis.

- Every patient presenting with a seizure should have a full neurological examination performed.
- Every patient presenting with a seizure of unknown cause should have an ECG performed, as some cardiac arrhythmias can present as a seizure.

TREATMENT

- **See 'Convulsions' section at Chapter 7.2.**
- Drugs given in order of preference.

Seizure type	Medication to treat	Medication to avoid
Infant (<1year) generalised tonic clonic seizures	Phenytoin Phenobarbitone	Sodium valporate
Child generalised tonic clonic seizures	Sodium valporate Carbamazipine Phenytoin	
Child absence seizures	Sodium valporate	Carbamazipine Phenytoin
Adult generalised tonic clonic seizures	Carbamazipine Sodium valporate Phenytoin	

- 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.
- 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.
- Try to see the same patient every time (i.e. the same medic for the same patient).

Adult drug doses

	Tablet	Starting Dose	Max Dose per day	Most Common Side-Effects	Toxic Effects
Phenytoin	50 and 100 mg	200 mg OD or BID	500 mg	depression, polyneuropathy, acne, swollen gums	double vision, tremor, ataxia, difficulty speaking, changes in behaviour, anaemia
Carbamazepine	200 mg	100 mg BID	2 g	drowsiness, confusion, rash	rash, nausea, double vision, dizziness, low sodium
Phenobarbitone	30 mg	60 mg at night	180 mg	depression, drowsiness, sedation in adults excitation in children confusion in old people	nystagmus, ataxia
Sodium Valproate	200 mg	200 mg TID	3 g	nausea and vomiting, weight gain, ankle swelling	Rarely, liver failure; especially in children < 3 years old

Note: For Children's dose see Drugs Tables.

STOPPING ANTI-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 phenytoin by 50 mg every 4 weeks.
- Decrease carbamazepine by 100 mg every 4 weeks.
- Decrease phenobarbitone by 30 mg every 4 weeks.
- Decrease sodium valproate by 200 mg every 4 weeks.

PREVENTION

- Take long-term epilepsy treatment to prevent new seizures.
- Put the patient in the coma position and in a quiet safe place during an epilepsy attack in order to protect him/her against injury or complications.

REFERENCES

Malaria (**15.2**), Meningitis (**15.1**), Hyperthermia (**7.4**), Encephalitis (**15.3**), Hypoglycaemia (**10.1**), Severe dehydration (**12.1**), Amphetamines (**23.1**), Alcohol (**23.1**), Eclampsia (**19.5**), Cysticercosis (**12.4**).

20.2 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?
- 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.

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 if used **every time** during sexual intercourse.

CONTRAINDICATIONS

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

IMPORTANT

Do not use a condom with vaseline, oil, nystatin or canestan - 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

PREPARATION Most tablets contain a combination of oestrogen (30 µg) and progesterone.

EFFECTIVENESS If used properly the pill is about 95% effective.

CONTRAINDICATIONS

Do not give if:

- The patient is over 40 years of age, or is over 35 years and is a smoker.
- Personal or close family history of stroke or heart attack < 45 years.
- The patient has a history of migraine.
- High BP >140/90 or diabetes mellitus.
- Uterus, breast or liver cancer (or active liver disease).
- Breastfeeding (ask the doctor about progesterone-only Pill for these women).
- There has been no menstruation yet.
- Obese, with BMI (wt kg/ht m2) > 30.
- Taking these drugs: carbamazepine, griseofulvin, phenobarbital, phenytoin, rifampicin.

MOST COMMON SIDE EFFECTS ARE:

Breast tenderness, nausea, weight gain, headaches, depression, some irregular menstrual bleeding.

GUIDELINE

- Before prescribing oral contraceptive pills you must take a full medical history and conduct a full examination, especially to exclude all of the above contra-indications. Take a pregnancy test. Examine the patient carefully to exclude abdominal mass or breast mass. 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.
- Consider the 50 µg or 60 µg oestrogen combined OCP for breakthrough bleeding that persists after 2 cycles (once the following possible causes of breakthrough bleeding have been excluded: cervix disease; retained products of conception; missing pills; drug use e.g antibiotics; and diarrhoea).

What to tell women taking the pill:
1) Take one tablet every day.
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.

Depot Injection

PREPARATION

Each injection of Depot contains 150mg of medroxyprogesterone acetate in 3ml.
Depot contains no oestrogen and can be used for lactating women (it can be given soon after delivery but this may cause heavy bleeding. It is best to wait 6 weeks after delivery and give it then).

DOSE 1 injection of 3ml IM every 3 months. Check pregnancy test before starting Depot.

EFFECTIVENESS Almost 95% effective.

CONTRAINDICATIONS

Do not give if:
- The patient has liver disease.
- Personal or close family history of stroke or heart attack < 45 yrs.
- If >40 years old, diabetes, high BP or obese. Discuss with the doctor.

MOST COMMON SIDE EFFECTS ARE:

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.

IMPORTANT

Make it very clear to the woman when the next injection is due (11-12 weeks).
If >1 week 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.

IUD (Intra-Uterine Device)

This is usually a T-shaped copper device that sits inside the uterus and prevents fertilisation.

EFFECTIVENESS

Very high, at 98% (avoid using the old Nova-T.) The contraceptive is quickly reversible. Ideal contraception for monogamous women who have finished their family but are afraid of sterilisation.

CONTRAINDICATIONS **Do not put in if:** pregnant or when pelvic infection.

MOST COMMON SIDE EFFECTS ARE

Insertion related e.g perforation, unrecognised expulsion – lost threads.

Norplant

PREPARATION

Implants contain a slow-release progestogen in rods (Norplant = 6 rods; Norplant II = 2 rods) placed just below the skin, usually in the medial, upper arm.
Norplant can be used for lactating women (wait until 6 weeks after delivery).
Norplant can be inserted following 1st trimester abortion, immediately insertion is best or up to 7 days.

DOSE

Norplant remains effective for 4 years and Norplant II for 3 years. Take pregnancy test before insertion.

EFFECTIVENESS 95% effective.

CONTRAINDICATIONS

Do not give if:

- Liver disease or breast cancer.
- Personal or close family history of severe arterial disease e.g stroke or heart attack.
- If < 18 or older than 45 years age.
- Abnormal vaginal bleeding.

MOST COMMON SIDE EFFECTS ARE:

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).

CONTRACEPTION AVAILABE FROM REFERRAL HOSPITALS.

Sterilisation

MALE STERILISATION - VASECTOMY.
FEMALE STERILISATION - TUBAL LIGATION.

20.3 GENDER BASED VIOLENCE

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

Gender Based Violence (GBV) is violence against a person on the basis of gender or sex. It includes acts that cause physical, mental or sexual harm or suffering; threats of such acts; coercion; and other deprivations of liberty. The main victims/survivors are women and girls but GBV can affect men and boys. GBV includes sexual violence such as **rape** and **domestic violence**, and other forms of violence. In most refugee camps in Thailand, domestic violence is the most prevalent type of GBV reported.

Definitions and terminology

Consent involves a voluntary agreement, for example: to consent to engage in a particular sexual act. Consenting people must have the mental capacity to understand the consequences of consent. Under international law (Convention on the Rights of the Child) a person under 18 cannot consent to sex. Under Thai Criminal law, the age of consent is 15.

Confidentiality keeping anything the **survivor** tells you to yourself and only share the necessary information with your supervisor and others providing assistance. Keeping confidentiality means you must **never** discuss cases with your family or friends. Only if a survivor agrees to sign **a consent form** 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.

Child Under Thai Criminal law a child is a person under the age of 15 years.

Incident this is the act or event that the **survivor** is seeking assistance with.

Perpetrator is the person who commits the act of sexual or physical violence.

Domestic Violence Can include:

- Rape, attempted rape, (insertion of objects into the vagina or anus).
- Child sexual abuse.
- Sexual assault.
- Domestic violence including:
  - Physical (acts of physical force, for example: punching with intent to harm).
  - Verbal and psychological (shouting, or using words intended to frighten or intimidate, or prolonged silence).
  - Social and emotional (manipulation, isolation, intimidation, shaming).
  - Economic (withholding money, forcing the victim to part with personal income, or preventing the victim from working).

Note: at the health clinic, ANY type of sexual violence is to be treated seriously, even if it is not yet recognised by international or traditional law.

Principles of Care and Service for Survivors of Violence: Survivors have the right to dignity (self respect). This right has been violated by the perpetrator, and must be emphasised and affirmed by all health providers. The **4 guiding principles** below should be followed by health staff whenever dealing with a case of violence:

• Confidentiality • Safety • Respect
• Non-discrimination (same sex health-worker)

Managing GBV Cases

Goal provide an external examination and assessment of the patient to guide medical treatment and referrals.
Objective obtain history (medical, assault), make appropriate referrals, identify and document injuries, treat the patient.

1. Assessment

1a. 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 her if she would like to ask any questions – does she want someone with her during the assessment? Tell her you would like to write down her history and examination so that you can help her. Write a sentence saying that you have the patient's permission to document what happened and ask her to sign it.

1b. Explain that everything she says will be confidential **unless:**

1) She gives her consent to share the information with another person who will help her.
2) Someone is in serious danger- such as suicidal ideas or death threats.
3) It involves allegations of abuse against an NGO, UN staff or Thai Military.
4) The patient is a minor under 15.

Suicidal thoughts

If a patient tells you that she is thinking of killing herself, you must take this very seriously. Ask her if she has specific plans to kill herself. If she does, you may not let her leave the clinic until she has been seen by a Supervisor. This is one instance when you may break confidentiality and inform another person, even if it is against her wishes.

Recognising Domestic Violence

Many women are reluctant to report domestic violence. Make it clear to the victim that she has the right to live without violence and that there are people in the camp who can try to help her.

2. Medical Treatment and Documentation

DOCUMENT ALL FINDINGS CLEARLY AND COMPLETELY IN WORDS AND DIAGRAMS

2a. Physical Examination

A physical examination should include:

a) Vital Signs (temperature, pulse, respiration and blood pressure) and pain assessment.

b) Observation of general appearance and behaviour: state of clothing, state of nourishment, overall impression.

c) Head to toe assessment of major body systems utilising the techniques of inspection, auscultation, palpation, and percussion. Look carefully for injuries or patterns of injuries and document them carefully (a drawing of a body map – back and front is useful). Do an assessment from head to toe looking for any injuries (even minor), scratches, abrasions bruises, rope or cloth burns, bite marks, hair pulling, swelling, pain, tenderness, defensive injuries (wounds to the backs of the forearms), attacker's skin under nails.

Do not do a pelvic examination. If there is a slight tear because of the violence, repair as appropriate.

2b. Prescribe necessary medical treatment

a) Wounds and fractures: clean and dress appropriately or refer to nearest hospital: tetanus prone wounds will need a tetanus booster (**see 22.4**).

b) All rape victims should be treated for STD, HIV, Hep B and pregnancy immediately:

- **STD prevention**: **ceftriaxone** 125 mg IM STAT; **metronidazole** 2 g STAT; **azithromycin** 1g STAT OR **doxycycline** 100 mg BID 7 days (**see 13.5**)
- **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) (**6**). Every clinic needs one or two PEP packs ready to give to rape victims (Note: check the use by date).
- **Hepatitis B** If the patient has not already been vaccinated, give immunisation with **hepatitis B vaccine** (HBV) as soon as possible if available. Advise her to finish the course. HBV1: as soon as possible (1 ml IM), HBV2 after 1month, HBV3: 6 months after 1st dose.
- **Pregnancy prevention** Take a pregnancy test before giving emergency contraception (EC).
  If pregnancy test positive (+ve), do not give her the pills. Explain to her that this indicates she was pregnant before the rape occurred.
  If she comes within 120 hours (5 days) after the incident and pregnancy test negative:
  Use **combined oral contraceptive pill** containing levonergsterol:
  - First dose = 4 tablets AND Second dose (12 hours after the first dose) = 4 tablets.
  Give **metoclopramide** 10 mg 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.

c) 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.

3. Referral

REFERRALS DEPEND ON THE SURVIVOR'S NEEDS AND MUST BE DISCUSSED WITH THE SURVIVOR.

Health	➔ Refer to the local hospital.
Psychosocial Support	➔ Refer patient for psychosocial support to GBV staff, COERR or women's groups.
Safety	➔ Refer patient to GBV staff, camp security or women's groups.
Legal Justice	➔ Refer patient to the camp justice, Thai authorities or UNHCR.

See next page for GUIDELINES for providing legal information.

4. Follow-up

Schedule a follow-up visit for 2 weeks, 1 month, and 3 months. Record the next follow-up visit.
The following are minimum follow up appointments for survivors. A patient may choose to meet again sooner or more frequently if they choose. 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.

REFERENCES STI (**13.5**), wounds (**22.4**), PEP (**6**)

Guidelines for providing legal information to a patient

Survivors have the option of choosing camp justice or Thai legal justice options. **Refugees are protected under Thai law**. Camp Justice options are available to survivors in each camp. For serious crimes such as rape or serious domestic violence (including attempted murder), camp justice mechanisms are not equipped to deal with these fully. If the patient wants to take legal action outside the camp with Thai law, make sure that they understand the following points clearly.

1. The following incidences are considered a crime under Thai Criminal Law. If she wants to seek legal justice under the Thai system, she can report the incidence to Thai authorities. If someone: touched, kissed, or hugged any part of her/his body that makes her/him feel uncomfortable or annoyed; does the above to her/his son or daughter (under 15 years of age); who is not her husband, forces her to have sex with him; has sexual relationship with her/his daughter, under 15 years of age; causes injuries, threatens, or confines another person

2. When the case is reported to Thai authorities, there will be an investigation. If they find enough evidence to take the trial to court, a judge will determine whether the accused perpetrator committed any criminal offence.

3. The judge will consider statements made by the patient, the accused perpetrator's statements, testimony of witness (if any), and any other evidence (such as body fluids), in order to make decision if the accused person is found guilty or not.

4. Give the following information: they will need to repeat the story; people in the community might know about the case; the legal process is difficult; the accused persons or a relative might pressurise the survivor to stop the legal process; the investigation and trial will take long time; At the end of the legal process, the result might be that the accused perpetrator is not guilty. This does not mean that her story is not true but may be because there is no substantial evidence leading to the conclusion that he committed the crime;
Any survivors who choose to use Thai law will get assistance from UNHCR, including the payment of all legal fees, lawyers and transportation. She will not be alone through the process.

20.4 PALLIATIVE CARE

DEFINITION Palliative care is the support of people who are dying. The aim of palliative care is to maximise the quality of the dying person's life. As a health worker you should keep the patient as comfortable as possible – not just physically. Palliative care is delivered, if possible, where the person wants to be. Family, relatives and friends are usually the main care givers.

Health workers should listen carefully to the patient and caregivers to address what they see are the most difficult problems for them at each visit. You can assist them in palliative care by offering:

Palliative medical care

- **Drugs and materials** are needed.
- A plan for adequate **pain relief** (**see 7.5**). You may need to try different pain medications and work with the patient to see what keeps them free from pain.

- Relief from **other symptoms** e.g. oral/oesophageal thrush – nystatin.
  chronic diarrhoea - opioids (like codein).
- **Support the family** during the patient's illness, for example: provide gloves or materials for dressings. Ask a home visitor to support the patient and/or the family at home.

Psychological support

- 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 - an open and listening health worker can provide a steady, non-judgmental **outlet** for the patient.
- **Confidentiality** is the key to setting up good relationships with the patient and family.

Mobilise community members

Mobilise community members, particularly neighbours, to give the main caregiver some relief from constant duties, 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.

21 RESPIRATORY DISEASES

21.1 UPPER RESPIRATORY TRACT INFECTIONS

Acute Respiratory Infections (ARI): infections of the respiratory system.
Upper Respiratory Tract Infections (URTIs) or Lower Respiratory Tract Infections (LRTIs).

DEFINITION

Upper Respiratory Tract Infections (URTIs) are infections of the upper airways - the ear, nose, throat, trachea and bronchi. Most of these infections are caused by viruses 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 avian flu.

SIGNS AND SYMPTOMS

- General: fever, headache, swollen neck glands, cough.
- Ear: pain, discharge, redness, deafness.
- Nose: discharge, facial pain, inflammation.
- Throat: sore throat, hoarse voice, loss of voice, enlarged tonsils, pus on tonsils.

DIAGNOSIS

on clinical grounds you need to differentiate between MILD – MODERATE – SEVERE URTIs.

Mild URTI

Common Cold

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.

Sinusitis

Sinusitis is an infection of one or more of the sinuses. It commonly happens in patients with a common cold or other viral URTIs. A viral sinusitis can be complicated by a bacterial infection. Patients with a bacterial sinusitis will have more severe and prolonged symptoms of facial pain, headache and generally feeling unwell.

Pharyngitis

Pharyngitis is very common and sometimes a sore throat is the only symptom. It may also be painful to swallow.
Symptoms typically get worse over 2 to 3 days and then gradually go, usually within a week.
Otitis: **see 21.1**.

TREATMENT

- Mild symptoms need no medication. Advise patients to drink plenty of water. Babies should continue breast feeding. **Do not give antibiotics**.

- Treat mild to moderate fever by removing heavy clothing and blankets, tepid sponging and using a fan if necessary. Paracetamol can be given to reduce high temperature and to ease aches, pains and headaches.
- Antibiotics may make symptoms worse as some people develop side-effects such as diarrhoea, nausea and vomiting and rash. Therefore antibiotics are not usually advised for mild URTI if the patient is otherwise in good health.

Moderate URTI

Tonsillitis

Tonsillitis is an infection of the tonsils at the back of the mouth. Symptoms are similar to pharyngitis but may be 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. Consider antibiotic treatment to prevent complications: peritonsilar abscess (see below), rheumatic fever (**see 8.4**), acute glomerulonephritis (**see 13.3**).

TREATMENT

- **Penicillin V** PO (500 mg QID, child: 15 mg/kg QID) for 10 days.
  (Note: shorter courses do not prevent Rheumatic Fever)
  or benzathine penicillin (50.000 IU/kg) IM stat dose if available
  or erythromycin (10 mg/kg QID) if allergic to penicillin.
  Treat the fever and advise the patient to drink plenty of fluids. Continue breast-feeding.

If the patient cannot eat or drink, admit to IPD and give IV fluids and treat with antibiotics as follows:

- **Children** — **Benzathine penicillin** (50.000 IU/kg) IM STAT dose
  or **Benzyl penicillin** (50 mg/kg QID) IV for 10 days
- **Adults** — **Ampicillin** 1 gram QID IV or IM
  or **Benzyl penicillin** 2.4 gram QID IV

Change to **oral penicillin V** (500mg QID) when the patient can swallow. Treat for a total of 10 days.

Croup

Croup is caused by a swelling around the vocal cords that is mostly due to a viral infection, and which leads to breathing difficulties with a 'barking' cough. More severe cases will have respiratory distress. Treatment depends on the severity. Mild croup is self limiting, but breathing the steam from hot water might help (be careful to avoid burns from the hot steam). If there are signs of increasing breathing difficulty, fatigue, blue coloration of the skin, or dehydration: admit to IPD for observation and consider giving steroids and adrenaline in the nebuliser.

Pertussis

SURVEILLANCE
See appendix

Pertussis, also known as whooping cough, is a highly contagious disease that is caused by the bacterium Bordetella pertussis. Pertussis is characterised by initially by mild ARI symptoms. After one to two weeks coughing is followed by an inspiratory 'whooping' sound mostly at night, and vomiting. This disease can be complicated by pneumonia (infants and young children are at greatest risk). Erythromycin

should be administered to the patient and all close contacts to treat and prevent spread of pertussis to others. Make sure the child does not become dehydrated. Pertussis vaccine could prevent severe disease in young children.

Severe URTI

Peri Tonsillar Abscess

Patients with fever, difficulty swallowing and tonsillar swelling on one side need antibiotics (see above section on tonsillitis). Also consider surgical drainage.

Acute Epiglottitis

Epiglottitis is a severe bacterial infection of the epiglottis. Epiglottitis is most common in children aged 2 to 5 years old. The infection usually begins suddenly and progresses rapidly. A previously healthy child rapidly develops a sore throat, and often a high fever. The child breathes quickly, and makes a loud noise while inhaling (called **stridor**). Difficulty breathing often causes the child to lean forward while stretching the neck backward to try to increase the amount of air reaching the lungs. Because of difficulty swallowing, these children dribble a lot of saliva.
Epiglottitis can quickly become fatal because swelling of the infected tissue may block the airway and obstructing air flow. **This is an emergency situation.**

TREATMENT

- Try to avoid upsetting the child.
- Do not hold the child down or use a tongue depressor to look in the throat.
- Give **adrenaline** in nebuliser (5 cc of 1:1000 adrenaline).
- Give **ceftriaxone** IM/IV stat dose.
- EMERGENCY TRANSFER.

Diphtheria

URGENT REPORT
SEE APPENDIX

Diphtheria is an infectious disease spread from person to person by respiratory droplets from the throat through coughing and sneezing. Diphtheria is caused by a bacteria that produces toxins throughout the body. Think of diphtheria when you have a patient with tonsillitis with grey sticky membranes in the throat, enlarged lymph-nodes in the neck, high fever and oliguria. **Refer the patient quickly when diphtheria is suspected.**

TREATMENT

- **Immediate strict isolation. Refer quickly.**
- **Nose and throat samples for culture if available.**
- If strong suspicion start antibiotic treatment

Benzyl penicillin	Adult	2.4 gram QID IV * 14 days
	Child	50 mg/kg QID IV * 14 days
Or **erythromycin**	Adult	1 gram QID oral * 14 days
	Child	15 mg/kg QID oral * 14 days

- 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 0.25 ml SC.
- Observe for further 15 min before injecting the rest IM or IV.

In case of anaphylaxis, give Adrenaline IM:	Infants and children	0.01 mg/kg/injection
	Adults	0.25-0.75 mg/injection

- Close contacts should be treated with **benzyl penicillin** (single dose IM) or **erythromycin** (7 days orally).
- Consult the doctor and refer to the Communicable Disease Guidelines for your site.

Avian Influenza A

Avian Influenza A (H5N1) Infection in Humans

URGENT REPORT
SEE APPENDIX

DEFINITION

Avian influenza, or 'bird flu', is a contagious disease caused by viruses that normally infect only birds and, less commonly, pigs. Avian influenza viruses are highly species-specific, but have, on rare occasions, crossed the species barrier to infect humans. Of all influenza viruses that circulate in birds, the H5N1 virus is of greatest current concern for human health. Over half of the human cases so far have been fatal. There is a risk that the H5N1 virus – if given enough opportunities – will develop the characteristics required to start an influenza pandemic. Transmission is mostly from bird-to-human by inhalation of infectious droplets or by direct contact.

SIGNS AND SYMPTOMS

- fever, muscle pain, headache.
- respiratory symptoms (cough, sore throat and runny nose).
- Diarrhoea.
- Shortness of breath (dyspnoea).
- Clinical pneumonia.

DIAGNOSIS - WHO CRITERIA

- **Suspected H5N1 case**

A person presenting with unexplained acute lower respiratory illness with fever (>38 ºC) and cough, shortness of breath or difficulty breathing.
AND one or more of the following exposures in the 7 days prior to symptom onset:

- Close contact (within 1 meter) with a person (e.g. caring for, speaking with, or touching) who is a suspected, probable, or confirmed H5N1 case.
- Exposure (e.g. handling, slaughtering, defeathering, butchering, preparing for consumption) to poultry or wild birds or their remains or to environments contaminated by their faeces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month.
- Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month.
- Close contact with a confirmed H5N1 infected animal other than poultry or wild birds (e.g. cats or pigs).
- Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting.

- **Probable H5N1 case**

Probable definition 1
A person meeting criteria for a suspected case
AND one of the following additional criteria:
- Infiltrates or evidence of an acute pneumonia on chest radiograph plus evidence of respiratory failure (hypoxemia, severe tachypnea);

OR
- Positive laboratory confirmation of an influenza A infection but insufficient laboratory evidence for H5N1infection.

Probable definition 2:
- A person dying of an unexplained acute respiratory illness who is considered to be epidemiologically linked by time, place, and exposure to a probable or confirmed H5N1 case.

- **Confirmed H5N1 case**

A person meeting the criteria for a suspected or probable case;
AND Positive H5 PCR results from tests using two different PCR targets, e.g. primers specific for influenza A and H5 haemagglutinin.

DIAGNOSIS LAB CBC, chest X-ray, specific viral culture and PCR.

TREATMENT

A suspected or probable patient should be transferred to MOPH referral hospital urgently with all precautions to limit the spread of the disease (use of masks and gloves with minimum handling of patient).

Pre-referral IPD management should ideally follow:
- **Isolation**: keep the patient in strict isolation. No visitors should be allowed in IPD.
- **Treat the fever**, keep the patient well hydrated.
- **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.
- **Antibiotics**: broad-spectrum antibiotics (IV/IM ampicillin and gentamicin) should be given to treat secondary bacterial infections.
- **Steroids** can be used to treat acute respiratory distress.
- **Antiviral drugs**: These drugs are not available on the market due to fear of unnecessary use of drugs leading to drug resistance. But MOPH supplies in case of need.

PREVENTION

early separation, early isolation, hand hygiene (**see universal precautions, 5**).
All attending staff should wear surgical masks, gloves, gown-like outfit to cover the body and if needed, protective goggles. Mass culling of infected domestic birds prevents further spread.

VACCINE There is no influenza A (H5) vaccine available for humans.

REFERENCES Common cold (**21.1**), Pneumonia (bacterial) (**21.2**), Meningitis (**15.1**).

Otitis

DEFINITION

Otitis is an infection of the ear. Otitis can be external (outside ear) or media (inside ear).

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

1. OTITIS EXTERNA

DEFINITION

Skin infection of the ear canal (the outside ear)

SIGNS AND SYMPTOMS

- Pain, external canal red, swollen, sometimes with abscess.
- Drum normal, sometimes fungus in the external ear canal.
- Foreign body (something that should not be there, like a seed) sometimes present.

TREATMENT

- Clean the ears with sterile water or normal saline, especially when there is pus or fluid.
- 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.
- Repeat this local treatment every day until cured (usually 3 to 5 days).
- Treat the fever and the pain (**see 7.4 & 7.5**).
- If no improvement after 5 days, give PO **Cloxacillin.**

2. ACUTE OTITIS MEDIA

DEFINITION

Acute bacterial or viral infection of the middle ear (behind the ear drum).

SIGNS AND SYMPTOMS

- Severe pain (mostly at night), fever.
- Crying, agitation, vomiting, diarrhoea.
- Ear drums: red / bulged (swollen) / perforated with pus discharge.

TREATMENT

- Clean the ears with tissue or cotton wool with sterile water or normal saline in case of pus discharge.
- Treat the fever and pain (**see 7.4 & 7.5**).
- Give **amoxicillin** for 10 days. If the patient is allergic for amoxicillin, give cotrimoxazole for 10 days.

3. CHRONIC OTITIS MEDIA

DEFINITION

Chronic discharge from middle ear with ear drum perforation.

SIGNS AND SYMPTOMS

- Pus discharge for more than 2 weeks.
- No fever, no pain.

TREATMENT

- Apply antibiotic drops (e.g. Cadexcin eardrops), if available, for at least 2 weeks.

- Put small piece of cotton in the ear and ask the mother to change it every 6 hours until the ears dry up.
- If no local treatment is available, use amoxicillin oral for 2 weeks.

Note: if fever and pain, treat like Acute Otitis Media.

Be aware of **MASTOIDITIS** (infection of the bone behind the ear) sometimes following after Otitis. There is severe pain with swelling and tenderness behind the ear. This needs referral to a hospital for surgery. Start with amoxicillin

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.

REFERENCES Upper respiratory tract infections (**21.1**).

21.2 PNEUMONIA

Lower Respiratory Tract Infections (LRTIs)

DEFINITION

Pneumonia / Lower Respiratory Tract Infections (LRTIs) are infections affecting the lungs and smaller airways. These can be viral, bacterial, parasitic or fungal infections. To define pneumonia in childhood and in adults different case definitions are used.

Case definition CHILDHOOD PNEUMONIA:		
Pneumonia:	Fast respiratory rate in 1 minute:	>60 breaths and infant <2 months >50 breaths and child 2 – 11 months >40 breaths and child 1-5 years
Severe pneumonia:	Pneumonia + indrawing of the chest wall	
Very severe pneumonia:	Severe pneumonia + one of the following:	central cyanosis (blue colour of lips) severe respiratory distress inability to drink or breastfeed

Case definition of ADULT PNEUMONIA:	
Pneumonia:	Fever AND cough AND abnormal chest sounds (see below)
Signs of severity in adults	
Rapid breathing	(RR >30/min in children more than 5 years and adults)
Cyanosis	(blue colour of lips or nails)
Reduced consciousness or confusion	
Low blood pressure	(SBP <90mmHg or DBP <60mm Hg)
High pulse rate	(>120 beats/minute)

SIGNS AND SYMPTOMS

- Dyspnoea, fast breathing.
- Cough, sputum – yellow or green.
- Coughing blood (haemoptysis).
- Chest Pain (with cough and deep breaths).
- Inspection: cyanosis, nasal flaring, chest in-drawing, 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.
- General unwell, tired.
- Tachycardia.
- Dehydration, low blood pressure.

On listening to the chest (auscultation), 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.

- 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.

- 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).

- Rales are small clicking, bubbling, or rattling sounds in the lungs. They occur when air opens closed air spaces.

- Rhonchi are sounds that resemble snoring. They occur when air through the large airways is (partially) blocked.

- Wheeze is a whistling sound caused by air passing through narrowed airways. Wheezes are heard in both lungs in asthma, many cases of Chronic Obstructive Pulmonary Disease (COPD) and some cases of pulmonary oedema. 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.

DIAGNOSIS Clinical. Chest X-ray if available.

PATIENTS AT RISK

- Aged under 2 months or more than 65 years.
- Patient with malnutrition or severe anaemia.
- Patient with heart disease.
- Patient with measles.
- Patient with splenectomy.

If your adult patient has **one or more signs OF SEVERITY**, or is from the '**patient at risk group**', treat as **SEVERE** pneumonia

TREATMENT

Treatment differs depending on clinical signs, age and other factors.

No sign of severity and patients not at risk - treat in OPD (NOT SEVERE)
Signs of severity and/or patients at risk - treat in IPD (SEVERE)

TREATMENT OF PNEUMONIA (NOT SEVERE)

- Increase fluid intake, treat the fever.
- Give a preventive dose of vitamin A to all children < 12 years.
- Antibiotics: amoxicillin.

Age Group	Dose: Mild – Moderate Infections		Dose: Severe Infections		Frequency
	mg	cc / tablets	mg	cc / tablets	
0 - 1 year	62.5mg	2.5cc	125mg	5cc = ½ tablet	TID
1 - 5 years	125mg	5cc = ½ tablet	250mg	10cc = 1 tablet	TID
6 - 12 years	250mg	10cc = 1 tablet	500mg	2 tablets	TID
Adult	500mg	2 tablets	1g	4 tablets	TID

- In case of **repeated attacks** of pneumonia or **persistent pneumonia** (after supervised treatment), consider the diagnosis **atypical pneumonia** (this is caused by specific bacteria like Mycoplasma pneumoniae). Treat with erythromycin or doxycycline for 10 days.
- In case of repeated attacks of pneumonia or persistent pneumonia (after supervised treatment of amoxicillin and erythromycin or doxycycline), consider **tuberculosis**.
  If you suspect TB (symptoms include coughing for more than 2-3 weeks, weight loss, coughing with blood and/or night sweats): see Annex 1 on managing a suspected case of TB (**21.5**).

TREATMENT OF SEVERE PNEUMONIA

- Admit in IPD, treat the fever, keep the patient in a half -sitting position.
- Give maintenance IV fluids, give oxygen.
- Give vitamin A treatment dose to all children < 12 years.
- Antibiotics:

Child:	**ampicillin** IV/IM 50 mg/kg QID + **gentamicin** IV/IM 7 mg/kg OD for 5 days
	if the child has responded well, change to oral amoxicillin (25 mg/kg TID) and IM/ IV gentamicin OD for a further 5 days (**Note:** for amoxicillin and gentamicin doses for neonates, see drug tables and neonatal guideline in appendix)
Adult:	**ampicillin** IV/IM 1 gram QID + **gentamicin** IV/IM 7 mg/kg OD for 5 days Followed by amoxicillin 500 mg TID oral (total 7-10 days)

If the patient is not better after 3 days, stop ampicillin and gentamicin, change to ceftriaxone for 10 days. Consider adding cloxacillin for children.

Note:

➔ If you cannot put in a cannula, use ampicillin IM in the same dose.
➔ Check temperature, pulse rate and respiratory rate regularly to see if the patient is getting better or worse.

Think about Beriberi (**see 17.2**) in babies < 1 year with sudden fast breathing and no or low-grade fever

Special Lower Respiratory Tract Infections

Bronchitis

* In **Acute bronchitis,** patients have a productive cough (with sputum) for 1-2 weeks without (or slight) fever and without signs of rapid breathing or tachycardia. As the most common cause of acute bronchitis is viral, no antibiotic treatment is needed. Chronic bronchitis is a form of chronic obstructive pulmonary disease (see COPD below).

Bronchiolitis

* **Bronchiolitis** is a viral infection of the tiny airways, called the bronchioles. As these airways become inflamed, they swell and fill with mucus, making it difficult for a child to breathe. Mild symptoms can be runny nose and a cough. In more severe cases you can see rapid, superficial breathing, chest indrawing, nasal flaring, rapid heartbeat and irritability. Sometimes you can hear the child wheezing without your stethoscope. Mild cases do not need a special treatment. Because bronchiolitis is usually viral, antibiotics do not work. When a child is severely dyspnoeic, give oxygen.

Aspiration pneumonia

* **Aspiration pneumonia**: Patients with decreased consciousness have high risk of aspiration pneumonia (inhaling acid or vomit from the stomach). Keep comatose patients in coma position (**see 7.1**). If a comatose patient develops signs of ARI treat with **ampicillin (IV) + metronidazole (IV)**.

Fungal pneumonia

* **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 (**15.3**).

Eosinophilic pneumonia

* **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 (see paragonimus below, intestinal worms (**12.4**), lymphatic filariasis (**15.2**) or as inflammatory or allergic reactions (including asthma see **21.4**). Treat the underlying cause.

Paragonimus

* **Paragonimus** is a 'fluke' (short flat worm) that mainly affects the lungs. It is caused by eating infected, undercooked, fresh water crabs and crayfish. Signs and symptoms are very like lung TB and include: cough with sputum, fever, blood (rust coloured) in sputum, haemoptysis, chest pain, pleural effusion. 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). Treat with **Praziquantel** 25mg / kg three times a day (TID) for 2 days. Praziquantel can be given in 2nd and 3rd trimester of pregnancy.

PREVENTION AND VACCINATION

For asplenic patients, amoxicillin should be given at the first sign of ARI. These patients should also receive pneumococcal vaccination. Cotrimoxazole should be given to individuals with HIV with low CD4 count (**see HIV 15.3**).

REFERENCES Beriberi (**17.2**), tuberculosis (**21.5**), asthma (**21.4**), liver abscess (**12.3**), HIV (**15.3**).

21.3 CHRONIC RESPIRATORY 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.

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.
- 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.

Bronchiectasis

DEFINITION

Bronchiectasis is a chronic disease of the bronchial tubes. The bronchial tubes become dilated so mucus stays in the bronchial tubes, resulting in recurrent infections. These infections lead to blockage of the tubes. The blockage causes the alveoli collapse.

SIGNS AND SYMPTOMS

- Cough with a lot of sputum every day
- Haemoptysis
- Wheezing
- Chronic sinusitis
- Many loud crepitations in inspiration and expiration.

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. There are many causes, most of which will gradually cause fibrosis of the soft tissue.

SIGNS AND SYMPTOMS

- In the early stages, no signs and symptoms
- Cyanosis
- Fast respiratory rate at rest
- Raised jugular pressure
- Clubbing (enlarged fingertips and a loss of the normal angle at the nail bed)
- Reduced expansion of the lung
- Inspiratory crepitations.

DIAGNOSIS Clinical. CXR can be very helpful if available.

Complications of Chronic Lung disease:

- Recurrent chest infection
- Poor nutrition and weight loss
- Heart failure
- Secondary polycythemia (raised haematocrit)
- Oedema due to heart failure and hypoxia of the kidney.

TREATMENT

Most chronic lung disease leads to irreversible damage to the lungs.
Management is symptomatic to slow the progress of dyspnoea:

- **STOP SMOKING.**
- Dilatation of the airways: **salbutamol, atrovent, aminophylline.**
- Prevent inflammation: **prednisolone** 30-40 mg OD oral for 2 weeks. Continue at lowest maintenance dose. Give deworming treatment before steroid use (**see 12.4**).
- Treat acute exacerbation due to infections and reduce inflammation: **amoxicillin or doxycycline.**
- Preventive treatment:
  - Do gentle exercise to stay active.
  - Supplementary feeding and dietary advice.
  - Antibiotic prophylaxis for those with repeated infections.
- Pulmonary rehabilitation:
  - Breathing exercises to increase respiratory muscle strength.
  - Body exercises.
- Self-management: education to understand the disease and control the 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 (Asthma and COPD)
- Prevent complications
- Educate the patient to understand the disease
- Psychosocial support
- Reduce number of clinic attendances

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.

PREVENTION

In order to prevent chronic lung disease and further complications,THE PATIENT MUST STOP SMOKING. Advise gentle exercise to stay active, supply supplementary feeding and dietary advice, give antibiotic prophylaxis for those with repeated infections.

REFERENCES Asthma (**21.4**), Tuberculosis (**21.5**).

21.4 ACUTE ASTHMA

DEFINITION

Asthma is a chronic inflammatory disorder of the airways, with acute reversible airflow obstructions. Asthma attacks can be triggered by allergens, infections and air particles (for example, cigarette smoke). The inflammation gets better with treatment with steroids (see below). Salbutamol will cause a short improvement in breathing but will NOT improve the inflammation. Asthma is most common in children and young adults.

Asthma can kill people and cause failure to grow in children

SIGNS AND SYMPTOMS

- Wheezing on breathing out.
- Shortness of breath.
- Chest pain.
- Decreases in peak flow.
- Coughing (either during the day or at night, but often worse at night and with exercise and activity).

➔ If a person has only asthma they do NOT have fever, do NOT cough up blood, and sputum is NOT green.

You have to decide the SEVERITY of the attack
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 the chart below):

- Pulse rate.
- Respiratory rate.
- Degree of difficulty breathing.
- How many words the person can say in one breath.
- Presence or absence of wheeze.
- Presence or absence of muscle retraction (indrawing).
- Peak flow value (see below).

A **peak flow meter** is a cheap and simple device and should be available in all clinics (ask your supervisor to get one). In the presence of one or more signs mentioned above, record peak flow measurement on admission and again after treatment with salbutamol or prednisolone. Record peak flow measurements on each consultation. Note: do not expect a child of less than 7 years to be able to perform a peak flow.

By using a peak flow meter, you can decide accurately if the patient is getting better with treatment. If the patient's peak flow measurements do not improve after appropriate treatment, then it is not asthma. Consider other diagnoses.

A Peak Flow Chart (see appendix) gives normal measurements for patients according to their height and age.

Remember that people with asthma can 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.**

DIAGNOSIS of asthma is by history, examination and investigation (peak flow).

TREATMENT

Treatment of ACUTE asthma has three parts (all are important):

1. Supportive: **Oxygen**
2. Short term: **Salbutamol**
3. Treatment of inflammation: Steroids (**prednisolone**). Note: always deworm patient when steroids are started (**see 12.4**).

- How these medicines are given depends on the severity of the asthma and the availability of different preparations (tablets, inhalers, injection, nebulisers).
- Other medicines are sometimes used in difficult or very severe cases (aminophylline IV and adrenaline IM).

HOW TO 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

➔ Review the patient's conditions often to adjust the treatment.

DECIDE SEVERITY OF ACUTE ASTHMA

	Mild/moderate attack	Severe attack	Life threatening attack
Difficulty breathing	When walking	On lying down	Always
Speaking	Normal – few words	Single words Child cannot feed	Cannot speak Child cannot feed
Consciousness	May be anxious	Agitated or very silent and not moving	Sleepy or confused
Wheezing	At the end of breathing out	Loud	Not heard, silent chest
Accessory muscles (indrawing)	No - minimal	Usually	Unusual movement
Respiratory rate / minute	Increased	Adult = over 30/min Child > 5yrs = over 40/min < 5yrs = over 50/min	(Fast or slow)
Pulse rate / Minute	Increased	Adult = over 120/min Child > 5yrs = over120/min < 5yrs = over140/min	Very fast or slow
Peak flow after treatment	Value is **> 70%** of normal	Value is **33% - 70%** of normal	Value is less than **33%** of normal

After you have decided the category (mild/ moderate, severe, life-threatening), treat the patient

	Mild/moderate attack	Severe attack	Life threatening attack
Admit	**No**	**Always**	**Always**
Salbutamol inhaler with spacer**	Yes 8-10 puffs in the first hour then 4 hourly as needed until full response*	**Yes** **10-15 puffs** every 15 -30 min in the first hour then 4 hourly until full response* **(nebuliser is better)**	**Yes** 10-15 puffs as much as needed until full response* **(nebuliser is better)**
Prednisolone	No	Essential **Adult:** 1mg/kg/day OD **Child:** First day**:** 1mg/kg **BID.** After:1 mg/kg OD until full response*	Essential **Adult:**1mg/kg/day OD **Child:** First day: 1mg/kg **BID.** After:1 mg/kg OD until full response*
Oxygen	No	Yes 6+ litres/minute	Essential **6+ litres/minute**
Salbutamol nebuliser	Not necessary	Yes with Oxygen 5mg 3 times per hour every 4 hours as needed until full response*	**Essential with oxygen** **5mg 3* per hour until full response**
Hydrocortisone IV***	No	Consider need	Can use
Aminophylline IV	No	Consider need	IV 5 mg/kg (max 500mg) over 1 hour every 6 hours
Salbutamol iv	No	No	Can use
Adrenaline IM	No	No	Consider need
Salbutamol tablet	If no inhaler	If no inhaler/ nebuliser	If no inhaler/ nebuliser

***Full response** = Peak Flow values, RR, PR are back to normal, patient can speak and breath normally, is no more agitated or confused, wheezes are decreased or absent, there is no more chest indrawing.

** Using a **spacer** makes the inhalation of salbutamol into the lungs much more effective. If you do not have one, you can easily **make one** with a clean 1.5/2 litre sprite or fanta bottle: make a hole in the bottom with the same shape as the mouthpiece of a ventolin inhaler. The inhaler can be placed directly into this hole (a tight fit is best). Ask the patient to breath via the top, spray 3-15 puffs (depending on severity) into the bottle. Wash the bottle with soap and water, let it air dry. Do not wipe it dry (the static causes the salbutamol to stick to the bottle).

*** Note: give hydrocortisone IV if the patient cannot take oral prednisone.

TEACH INHALATION TECHNIQUE AND CHECK IF SYMPTOMS ARE NOT WELL CONTROLLED

Doses of drugs that may be used in asthma:

1. Salbutamol		
Inhaling:	One puff is 100 microgram salbutamol (you can increase the dosage to 10-15 puffs (500-1000 micrograms) every 15 minutes	
Oral: Adult:		4 mg TID or QID
Child	< 2 years:	0.1mg/kg QID
	2-6 years:	1-2 mg TID/QID
	6-12 years:	2 mg TID or QID
IV: Adult:	250 micrograms over 10 minutes	

2. Prednisolone	
Oral: Adult:	1 mg/kg OD in the morning
Child:	1-2 mg/kg OD in the morning, maximum 40mg

3. Hydrocortisone		
IV: Adult:		250 mg TID
Child:	< 1 year	25 mg TID
	1-5 year	50 mg TID
	6-11 year	100 mg TID
Change to oral treatment (prednisolone) as soon as possible		

4. Aminophylline IV	
Never give direct IV: Dilute in D5W or normal saline. No loading dose if previously taking oral Theophylline or Aminophylline.	
Adult:	Loading Dose 250mg over 30 minutes Maintenance Dose: 0.5 mg/kg/hour
Child:	Loading Dose 5mg/kg over 20 minutes Maintenance Dose: 1 mg/kg/hour

DRUGS SIDE-EFFECTS

- Salbutamol tablets may be used when inhalers and nebulisers are not available but have greater side effects and are slower to act.
- 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 12.4**)

CHRONIC ASTHMA

PREVENTION/ LONG TERM TREATMENT

Prevention of chronic asthma should involve using **regularly inhaled steroids**, if possible by inhaler, e.g. beclomethasone twice daily. Inhaler technique is important for drug delivery and will be improved by using a homemade spacer (sprite bottle). The dose will depend on the response.

- OPD patient (mild attack) with persistent symptoms: Low dose steroid inhaler (e.g. one puff BID)
  (No inhaler: prednisolone oral)
  Inhaled salbutamol, via spacer when symptomatic.

- Patient discharged from IPD after moderate attack: Medium dose steroid inhaler (e.g. two puffs BID)
  (No inhaler: prednisolone oral)
  Inhaled salbutamol when symptomatic.
- Patient discharged from IPD after severe attack: High dose steroid inhaler (e.g. 4 puffs BID).
  (No inhaler: prednisolone oral)
  Inhaled salbutamol when symptomatic.

- Follow up in OPD (**Check peak flow value**) and reduce dose 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.
- Check peak flow value. Increase the dose until the peak flow value is normal.
- Keep the patient at this dose all the time to prevent him getting wheezy.
- If asthma attacks reduce to < 1 per month stop steroids and give inhaled salbutamol when symptomatic.

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).

Salbutamol ALONE does not prevent asthma

21.5 TUBERCULOSIS

SURVEILLANCE
See appendix

DEFINITION

Tuberculosis is a contagious disease caused by *Mycobacterium tuberculosis* (and occasionally by Mycobacterium bovis and *Mycobacterium africanum*), which also known as tubercle bacilli (TB bacilli).
TB infection is transmitted by air. A major source of infection is a patient with TB disease in the lung (Pulmonary TB), who is coughing and whose sputum smear is positive (i.e. sputum microscopy reveals TB bacilli). If an infectious person coughs or sneezes, tiny infectious particles of respiratory secretion, which contain tubercle bacilli, are produced. These infectious particles can remain suspended in the air for a long period. Consequently, people in close contact with an infectious person breathe in air containing infectious particles of TB bacilli.

A person infected with TB does not necessarily feel sick and such cases are known as silent or 'latent' infections. When the lung disease becomes 'active' and symptoms are developed, such cases are diagnosed with 'TB Disease'. In HIV uninfected populations, only 1 person out of 10 TB-infected people develop TB disease. But in HIV infected populations, the proportion developing TB disease is much higher, as an HIV infected person has 10 times increased risk of developing TB than a HIV uninfected individual.

TB commonly attacks the lungs (pulmonary tuberculosis) 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.

Different Types of TB

1. Pulmonary TB (lungs) - most common site
2. Extrapulmonary TB

Common	**Less common**
Pleural	Male genital tract
Lymph nodes (commonly in neck)	Female genital tract
Brain	Kidney
Abdomen	Adrenal gland
Pericardium (heart)	Skin.
Spine, other bones and joints.	

SIGNS AND SYMPTOMS

The most important symptoms of **Pulmonary Tuberculosis** are as follows:

- Cough for more than 2 or 3 weeks (with or without sputum production).
- Weight loss.

> Over 90 % of patients with sputum smear positive pulmonary TB develop a cough soon after disease onset. Most acute respiratory infections resolve within 3 weeks. Therefore a patient with a cough for more than 2 weeks is a pulmonary TB suspect and you must do sputum smear for diagnostic microscopy

Other symptoms are:

- Respiratory: coughing up blood, chest pain, breathlessness.
- General symptoms: fever, night sweats, tiredness, loss of appetite and secondary amenorrhoea (see Annex 1 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 (fast pulse rate), finger clubbing.
- Respiratory signs: often no abnormal signs in the chest, although you may hear crackles, wheezes, bronchial breath sounds, or amphoric breathing sounds on auscultation of the chest with a stethoscope.

Other forms of extra-pulmonary TB may present with the following:

- TB pleural effusion – chest pain, dullness, reduced or no air entry on the affected side.
- TB lymph adenopathy – enlargement of lymph nodes, usually in the neck and bilaterally.
- TB spine or bone – deformity, chronic bone infection.
- Brain – signs and symptoms of meningitis (headache, neurological deficit, loss of consciousness).
- TB Abdomen – ascites, abdominal mass.

DIAGNOSIS

Pulmonary TB

- Sputum for microscopic examination of Acid Fast Bacilli (AFB) (called AFB due to the bacilli's particular feature of resistance to de-colorisation by acid) for 3 successive days – simple, rapid and reliable for sputum smear positive cases.
- Culture (growing bacilli in a special media) – this is a more specific test, but it takes longer to know the result than the conventional method (4-6 weeks), it also requires high technology and skills and is expensive. It is recommended in case of:
  - Clinically suspect cases with 3 sputum smears (-)ve.

- Confirmation of treatment failure.
- Diagnosis of extra-pulmonary forms.
- Evaluation of treatment outcomes in drug-resistant TB.

- Drug Sensitivity Test (DST)
  This is recommended for clinically suspected Drug Resistant and Multi-drug Resistant (DR/MDR) cases when adapted treatment (MDR treatment is available) can be implemented.
- Chest X Ray – useful for smear negative pulmonary TB, and TB in children.
- Tuberculin skin test – indicates only exposure to infection, it does not indicate TB disease.

Other forms of TB

- FNAC (fine needle aspiration cytology) for lymph adenopathy.
- CXR – TB Pleural effusion, TB Pericarditis.
- Spine and Bone X Ray – bone and spine TB.
- Thoracocentesis and examination of pleural fluid - TB pleural effusion.
- Lumbar puncture and examination of CSF - TB meningitis.
- Abdominal paracentesis and examination of peritoneal fluid - TB abdomen.

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.

The First Line Drugs Anti-TB Drugs and Recommended Dosages

(see annex for weight based dosage as an example)

Anti-TB Drugs (Abbreviation)	Route of Administration	Both Children and Adult Dosage (mg/kg of body weight)	Average Dosage (Daily)
Isoniazid (H)	Oral	4-6 mg/kg	5 mg/kg
Rifampicin (R)	Oral	8-12 mg/kg	10 mg/kg
Pyrizinamide (Z)	Oral	20-30 mg/kg	25 mg/kg
Ethambutol (E)	Oral	15-20 mg/kg	15 mg/kg
Streptomycin (S)	Intramuscular Injection	12-18 mg/kg	15 mg/kg

(Consider age, body weight, existing liver or renal diseases, pregnancy and previous history of TB treatment before choosing a treatment regimen.)

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	2 HRZE	4 HR
TB Meningitis	2 SHRZ	4 HR

(Initial phase may need to extend 1 more 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	2 SHRZE/ 1HRZE	5 HRE
If **more than 5 months of E** in the previous treatment	2 SHRZE/ 1HRZE	5 HRZE

(Initial phase may need to extend 1 more 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

- Patients should avoid getting pregnant during treatment (**see family planning 20.2**).
- Rifampicin makes OC pills less effective. Use other form of contraceptives e.g. injection depopravora.
- If pregnant: streptomycin is contra-indicated as it can cause deafness to the baby. Use ethambutol instead.

Children and Elderly

- Avoid ethambutol.

PREVENTION & VACCINE

TB can be prevented by the following means:

BCG Vaccination for children

WHO & IUATLD recommend as a routine vaccination to all infants in area of high TB prevalence:

- Protection against severe forms of TB such as meningitis, miliary TB in infants.
- Vaccination lasts for 15 years in well nourished children.
- In HIV infected children, contraindicated only in active AIDS and in TB highly prevalent countries.

Maintaining Good Hygienic Practices

- Always cover mouth and nose with a tissue or handkerchief when coughing or sneezing.
- Keep doors and windows open during the day to provide ventilation and sunlight exposure.
- Spit only into a container.
- Proper disposal of excreta (sputum, saliva) from TB patients (burning, dumping in a pit).
- Keep good personal hygiene – regularly wash hands, take showers, wash hair, wear clean clothing, cut nails.

Improve Fitness

- Enough sleep, healthy diet, physical exercise. Do not smoke.

REFERENCES Respiratory diseases (**21**), HIV (**15.3**).

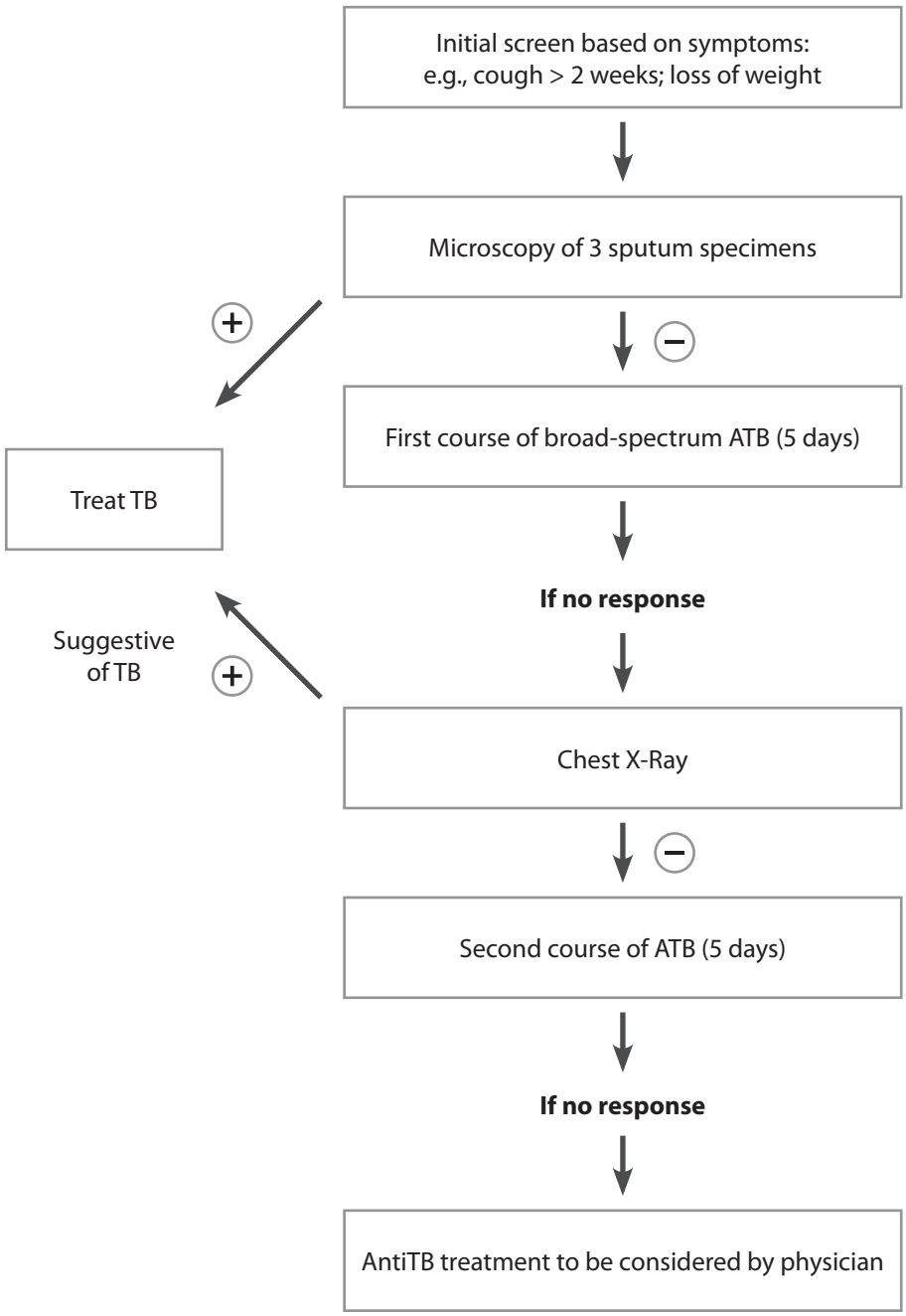
Drug Side Effects

Approach to drug side effects:

- Identify responsible drugs.
- Rule out other possible cause – e.g. scabies for itchiness, viral hepatitis for jaundice.
- Evaluate risk of side effects versus the consequences of treatment interruption.
- Minor: encourage the patient to continue anti-TB and symptomatic treatment e.g. chlorpheniramine for itchiness, paracetamol for joint pain, advise the patient to take their medication at bed-time.
- Most minor side effects are resolved within 2-3 weeks.

Side Effects	Responsible Agent	Intervention
Peripheral neuropathy (early symptoms: paresthesia, followed by prickling and burning sensation in feet, later in hands)	Isoniazid	Prevention by 10 mg of vitamin B6 as a routine. Treatment – 100-200mg of B6 daily (high dose may reduce the effectiveness of Isoniazid)
Hepatitis (Jaundice)	In descending order: Pyrazinamide Rifampicin 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 2 SHE + 10 HE.
Impaired of vision (Eye) (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.
Vestibulo-ototoxicity (Ear) (At early stage: dizziness, vertigo, ear ringing) and renal toxicity	Streptomycin	Reduce dose according to weight of the patient and maximum of 3 times per week. If repeated side effects – stop Streptomycin. In elderly patients and patients less than 35kg – 500mg dosage is safe and effective.
Skin manifestation or generalised hypersensitivity	All agents in descending order: Streptomycin Ethambutol Pyrazinamide Rifampicin Isoniazid	Minor (itchiness and rash): symptomatic treatment by Chlophenarimine and Calamine lotion Severe Steven Johnson Syndrome (fever rash, muco-cutaneous eruptions): stop treatment. Start reintroductory schedule when the symptoms are resolved.
Joint pain	Pyrazinamide	Symptomatic treatment by Paracetamol
Gastrointestinal upset (nausea, vomiting and abdominal pain)	Rifampicin	Give after small meal. Symptomatic treatment: Cimetidine or Metochlorpramide. Administer 2 hours before or 3 hours after TB medication.
Shock, purpura, acute renal failure	Rifampicin	Stop Rifampicin.

Annex. 1 Algorithm for Managing A Suspect Case of TB



Annex. 2 Example of Number of Tablets of Anti-TB Drugs According to Weight Brand

Table 1. Sample regimens (Category I) with separate anti-tuberculosis drugs in Adults

	Weight in Kg			
	30-39	**40-54**	**55-70**	**>70**
Initial Phase – Daily				
H 100 mg	1.5	2.5	3	3.5
R 150 mg	2	3	4	5
Z 400 mg	2	3	4	5
E 400 mg	1.5	2	3	3.5
S 1 g (in TB meningitis)	0.5	0.75	1	1
Continuation Phase – Daily				
H 100 mg	1.5	2.5	3	3.5
R 150 mg	2	3	4	5

Table 2. Sample regimens (Category I) with separate anti-tuberculosis drugs in Children

	Weight in Kg		
	5-10	**11-20**	**21-30**
Initial Phase – Daily			
H 100mg	1/2	1	2
R 150mg	1/2	1	2
Z 400mg	1/2	1	2
E 400mg	-	-	1
S 1 g (in TB meningitis)	1/4	1/3	0.5
Continuation Phase – Daily			
H 100mg	1/2	1	2
R 100mg	1/2	1	2

Table 3. Sample regimens with fixed-dose combination of anti-TB drugs in Adults

	Weight in Kg			
	30-39	**40-54**	**55-70**	**>70**
Initial Phase – Daily				
HRZE (75mg+150mg+400mg+275mg)	2	3	4	5
Or HRZ (75mg+150mg+400mg)	2	3	4	5
S 1 g (in TB meningitis or CAT II)	0.5	0.75	1	1
Continuation Phase – Daily				
HR (75mg+150mg)	2	3	4	5
Add E 400 mg in CAT II	1.5	2	3	3.5

Table 4. Sample regimens with fix-dosed anti-tuberculosis drugs in Children (paediatric formulations)

	Weight in Kg					
	Up to 7	**8-9**	**10-14**	**15-19**	**20-24**	**25-29**
Initial Phase – Daily						
HRZ (30mg+60mg+150mg)	1	1 1/2	2	3	4	5
E 400mg	-	-	-	-	1	1
S 1 g	0.25	0.25	0.25	0.33	0.50	0.50
Continuation Phase – Daily						
H R (30mg+60mg)	1	1 1/2	2	3	4	5

22 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.

Remember: any skin lesion can become infected
If skin lesions are wet with pus, red, warm/hot, or if the patient has fever: treat with antibiotics

22.1 IMPETIGO

DEFINITION

This is a bacterial infection of the skin. It spreads easily amongst children. Transmission is by direct contact. Often starts around a bite or a scratch. May spread over days to weeks. The lesions are round, flattish, with crusts and usually 0.5 to 3cm in size. They are sometimes wet. Treat also any pre-existing skin disease (scabies, ringworm, eczema etc).

1. LOCALISED Less than 3 spots with pus and red skin on one part of the body, often around the mouth, behind the ears, on the hands or feet. No fever. **Note**: If the child is a neonate go directly to Type 2: EXTENSIVE.

TREATMENT

- Clean with water and soap or antiseptic (for example savlon or chlorhexidine).
- Remove the crust, cut the fingernails, shave the head if necessary (if a lot of lesions on the head).
- Apply **gentian violet** (GV) 2 times/day.
- If on the face apply antiseptic BID instead of gentian violet.
- Keep dry (if on the buttocks of children, leave them uncovered).
- Quarantine from school until crusts are dry.
- Treat contacts.

2. EXTENSIVE 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 **cloxacillin** 500 mg QID for 7-10 days (children 25 mg/kg/dose QID for 7 days).
  or erythromycin 25 mg/kg QID for 7 days, if allergic to penicillin.
- Incise abscesses.

22.2 ABSCESS

DEFINITION

This is a collection of pus in the soft tissues. 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.

Some abscesses are not hot and not painful ('cold' abscess).
If you find this, think of TB.

FIRST STAGE the skin is hard.

TREATMENT

- Apply warm compresses four times per day.
- Treat the pain with paracetamol or aspirin.
- **No antibiotic** is needed, ONLY give **Cloxacillin** for 7 days (or **erythromycin** if allergic to **penicillin**) in case of:
  - 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** (500 mg QID).

SECOND STAGE very painful. One point on the skin (exactly above the puscollection) is soft and should be opened.

TREATMENT

- Use gloves and sterile materials.
- Use local lidocain 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.
- 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.

Avoid manipulating an abscess in the face due to the risk of cavernous sinus thrombosis – treat such cases as severe, with high dose IV antibiotics.

22.3 CELLULITIS

DEFINITION

This is a spreading acute bacterial infection under the skin, with redness, swelling (not localised as in an abscess) and pain, with local lymph gland enlargement. The borders of the infection are not very well defined. There can be high fever. 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!

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 (higher than the heart) of the limb.
- Cool and wet dressing.
- **Do not cut open**.
- Give ASA for pain and inflammation, if over 12 years of age. If less than 12 years, use paracetamol for pain.
- Give antibiotics:

1. Mild cases

- **Cloxacillin PO** (child 25 mg/kg QID, Adult 500 mg QID) x 7 days and follow up regularly.
- For penicillin allergic patients, use erythromycin (child 25mg/kg QID; adult 500mg QID) PO.
- 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 if possible.
- Start intravenous **benzyl penicillin** (child >1 month 25 mg/kg QID, adult 1.2 g QID) and IV cloxacillin 1g QID for adults and 50mg/kg for children.
- If **no improvement** after 48 hours or patient's condition is getting worse, **add gentamicin** OD (4mg/kg neonates; 7 mg/kg in children and adults).

22.4 WOUNDS

TREATMENT

- Remove foreign bodies with water. Clean with antiseptic.
- Apply **gentian violet.**
- Give **Tetanus prevention care (see below).**
- For large wounds, apply a mixture of sugar and iodine to make the wound heal faster – **Note**: to keep the ants away put the legs of the bed into pots filled with water.
- Dress the wound daily until the wound is clean and dry.
- Do not stitch wounds that are more than 6 hours old.
- Refer severe deep wounds to hospital for surgery.
- Use antibiotic prophylaxis (treatment dose of **cloxacillin**) in cases where there is: known valvular heart disease, diabetes, peripheral vascular disease (painful, cold feet), decreased immunity, penetrating wounds, abdominal trauma, wounds with bone fractures, wounds with devitalized tissue, wounds greater than 5 cm, contaminated wounds.

WOUND CARE AND TETANUS PREVENTION

RISK	PATIENT VACCINATION COMPLETE Last booster was:			PATIENT VACCINATION **NOT COMPLETE** (< 3 doses)
	< 5 years	**> 5 years**	**> 10 years**	
LOW *	None	None	Booster	Start or complete vaccination (full course of 5 doses)
HIGH **	Antibiotics	Antibiotics Booster	Antibiotics Serotherapy Booster	Antibiotics Serotherapy Start or complete vaccination

* Low risk wound: minor wounds, scratches.
** High risk wound: deep wounds, war wounds, wounds with bone fractures, wounds with devitalized tissue, extensive burns, foreign body; wounds older than 6 hours.

Antibiotics: **Cloxacillin** 5 days
Booster: Tetanus toxoid vaccine 0.5 ml by IM into upper arm or buttock.
Serotherapy: Adults: 250 units Tetanus Immune Globulin IM STAT with part of the dose infiltrated around the wound. If the injury is >24 hours ago, or heavy infection or after burns give 500 units of TIG.
Children of any age: 250 Units of Tetanus Immune Globulin IM STAT.

22.5 BURNS

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 burned nose hairs or soot around the nose and mouth.

EXAMINATION

Severity of burns are evaluated on the basis of the depth, size and location of the burn
The depth of burn is categorised as follows:

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

To calculate the amount of burned skin use the patients hand: the area covered with 1 hand = 1% skin area. Do not count any superficial burns.

Burns are more severe when on the face, hands, joints and perineum.

22 SKIN DISEASES

CLASSIFICATION

MILD BURN

- Patient is in good condition.
- No burns on face, hands, joints and perineum.
- Area: partial thickness less than 10%;full thickness less than 2%.

SEVERE BURN (ALWAYS ADMIT TO IPD)

- Inhalation of hot smoke: burns on face, burnt nasal hairs, noisy breathing.
- Burns on face, hands, joints or perineum.
- Area: more than 10% partial thickness; full thickness more than 2%.

TREATMENT

- **Systemic:** compensate for fluid loss.
- **Pain:** burns are extremely painful.
- **Local:** aid healing, prevent infection, prevent contractures.

Emergency treatment:	Assess
Airway & Breathing:	If there is history of smoke inhalation or soot around the face, give oxygen and refer
Circulation:	If there is a severe burn, insert two 16G cannulas and give a fluid bolus (NSS 1L in adults and 20 ml/kg in children)
Analgesia:	Cover the burnt area with cling film. Paracetamol, Tramadol or Morphine

Ongoing treatment for severe burns

- IV Fluids: a lot of fluid is lost through a burn so calculate the amount needed using the formula

Total volume of Ringers solution = Weight (kg) x Area of Burn (%)

- Give half of this volume over the first eight hours and the remainder over the next 16 hours.
- Insert urine catheter to measure urine output.
- Use a fluid input/output chart to monitor fluid balance. If urine output falls to less than 0.5ml/kg/hour, consider giving a fluid bolus.
- Regular observation.

Pain Treatment

All patients require pain relief. (**See 7.5**) paracetamol, tramadol or morphine. One method of effective pain relief is covering the burn. Dressings are very painful so always give analgesia first.

Local treatment

- Clean with antiseptic (not containing alcohol).
- Tetanus prophylaxis (**see wounds 22.4**).
- Apply silver sulfadiazine cream (avoid antibiotic creams).
- Cover with sterile bandages.
- If there is no healing after 21 days, skin grafts are required.

22.6 SCABIES

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

Symptoms include itching (especially at night). Small sores and scratch marks can be found between the fingers and toes, around the wrists, axilla or groin and other places. Other members in the family may have it too. Scabies lasts for weeks to months. The sores can become infected: treat the infection first (**see Impetigo 22.1**) and then the scabies.

TREATMENT

- Treat secondary infection first.
- Wash the whole body with water and soap.
- Apply 5% Permethrin lotion on the whole body (except face) or Benzyl Benzoate Lotion 25% adults (12% in children) avoiding mucous membranes, STAT dose. Allow to dry and then put on clean clothes. Do not wash for at least 12 hours. It may be easier to apply Permethrin in the evening to avoid washing. (Do not use permethrin on infants under 2 months of age).
- Cut fingernails and apply permethrin under the nails.
- Treat all people in the family and close contacts at the same time.
- Wash the clothes with boiled water and soap. Put bedding (for example blankets) in the sun for 2 days or put them in a closed plastic bag for 4 days.
- For severe cases (Norwegian scabies) permethrin 5% on day 1 then BBL for day 2-7; then repeat for several weeks.
- Educate patients that the itching may continue for several weeks. This is a reaction to the dead parasite. Calamine lotion may be needed.

If no response after treatment make sure that the treatment has been applied properly and that all members of the family have been treated.

22.7 FUNGAL INFECTIONS

DEFINITION OF CANDIDA

Fungal infection of the skin or mucous membranes. Mostly seen in patients with previous use of antibiotics, diabetes mellitus, decreased immunity or pregnancy. Common types of infection are oral candidiasis (oral thrush: removable white spots in the mouth, painful difficult swallowing) and vaginal candidiasis (**9.1 and 13.5**).

TREATMENT

Oral Thrush

- Apply **gentian violet** after each meal.
- If the child is dependent on breast milk, treat directly with **nystatin** (crushed tabs with powder applied to all parts of the mouth using the mother's clean finger) 4 times per day.
- If severe or no response to GV, use **nystatin** (crushed tabs) or mouth tablets (to suck in the mouth).

- For treatment in HIV/AIDS patients, **see 15.3**.

Vaginal Candidiasis

- Nystatin vaginal tabs 100,000 IU OD inserted high in the vagina at bedtime, for 14 days.
- Consider **Nystatin** 2-4 weeks if above treatment fails or
  Clotrimazole 200 mg vaginal tablets 3 nights or 100 mg for 6 nights.
- If the patient has vulvitis, supplement the treatment with antifungal cream – **clotrimazole, econazole**.

DEFINITION OF RINGWORM

Fungal infection of the skin. 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 but there is no pain or fever. Sometimes there are pustules. On the scalp it may be associated with localised loss of hair.

TREATMENT

- Clean with water and soap.
- If on the scalp: shave the head.
- Apply **whitfield ointment** BID for at least 3 weeks. Note: do not use whitfield ointment in children or on the face.
- If there is no improvement after three weeks, or in children, apply **clotrimazole cream** BID for three weeks.
- For very severe cases, or if no improvement after the above treatment, consult a doctor or give **griseofulvin** (adults 500 mg daily, children 10 mg/kg/day as a single dose) for 6 weeks or until hair re-grows, usually 6-8 weeks. (Note: Men should not make their wives pregnant within 6 months of treatment; women should wait until 1 month after treatment before getting pregnant).
- For ringworm of the scalp, treat secondary infection first (topical treatment never works). At least 3 months of **griseofulvin** is needed to prevent recurrence.
- Consider oral **fluconazole** (adult 150 mg/week, children 8 mg/kg/week for 8-12 weeks).

If there is no improvement, make sure it is not leprosy (**see 22.14**)

22.8 ALLERGY / URTICARIA

DEFINITION

Allergic skin reaction.

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.

Allergies are common to:

- Medication: If the patient is under a new treatment (quinine, amoxicillin, cotrimoxazole.)
- Insect bites, cat hair, worms, colouring in drinks, contact with plants/metals, food.

Note: often, it is impossible to find the cause of the allergy.

TREATMENT

- Cool down with water.
- Remove the cause: stop new medication, stop contact with plants/metals, foods etc.
- Cut fingernails to prevent infection.
- If severe itching: give **chlorpheniramine** (adult 4 mg, children 0.1mg/kg, 4-6 hourly) until itching stops.

In case of oedema on the face	Admit and give	Dexamethasone IV or IM or Hydrocortisone sodium succcinate IV or IM	
If difficulty breathing	Give	Adrenaline IM	Children: 0,01 mg/kg/dose, Adult 0.5 mg/ dose
		See management of SHOCK (**see 7.6**)	

22.9 ECZEMA

DEFINITION

Non-specific inflammatory skin reaction to special factors.

SIGNS AND SYMPTOMS

Itchy lesions anywhere on the body, usually on both sides of the body (especially at the front of the elbows and behind the knees). 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. It can appear and disappear many times at the same place. Secondary infections are common.

If infected, treat the infection first (see Impetigo) and then the eczema

TREATMENT

- Do not scratch; 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.
- **Rinse clothes very well, so that no soap stays on.**
- When dry, apply **Vaseline.**
- If severe consider using steroid cream for example **hydrocortisone** or **betamethasone**, if available.
- If very itchy, treat with **chlorpheniramine.**

➔ Steroid creams are of different strengths: hydrocortisone is mild, betamethasone is stronger. Be careful when applying strong steroid creams for a long period as it can damage the skin. Use the weakest cream that you can for the shortest time possible.

22.10 HERPES SIMPLEX

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 infection11.2**).

If a pregnant woman has a genital lesion, it can be very dangerous for the newborn baby because the baby can become infected during delivery.

TREATMENT

Oral **aciclovir**, if available, 200 mg 5 times per day for 7 days, given **in the first 48 hours** is indicated for the severe cases with necrotic lesions or in the face spreading to the eye.

1. On the skin
   - Clean lesions with **savlon** and let dry.
   - Apply **GV** (Note: not on the face).
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.
   - **Terramycine Eye ointment**.
   - Refer to doctor for consultation.
4. On the genitals: see STI (**13.5**).
   - 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.

22.11 VARICELLA ZOSTER

Chickenpox

DEFINITION

This is a very common disease caused by a 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 impetigo 22.1**).
- Treat the fever with paracetamol.
- Only in cases of severe itching, give **chlorpheniramine** 1-3 days.
- If sores in the eye treat with **Terramycine eye ointment**.

Herpes Zoster

DEFINITION

Rash of vesicles (water spots) on one area of the skin. It is caused by the same virus as chicken pox but occurs many years after chicken pox (reactivation). It may happen at any age, but frequently in patients with low immunity (**see HIV 15.3**).

SIGNS AND SYMPTOMS

- Often fever and a few chills a few days before the rash develops. Feeling unwell.
- Moderate to severe pain at the site where the rash will develop.
- 4 or 5 days later the vesicles appear on a red base (similar to herpes simplex but over a larger area).
- The vesicles become pustules, then crusts.
- The rash appears in the surrounding area of the affected nerve (dermatome), very often on the chest but it can be found anywhere on the skin or mucosa (depending on the affected nerve).
- The rash is usually only on one side of the body.

TREATMENT

- Treat lesions as for Herpes Simplex.
- Apply cold compresses.
- Follow pain protocol (**see 7.5**). If pain is not relieved by painkillers, amitryptiline may be needed.
- If eye is affected or severe disease refer to a doctor. Acyclovir can help if available, but only if given in the first 48 hours after eruption of lesions.
- The patient is infectious to people who have not had chicken pox.

22.12 CUTANEOUS LARVA MIGRANS

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.

TREATMENT **Mebendazole** 100 mg BID for 3 days or **albendazole** 400 mg OD for 3 days.

PREVENTION Wearing shoes or sandals.

22.13 LARVA CURRENS

DEFINITION

The disease is caused by migrating Strongyloides stercoralis larvae.

SIGNS AND SYMPTOMS

Itchy red tracks on the skin found between the neck and knees that last for hours or a day or two. The rash comes and goes.

TREATMENT **Albendazole** 400 mg OD for 3 days.

PREVENTION Wearing shoes or sandals.

22.14 LEPROSY

Leprosy can look like many other skin conditions, some nerve and bone and eye conditions.

DEFINITION

Leprosy is caused by a bacterium, Mycobacterium Leprae. Untreated, smear positive, lepromatous cases could spread the bacterium from their noses through the air, although the risk of infection is not very high. Touching the skin of a person with leprosy almost certainly 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 bacterium. There are two diagnostic points; think of leprosy when you have a patient with:

- A skin patch that does not itch, lasts for 6 weeks or more, does not look like one of the common skin conditions and does not improve with other treatment.
- Both skin changes AND nerve signs (enlargement, reduced feeling or loss of movement). A pale 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 (lagophthalmus), 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.

DIAGNOSIS

If your area has a leprosy control programme, refer any suspected patient for diagnosis and management

If your area has no leprosy control programme, do the following:

- Take the history. Short duration (3 weeks or less), and itching make the diagnosis less likely.
- Test the centre of the skin lesion with cotton wool and a common pin. Loss of sensation suggests leprosy. 'Light touch' feeling is lost before pain sensation.

Physical examination should include:

1. Check the patient's entire body, in a good light, for abnormal patches of skin, colour change, dryness, loss of hair.

2. Check nerves for enlargement:

- Ulnar – inside and slightly above the elbow in the ulnar grove (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 abnormal skin, hands, feet and face for loss of 'light touch' feeling using a piece of cotton wool or paper. Also for pain (pinprick) and temperature sensation loss.

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 wasting:
(Peroneal) - pull foot up (flex ankle), no foot drop. (Tibial) - push foot down (extend ankle). (Radial) - bend wrist back (extend wrist). (Median) - back of hand on table, thumb up (abduct thumb). (Ulnar) - back of hand on table, thumb down (adduct thumb) - little finger out (abduct little finger) – index finger out (abduct index finger) – hold paper between fingers (adduct index finger). (Facial) - close eyes

Take a skin smear from 4 to 6 sites and a nose blow specimen.

- Right and left earlobe and the margin of two patches and include two areas of 'normal' skin.
- Make a 5 mm long and 2 - 3 mm deep cut with a scalpel. Avoid bleeding and blood interfering with the staining by squeezing the skin before and during cutting. Turn the scalpel and scrape the edge of the cut.
- Smear the tissue of each site on a slide over an area about 7 mm in diameter, stain according to the Zeehl Nielsen method and examine for acid-fast bacilli (AFB).

Diagnosis is confirmed by finding bacteria (AFB) in skin or nose together with clinical changes in skin or nerves typical of 'lepromatous' leprosy. If the skin and nose smears are negative the patient can still have leprosy. Many patients have 'tuberculoid' type leprosy with negative skin smears.

TREATMENT

The medical treatment with drugs is probably the simplest part of the help needed by a person with leprosy. It is relatively easy to kill the leprosy bacteria and stop it infecting others, provided the drugs are taken in the correct combination and for long enough. However, nerves damaged by leprosy do not recover beyond the first few weeks and remain damaged for life. Preventing nerve damage is essential.

Protecting hands, feet and eyes which cannot feel during a whole lifetime, providing rehabilitation with skin care, protective footwear, physiotherapy, occupational therapy and material and psychological support are all essential and require long term commitment to the patient and by the patient.

DRUG TREATMENT

Dapsone 100mg daily (OD), **clofazimine** 50mg daily (OD).
Rifampicin 600mg once monthly, **Clofazimine** 300mg once monthly.
The monthly doses are given under supervision. This triple therapy should be given for a minimum of 2 years and continued until the skin smears becomes negative for acid-fast bacilli from at least 3 sites on at least 2 following occasions separated by at least a month.

Drug side-effects:

- Dapsone can produce haemolytic anaemia and G6PD activity should be tested. Dapsone should be used under close supervision or avoided if G6PD-deficient patients.
- Dapsone may cause skin rash, sometimes severe.
- Clofazimine turns the skin orange/brown. This fades slowly when the drug is stopped.
- Ethionamide or prothionamide are alternatives to clofazimine and may cause liver problems.
- Rifampicin turns urine orange. This is not dangerous.

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: rest, **aspirin, prednisolone** in high dose (adult 40-60mg daily), which should reduce the nerve pain in 1 to 2 days and be slowly decreased over 3 to 4 months. Continue anti-leprosy treatment.

2. Severe reaction in 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: Start anti–leprosy drugs and use prednisolone.

3. Systemic illness with fever and malaise, usually on treatment.
   May be nerve, muscle, bone and joint pain, lymph node enlargement, iritis, testicular pain, proteinuria, erythema nodosum (red tender nodules which may ulcerate) due to an immune–complex reaction. This illness may cause death.

Treatment: **Thalidomide** is the most effective treatment but is difficult to obtain and absolutely never to be used in women unless it is completely sure they cannot become pregnant. **Clofazimine** in higher dose (300mg daily for up to 3 months) or **chloroquine** may be used. **Prednisolone** is the treatment for severe cases (when Thalidomide is not available) and it can be difficult to stop this without recurrence of the reaction in some severe chronic cases.

PREVENTION

of damage to anaesthetic (non feeling) feet, hands and eyes is essential.

- Footwear with a strong sole (car tyre rubber) to protect against spikes and soft layer (microcellular rubber) to protect against pressure damage are important when feet have no feeling.
- Gloves may be helpful to protect hands during manual work and cooking.
- Plain glasses (no magnification) can help to protect eyes without sensation.
- Hands and feet should be soaked in water for about 30 minutes every day to soften dry skin, then scraped and vegetable oil applied. This prevents the skin from cracking and becoming ulcerated and infected.
- Joint stiffness can be prevented by passive movement exercises and should be done slowly, carefully and regularly every day.

EDUCATION

The patient should be helped and shown how to prevent damage to numb hands, feet and eyes. Rest is the ideal, but is often not possible. The importance of regular (several times a day) examination of the hands and feet for injuries and prompt treatment should be stressed. Thinking about and avoiding problems such as heat burns is important.

REHABILITATION

Surgery and physiotherapy play an important role in the 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 restore lost sensation.

THREE STEPS FOR PREVENTION

- Early detection, and treatment of the disease.
- Early recognition and adequate treatment of complications.
- Patient education in self care.

Note

Many people with leprosy become demoralised and depressed by the reaction of others to their deformities and the limitations that this places on their lives. The recognition of depression and its treatment, both with drugs and other supportive measures, is essential. Overcoming the stigma people attach to this disease and the unnecessary fear, due to ignorance, is a vital part of the long term care of these people

23 SUBSTANCE ABUSE

Abuse of substances could lead to dependence (addiction) of a person to that substance. You can speak of dependence if a person has three or more of the following signs:

- A strong desire to take the substance.
- Difficulty controlling the intake of the substance (from the time of starting intake, termination and amount of intake).
- 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 subject in the person's life.
- The person continues to take the substance even though he/she knows the bad consequences of taking it.

23.1 ALCOHOL AND DRUGS 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.

Withdrawal reaction: Chronic consumers of some substances (e.g. people who use a drug often) could become dependent on that substance. Finally they need the drug to function normally (physical dependence). Signs and symptoms: the patient has clinical signs that usually are the opposite of the effects of the drug.
Symptoms of a withdrawal reaction can persist for several days.

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 with counsellors, the patient and the relatives, otherwise they may start using the drug again

Alcohol

1. 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.
- vomiting.
- change in behaviour.
- Agitation.
- Euphoria.
- loss of control.
- poor coordination.

With increasing amounts of alcohol intake the person can become drowsy and comatose.

TREATMENT

- In case of coma:
  - Rehydrate with IV **NSS** when unconscious.
  - When the patient can swallow advise plenty of fluids (>3L) in order to expel the alcohol from the body.
  - Watch for signs of hypoglycaemia (**see 10.1**).
  - 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, 7.1, and aspiration pneumonia 21.1**).
- In case of agitation or violence:
  - **Diazepam** 10 mg IV, repeat if needed after 30 minutes.
  - Rehydrate (oral or IV). Check for hypoglycaemia and treat if present.

In acute alcohol intoxication there is a high risk of hypoglycaemia (**see 10.1**)
Chronic alcohol intake is associated with vitamin B1 deficiency (see beri beri, **17.2**)

2. WITHDRAWAL REACTION

SIGNS AND SYMPTOMS

- Slight fever (this is a sign of severity).
- Seizures (this is a sign of severity).
- Tachycardia (fast pulse).
- Sweating.
- Nausea, vomiting.
- Neurological signs such as anxiety, tremor (alternating movements of flexion and extension of the wrists).
- Auditory and visual hallucinations.
- Confusion, hyperactivity, anxiety attacks, poor sleep.

TREATMENT

- **Diazepam** 10 mg IV, can be repeated several times until the patient is sedated.
- A reducing dose of oral diazepam (e.g. 10 mg BD for 2 days, 5 mg TID 2 days, 5 mg OD 2 days, stop) may prevent complications.
- If hallucinations: **chlorpromazine** 25 mg PO QID.
- **Vitamins:** Thiamine 100 mg/day, Vitamin B12 1 mg/day, folic acid 5 mg/day.

Opioid/Heroine/Morphine

These drugs can be smoked, inhaled via the nose, or injected IV.

1. ACUTE INTOXICATION

SIGNS AND SYMPTOMS

- Euphoria (patient always laughing).
- Flushed skin (feeling of being hot on the face, red skin).
- Itchy skin (especially with morphine).
- Myosis (small pupils).
- Drowsiness.
- Deep and decreased respiratory rate.
- Hypothermia.
- Bradycardia, hypotension.

TREATMENT

The antidote for morphine intoxication is not available in our context. Treatment is symptomatic: prevention of complications and sedation.

2. WITHDRAWAL REACTION

SIGNS AND SYMPTOMS

- Anxiety.
- Increased respiratory rate.
- Increasing body secretions: sweating, running nose, tears.
- Mydriasis (dilated pupils).
- Pilo-erection (skin hairs becoming straight) ('gooseflesh').
- Tremors: flexion/extension of the wrists.
- Minor muscle contractions, muscle pain.
- Hot and cold flushes.
- Anorexia.
- Abdominal pain/cramps.

TREATMENT

- **Diazepam** 10 mg IV, can be repeated several times until the patient is sedated.
- A reducing dose of oral diazepam (e.g. 10 mg BD for 2 days, 5 mg TID 2 days, 5 mg OD 2 days, stop) may prevent complications.
- Methadone and clonidine are used elsewhere but are not available in our setting. Treatment is symptomatic.

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

- Very tired.
- Insomnia (sleeplessness).
- Anxiety.
- Severe depression (including risk of suicide).
- Auditory and visual hallucinations.
- feelings of paranoia, persecution or omnipotence.

Some types of amphetamine can produce more severe signs and symptoms:

- Severe hyperthermia (very high temperature).

- Disseminated intravascular coagulation (bleeding disorders).
- Rhabdomyalysis (muscle damage).
- Seizures.
- Acute renal failure.
- Liver toxicity.
- Heart problems.

TREATMENT

- **Chlorpromazine** 25-50mg IM rapidly reverses acute agitation.
- **Ammonium chloride** 500mg PO every 4 hours (reduces pH of urine to increase the elimination of amphetamines).

23.2 BETEL NUT CHEWING

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 Thailand/ Burma 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

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.

Betel nut chewing can cause vitamin B1 deficiency. Patients with regular complaints of peripheral beri beri should be advised to stop betel nut consumption.

REFERENCES Dental problems (**9**), Asthma (**21.4**), vitamin B1 deficiency (**17.2**).

24 APPENDIX

This appendix consists of several parts:		Chapter
1.	SURVEILLANCE AND OUTBREAK	**24.1**
2.	HB (LOVIBOND) WITH HCT EQUIVALENTS	**24.2**
3.	PEAK FLOW TABLES	**24.3**
4.	WEIGHT FOR HEIGHT INDEX	**24.4**
5.	BODY MASS INDEX	**24.5**
6.	ORAL REHYDRATION SOLUTIONS	**24.6**
7.	SCHEDULE OF IMMUNISATION	**24.7**
8.	MALARIA TREATMENT TABLES	**24.8**
9.	DRUG DOSES	**24.9**
10.	DRUGS DURING PREGNANCY	**24.10**
11.	NEWBORN & INFANT GUIDELINES	**24.11**
12.	INDEX	**25**

24.1 SURVEILLANCE AND OUTBREAK

A health surveillance system has been introduced in the border camps for displaced populations on the Thailand/ Burma 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.

DISEASES UNDER SURVEILLANCE

Acute diarrhoea, Dysentery, Cholera, Typhoid fever, Tuberculosis, Measles, Diphtheria, Pertussis, AFP/ suspected Poliomyelitis, Dengue infection, Malaria, Filariasis, Scrub Typhus, Meningitis, Encephalitis, Leptospirosis, STDs. Others: abnormal or severe cases, deaths of unknown origin, or where the suspected cause of death is infectious disease **(for case definitions see next page).**

The system is passive surveillance from which health service centres in border camps notify regularly to district health office, provincial health office and Bureau of Epidemiology. The notification has been classified into 3 categories as follows:

1. Routine

The border camps send a monthly report form to district health offices, copied to provincial health offices and the Bureau of Epidemiology before the 15th of the each month, via e-mail. The border camps

also send a complete surveillance report to the CCSDPT Health Information System by the 15th of each month.

Diseases under routine surveillance by the Bureau of Epidemiology and CCSDPT are indicated with:

SURVEILLANCE
See appendix

2. Urgent

The following diseases must be reported within 24 hours to the Bureau of Epidemiology and CCSDPT due to the need of rapid investigation: **Cholera, Measles, Diphtheria, Acute Flaccid Paralysis (poliomyelitis), Meningococcal meningitis,** abnormal or severe cases, deaths of unknown origin, or where the suspected cause of death is infectious disease.

Diseases which must be reported the Bureau of Epidemiology and CCSDPT within 24 hours are indicated with:

URGENT REPORT
SEE APPENDIX

3. 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 or 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:** 4.1 Suspected Typhoid Fever: Patient who presents with fever ≥ 38.5°C (axillary) for more than 7 days, and negative malaria slide and no other identified cause of fever and at least one of the following: abdominal pain and/or diarrhoea and/or constipation and/or relative bradycardia.
4.2 Confirmed case: Patient who has blood culture positive for Salmonella typhi.

5. **Tuberculosis:** Newly diagnosed patient who is in one of these categories (based on WHO diagnostic criteria):

- Pulmonary Tuberculosis, sputum smear positive: patient with at least two initial sputum smear examinations (direct smear microscopy) positive for Acid-Fast Bacilli (AFB), or Patient with one sputum examination positive for acid-fast bacilli and radiographic abnormalities consistent with active pulmonary tuberculosis as determined by the treating medical officer, or Patient with one sputum specimen positive for acid-fast bacilli and at least one sputum that is culture positive for acid-fast bacilli.
- Pulmonary Tuberculosis, sputum smear negative: Patient with symptoms suggestive of tuberculosis and having one of the following: Three sputum specimens negative for acid-fast bacilli, Radiographic abnormalities consistent with pulmonary tuberculosis and a lack of clinical response to one week of a broad-spectrum antibiotic, Decision by a physician to treat with a full curative course of anti-tuberculosis chemotherapy
- Extra pulmonary tuberculosis: Tuberculosis of organs other than lungs: pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, tuberculous meningitis, etc. Diagnosis should be based on one culture positive specimen from an extra pulmonary site, or histological or strong clinical evidence consistent with active extra-pulmonary tuberculosis, follow by medical officer decision to treat with a full course of anti-tuberculosis therapy. Any patient diagnosed with both pulmonary and extra-pulmonary tuberculosis should be classified as a case of pulmonary tuberculosis

6. **Measles:** Patient with a 3-day history of fever greater than or equal to 38.5°C AND maculopapular (non-vesicular) rash AND at least one of the following: coryza OR cough OR conjunctivitis.

7. **Diphtheria:** An upper respiratory tract illness characterised by sore throat, low grade fever, and an adherent membrane of the tonsil(s), pharynx, and/or nose. Or a patient with laboratory confirmation of Corynebacterium diphtheriae from a clinical specimen.

8. **Pertussis:** Patient presenting with cough for at least 2 weeks and paroxysms of coughing and/or whooping and/or post tussive vomiting.

9. **Acute Flaccid Paralysis:** Patient presenting with acute flaccid paralysis, including Guillain-Barre Syndrome among children aged less than 15 years and all cases of suspected poliomyelitis among persons of any age.

10. **Dengue Infection:** Patient with lab confirmed Dengue fever or in an epidemic the case definition can be extended to a patient with fever less than 7 days and malaria slide neg. with at least 2 of the following: headache, pain behind the eyes, myalgia & arthralgia (severe body pain), haemorrhagic signs (including pos. tourniquet test).

11. **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°C (axillary), negative malaria slide and at least one of the following: meningeal syndrome (headache, neck stiffness) or positive Kernig' s sign or bulging fontanel in an infant or with cloudy CSF. Meningococcal meningitis: Patient with sudden onset of fever, and petechial or purpural rash and at least one of the following: neck stiffness, altered consciousness, other meningeal sign or laboratory confirmed.

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, • Abnormal Vaginal discharge excluding Candidiasis, • Genital ulcer

- Pelvic inflammatory disease (PID): symptoms of lower abdominal pain and pain during sexual intercourse with an examination showing vaginal discharge, lower abdominal tenderness on palpation, and /or temperature > 38°C

24.2 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		35
76	12.7		38
84	14.0		42
92	15.3	0	46
100	16.7		50
110	18.3		55
120	20.0		60
130	21.7		65

24.3 PEAK FLOW TABLES

PEAK FLOW – NORMAL VALUES

MEN													
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
WOMEN													
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

24.4 WEIGHT FOR HEIGHT INDEX

Z-Score NCHS/CDC
sex combined references (child up to 84,5 cm)

Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Score	-4 Z-Scores	Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Score	-4 Z-Scores
50.0	3.4	2.8	2.6	2.2	1.8	**68.0**	7.9	6.8	6.4	5.7	4.9
50.5	3.4	2.8	2.6	2.2	1.8	**68.5**	8.0	6.9	6.5	5.8	5.0
51.0	3.5	2.9	2.7	2.3	1.9	**69.0**	8.2	7.1	6.7	5.9	5.1
51.5	3.6	3.0	2.7	2.3	1.9	**69.5**	8.3	7.2	6.8	6.0	5.3
52.0	3.7	3.1	2.8	2.4	1.9	**70.0**	8.5	7.3	6.9	6.1	5.4
52.5	3.8	3.1	2.9	2.4	2.0	**70.5**	8.6	7.5	7.0	6.3	5.5
53.0	3.9	3.2	2.9	2.5	2.0	**71.0**	8.7	7.6	7.2	6.4	5.6
53.5	4.0	3.3	3.0	2.5	2.1	**71.5**	8.9	7.7	7.3	6.5	5.7
54.0	4.1	3.4	3.1	2.6	2.1	**72.0**	9.0	7.8	7.4	6.6	5.8
54.5	4.2	3.5	3.2	2.7	2.2	**72.5**	9.1	7.9	7.5	6.7	5.9
55.0	4.3	3.6	3.3	2.8	2.2	**73.0**	9.2	8.0	7.6	6.8	6.0
55.5	4.4	3.6	3.4	2.8	2.3	**73.5**	9.4	8.2	7.7	6.9	6.4
56.0	4.6	3.8	3.5	2.9	2.4	**74.0**	9.5	8.3	7.8	7.0	6.2
56.5	4.7	3.9	3.6	3.0	2.5	**74.5**	9.6	8.4	7.9	7.1	6.3
57.0	4.8	4.0	3.7	3.1	2.5	**75.0**	9.7	8.5	8.1	7.2	6.4
57.5	4.9	4.1	3.8	3.2	2.6	**75.5**	9.8	8.6	8.2	7.3	6.5
58.0	5.1	4.2	3.9	3.3	2.7	**76.0**	9.9	8.7	8.3	7.4	6.6
58.5	5.2	4.3	4.0	3.4	2.8	**76.5**	10.0	8.8	8.4	7.5	6.7
59.0	5.3	4.4	4.1	3.5	2.9	**77.0**	10.1	8.9	8.5	7.6	6.8
59.5	5.5	4.6	4.2	3.6	3.0	**77.5**	10.2	9.0	8.5	7.7	6.9
60.0	5.6	4.7	4.3	3.7	3.1	**78.0**	10.4	9.1	8.6	7.8	6.9
60.5	5.7	4.8	4.5	3.8	3.2	**78.5**	10.5	9.2	8.7	7.9	7.0
61.0	5.9	4.9	4.6	3.9	3.3	**79.0**	10.6	9.3	8.8	8.0	7.1
61.5	6.0	5.1	4.7	4.1	3.4	**79.5**	10.7	9.4	8.9	8.1	7.2
62.0	6.2	5.2	4.8	4.2	3.5	**80.0**	10.8	9.5	9.0	8.1	7.3
62.5	6.3	5.3	5.0	4.3	3.6	**80.5**	10.9	9.6	9.1	8.2	7.4
63.0	6.5	5.5	5.1	4.4	3.7	**81.0**	11.0	9.7	9.2	8.3	7.4
63.5	6.6	5.6	5.2	4.5	3.9	**81.5**	11.1	9.8	9.3	8.4	7.5
64.0	6.7	5.7	5.4	4.7	4.0	**82.0**	11.2	9.9	9.4	8.5	7.6
64.5	6.9	5.9	5.5	4.8	4.1	**82.5**	11.3	10.0	9.5	8.6	7.7
65.0	7.0	6.0	5.6	4.9	4.2	**83.0**	11.4	10.1	9.6	8.7	7.8
65.5	7.2	6.1	5.8	5.0	4.3	**83.5**	11.5	10.1	9.6	8.7	7.8
66.0	7.3	6.3	5.9	5.2	4.4	**84.0**	11.5	10.2	9.7	8.8	7.9
66.5	7.5	6.4	6.0	5.3	4.6	**84.5**	11.6	10.3	9.8	8.9	8.0
67.0	7.6	6.5	6.1	5.4	4.7						
67.5	7.8	6.7	6.3	5.5	4.8						

Height assessed standing from 85.0 cm

Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Score	-4 Z-Scores	Length cm	Median kg	-1.5 Z-Score	-2 Z-Scores	-3 Z-Score	-4 Z-Scores
85.0	12.0	10.4	9.8	8.7	7.7	**108.0**	17.8	15.5	14.7	13.2	11.6
85.5	12.1	10.5	9.9	8.8	7.7	**108.5**	18.0	15.7	14.8	13.3	11.7
86.0	12.2	10.6	10.0	8.9	7.8	**109.0**	18.1	15.8	15	13.4	11.8
86.5	12.3	10.7	10.1	9.0	7.9	**109.5**	18.3	15.9	15.1	13.5	11.9
87.0	12.4	10.8	10.2	9.1	8.0	**110.0**	18.4	16	15.2	13.6	12.0
87.5	12.5	10.9	10.3	9.2	8.1	**110.5**	18.6	16.2	15.4	13.8	12.2
88.0	12.6	11.0	10.4	9.3	8.2	**111.0**	18.8	16.4	15.5	13.9	12.3
88.5	12.8	11.1	10.5	9.4	8.2	**111.5**	18.9	16.5	15.7	14.0	12.4
89.0	12.9	11.2	10.6	9.5	8.3	**112.0**	19.1	16.7	15.8	14.2	12.5
89.5	13.0	11.3	10.7	9.6	8.4	**112.5**	19.3	16.8	15.9	14.3	12.6
90.0	13.1	11.4	10.8	9.6	8.5	**113.0**	19.4	16.9	16.1	14.4	12.8
90.5	13.2	11.5	10.9	9.7	8.6	**113.5**	19.6	17.1	16.2	14.6	12.9
91.0	13.3	11.6	11.0	9.8	8.6	**114.0**	19.8	17.3	16.4	14.7	13.0
91.5	13.4	11.7	11.1	9.9	8.7	**114.5**	19.9	17.4	16.5	14.8	13.1
92.0	13.6	11.8	11.2	10.0	8.8	**115.0**	20.1	17.6	16.7	15.0	13.3
92.5	13.7	11.9	11.3	10.1	8.9	**115.5**	20.3	17.7	16.8	15.1	13.4
93.0	13.8	12.0	11.4	10.2	9.0	**116.0**	20.5	17.9	17.0	15.3	13.5
93.5	13.9	12.1	11.5	10.3	9.0	**116.5**	20.7	18.1	17.2	15.4	13.7
94.0	14.0	12.2	11.6	10.4	9.1	**117.0**	20.8	18.2	17.3	15.6	13.8
94.5	14.2	12.3	11.7	10.4	9.2	**117.5**	21.0	18.4	17.5	15.7	13.9
95.0	14.3	12.4	11.8	10.5	9.3	**118.0**	21.2	18.5	17.6	15.8	14.1
95.5	14.4	12.5	11.9	10.6	9.4	**118.5**	21.4	18.7	17.8	16.0	14.2
96.0	14.5	12.6	12.0	10.7	9.4	**119.0**	21.6	18.9	18.0	16.2	14.3
96.5	14.7	12.8	12.1	10.8	9.5	**119.5**	21.8	19.1	18.1	16.3	14.5
97.0	14.8	12.9	12.2	10.9	9.6	**120.0**	22.0	19.3	18.3	16.5	14.6
97.5	14.9	13.0	12.3	11.0	9.7	**120.5**	22.2	19.4	18.5	16.6	14.8
98.0	15.0	13.1	12.4	11.1	9.8	**121.0**	22.4	19.6	18.7	16.8	14.9
98.5	15.2	13.2	12.5	11.2	9.8	**121.5**	22.6	19.8	18.8	16.9	15.0
99.0	15.3	13.3	12.6	11.3	9.9	**122.0**	22.8	20.0	19.0	17.1	15.2
99.5	15.4	13.4	12.7	11.4	10.0	**122.5**	23.1	20.2	19.2	17.3	15.3
100.0	15.6	13.6	12.8	11.5	10.1	**123.0**	23.3	20.4	19.4	17.4	15.5
100.5	15.7	13.7	12.9	11.6	10.2	**123.5**	23.5	20.6	19.6	17.6	15.6
101.0	15.8	13.8	13.0	11.7	10.3	**124.0**	23.7	20.7	19.7	17.7	15.7
101.5	16.0	13.9	13.2	11.8	10.4	**124.5**	24.0	21.0	19.9	17.9	15.9
102.0	16.1	14.0	13.3	11.9	10.4	**125.0**	24.2	21.2	20.1	18.1	16.0
102.5	16.2	14.1	13.4	12.0	10.5	**125.5**	24.4	21.3	20.3	18.2	16.2
103.0	16.4	14.3	13.5	12.1	10.6	**126.0**	24.7	21.6	20.5	18.4	16.3
103.5	16.5	14.4	13.6	12.2	10.7	**126.5**	24.9	21.8	20.7	18.6	16.4
104.0	16.7	14.5	13.7	12.3	10.8	**127.0**	25.2	22.0	20.9	18.7	16.6
104.5	16.8	14.6	13.8	12.4	10.9	**127.5**	25.4	22.2	21.1	18.9	16.7
105.0	16.9	14.7	14.0	12.5	11.0	**128.0**	25.7	22.4	21.3	19.1	16.9
105.5	17.1	14.9	14.1	12.6	11.1	**128.5**	26.0	22.6	21.5	19.2	17.0
106.0	17.2	15.0	14.2	12.7	11.2	**129.0**	26.2	22.8	21.7	19.4	17.1
106.5	17.4	15.1	14.3	12.8	11.3	**129.5**	26.5	23.1	21.9	19.6	17.3
107.0	17.5	15.2	14.5	12.9	11.4	**130.0**	26.8	23.3	22.1	19.7	17.4
107.5	17.7	15.4	14.6	13.0	11.5						

Weight-for-Height index
% median for adolescent girls 10-18 years (NCHS/CDC/WHO)

				Malnutrition		
				Moderate		Severe
Height (cm)	100%	85%	80%	75%	70%	60%
133.5	29.3	24.9	23.4	22.0	20.5	17.6
134.0	29.6	25.2	23.7	22.2	20.7	17.8
134.5	30.0	25.5	24.0	22.5	21.0	18.0
135.0	30.3	25.8	24.2	22.7	21.2	18.2
135.5	30.6	26.0	24.5	23.0	21.4	18.4
136.0	31.0	26.4	24.8	23.3	21.7	18.6
136.5	31.3	26.6	25.0	23.5	21.9	18.8
137.0	31.7	26.9	25.4	23.8	22.2	19.0
137.5	32.0	27.2	25.6	24.0	22.4	19.2
138.0	32.4	27.5	25.9	24.3	22.7	19.4
138.5	32.7	27.8	26.2	24.5	22.9	19.6
139.0	33.0	28.1	26.4	24.8	23.1	19.8
139.5	33.4	28.4	26.7	25.1	23.4	20.0
140.0	33.7	28.6	27.0	25.3	23.6	20.2
140.5	34.1	29.0	27.3	25.6	23.9	20.5
141.0	34.4	29.2	27.5	25.8	24.1	20.6
141.5	34.7	29.5	27.8	26.0	24.3	20.8
142.0	35.1	29.8	28.1	26.3	24.6	21.1
142.5	35.4	30.1	28.3	26.6	24.8	21.2
143.0	35.8	30.4	28.6	26.9	25.1	21.5
143.5	36.1	30.7	28.9	27.1	25.3	21.7
144.0	36.4	30.9	29.1	27.3	25.5	21.8
144.5	36.8	31.3	29.4	27.6	25.8	22.1
145.0	37.1	31.5	29.7	27.8	26.0	22.3
145.5	37.4	31.8	29.9	28.1	26.2	22.4
146.0	37.8	32.1	30.2	28.4	26.5	22.7
146.5	38.1	32.4	30.5	28.6	26.7	22.9
147.0	38.4	32.6	30.7	28.8	26.9	23.0
147.5	38.8	33.0	31.0	29.1	27.2	23.3
148.0	39.1	33.2	31.3	29.3	27.4	23.5
148.5	39.5	33.6	31.6	29.6	27.7	23.7
149.0	39.8	33.8	31.8	29.9	27.9	23.9
149.5	40.1	34.1	32.1	30.1	28.1	24.1
150.0	40.5	34.4	32.4	30.4	28.4	24.3
150.5	40.8	34.7	32.6	30.6	28.6	24.5
151.0	41.2	35.0	33.0	30.9	28.8	24.7
151.5	41.5	35.3	33.2	31.1	29.1	24.9
152.0	41.9	35.6	33.5	31.4	29.3	25.1
152.5	42.3	36.0	33.8	31.7	29.6	25.4
153.0	42.6	36.2	34.1	32.0	29.8	25.6
153.5	43.0	36.6	34.4	32.3	30.1	25.8
154.0	43.4	36.9	34.7	32.6	30.4	26.0
154.5	43.8	37.2	35.0	32.9	30.7	26.3
155.0	44.2	37.6	35.4	33.2	30.9	26.5
155.5	44.6	37.9	35.7	33.5	31.2	26.8
156.0	45.1	38.3	36.1	33.8	31.6	27.1
156.5	45.5	38.7	36.4	34.1	31.9	27.3
157.0	46.0	39.1	36.8	34.5	32.2	27.6
157.5	46.5	39.5	37.2	34.9	32.6	27.9
158.0	47.0	40.0	37.6	35.3	32.9	28.2
158.5	47.6	40.5	38.1	35.7	33.3	28.6
159.0	48.2	41.0	38.6	36.2	33.7	28.9
159.5	48.9	41.6	39.1	36.7	34.2	29.3
160.0	49.7	42.2	39.8	37.3	34.8	29.8
160.5	50.5	42.9	40.4	37.9	35.4	30.3
161.0	51.6	43.9	41.3	38.7	36.1	31.0

Weight-for-Height index
% median for adolescent boys 10- 18 years NCHS/CDC/WHO

				Malnutrition		
				Moderate		Severe
Height (cm)	100%	85%	80%	75%	70%	60%
130.5	27.2	23.1	21.8	20.4	19.0	16.3
131.0	27.5	23.4	22.0	20.6	19.3	16.5
131.5	27.8	23.6	22.2	20.9	19.5	16.7
132.0	28.0	23.8	22.4	21.0	19.6	16.8
132.5	28.3	24.1	22.6	21.2	19.8	17.0
133.0	28.6	24.3	22.9	21.5	20.0	17.2
133.5	28.9	24.6	23.1	21.7	20.2	17.3
134.0	29.2	24.8	23.4	21.9	20.4	17.5
134.5	29.5	25.1	23.6	22.1	20.7	17.7
135.0	29.9	25.4	23.9	22.4	20.9	17.9
135.5	30.2	25.7	24.2	22.7	21.1	18.1
136.0	30.5	25.9	24.4	22.9	21.4	18.3
136.5	30.8	26.2	24.6	23.1	21.6	18.5
137.0	31.1	26.4	24.9	23.3	21.8	18.7
137.5	31.4	26.7	25.1	23.6	22.0	18.8
138.0	31.8	27.0	25.4	23.9	22.3	19.1
138.5	32.1	27.3	25.7	24.1	22.5	19.3
139.0	32.4	27.5	25.9	24.3	22.7	19.4
139.5	32.7	27.8	26.2	24.5	22.9	19.6
140.0	33.1	28.1	26.5	24.8	23.2	19.9
140.5	33.4	28.4	26.7	25.1	23.4	20.0
141.0	33.8	28.7	27.0	25.4	23.7	20.3
141.5	34.1	29.0	27.3	25.6	23.9	20.5
142.0	34.4	29.2	27.5	25.8	24.1	20.6
142.5	34.8	29.6	27.8	26.1	24.4	20.9
143.0	35.1	29.8	28.1	26.3	24.6	21.1
143.5	35.5	30.2	28.4	26.6	24.9	21.3
144.0	35.8	30.4	28.6	26.9	25.1	21.5
144.5	36.1	30.7	28.9	27.1	25.3	21.7
145.0	36.5	31.0	29.2	27.4	25.6	21.9
145.5	36.9	31.4	29.5	27.7	25.8	22.1
146.0	37.2	31.6	29.8	27.9	26.0	22.3
146.5	37.6	32.0	30.1	28.2	26.3	22.6
147.0	37.9	32.2	30.3	28.4	26.5	22.7
147.5	38.3	32.6	30.6	28.7	26.8	23.0
148.0	38.6	32.8	30.9	29.0	27.0	23.2
148.5	39.0	33.2	31.2	29.3	27.3	23.4
149.0	39.3	39.3	31.4	29.5	27.5	23.6
149.5	39.7	33.7	31.8	29.8	2.8	23.8
150.0	40.0	34.0	32.0	30.0	28.0	24.0
150.5	40.4	34.3	32.3	30.3	28.3	24.2
151.0	40.8	34.7	32.6	30.6	28.6	24.5
151.5	41.1	34.9	32.9	30.8	28.8	24.7
152.0	41.5	35.3	33.2	31.1	29.1	24.9
152.5	41.9	35.6	33.5	31.4	29.3	25.1
153.0	42.3	36.0	33.8	31.7	29.6	25.4
153.5	42.6	36.2	34.1	32.0	29.8	25.6
154.0	43.0	36.6	34.4	32.3	30.1	25.8

154.5	43.4	36.9	34.7	32.6	30.4	26.0
155.0	43.8	37.2	35.0	32.9	30.7	26.3
155.5	44.2	3.6	35.4	33.2	30.9	26.5
156.0	44.6	37.9	35.7	33.5	31.2	26.8
156.5	45.0	38.3	36.0	33.8	31.5	27.0
157.0	45.4	38.6	36.3	34.1	31.8	27.2
157.5	45.8	38.9	36.6	34.4	32.1	27.5
158.5	46.7	39.7	37.4	35.0	32.7	28.0
159.0	47.1	40.0	37.7	35.3	33.0	28.3
159.5	47.5	40.4	38.0	35.6	33.3	28.5
160.0	48.0	40.8	38.4	36.0	33.6	28.8
160.5	48.4	41.1	38.7	36.3	33.9	29.0
161.0	48.8	41.5	39.0	36.6	34.2	29.3
161.5	49.3	41.9	39.4	37.0	34.5	29.6
162.0	49.8	42.3	39.8	37.4	34.9	29.9
162.5	50.2	42.7	40.2	37.7	35.1	30.1
163.0	50.7	43.1	40.6	38.0	35.5	30.4
163.5	51.2	43.5	41.0	38.4	35.8	30.7
164.0	51.6	43.9	41.3	38.7	36.1	31.0
164.5	52.1	44.3	41.7	39.1	36.5	31.3
165.0	52.6	44.7	42.1	39.5	36.8	31.6
165.5	53.1	45.1	42.5	39.8	37.2	31.9
166.0	53.6	45.6	42.9	40.2	37.5	32.2
166.5	54.1	46.0	43.3	40.6	37.9	32.5
167.0	54.6	46.4	43.7	41.0	38.2	32.8
167.5	55.1	46.8	44.1	41.3	38.6	33.1
168.0	55.6	47.3	44.5	41.7	38.9	33.4
168.5	56.2	47.8	45.0	42.2	39.3	33.7
169.0	56.7	48.2	45.4	42.5	39.7	34.0
169.5	57.3	48.7	45.8	43.0	40.1	34.4
170.0	57.8	49.1	46.2	43.4	40.5	34.7
170.5	58.4	49.6	46.7	43.8	40.9	35.0
171.0	59.0	50.2	47.2	44.3	41.3	35.4
171.5	59.6	50.7	47.7	44.7	41.7	35.8
172.0	60.2	51.2	48.2	45.2	42.1	36.1
172.5	60.8	51.7	48.6	45.6	42.6	36.5
173.0	61.4	52.2	49.1	46.1	43.0	36.8
173.5	62.1	52.8	49.7	46.6	43.5	37.3
174.0	62.7	53.3	50.2	47.0	43.9	37.6
174.5	63.4	53.9	50.7	47.6	44.4	38.0

24.5 BODY MASS INDEX

Adults (18 years and older) Weight (kg) / Height2 (m)

Height (cm)	Body Mass Index						Height (cm)	Body Mass Index					
	18.5	18	17.5	17.0	16.5	16		18.5	18	17.5	17.0	16.5	16
140	36.3	35.3	34.3	33.3	32.3	31.4	**165**	50.4	49.0	47.6	46.3	44.9	43.6
141	36.8	35.8	34.8	33.8	32.8	31.8	**166**	51.0	49.6	48.2	46.8	45.5	44.1
142	37.3	36.3	35.3	34.3	33.3	32.3	**167**	51.6	50.2	48.8	47.4	46.0	44.6
143	37.8	36.8	35.8	34.8	33.7	32.7	**168**	52.2	50.8	49.4	48.0	46.6	45.2
144	38.4	37.3	36.3	35.3	34.2	33.2	**169**	52.8	51.4	50.0	48.6	47.1	45.7
145	38.9	37.8	36.8	35.7	34.7	33.6	**170**	53.5	52.0	50.6	49.1	47.7	46.2
146	39.4	38.4	37.3	36.2	35.2	34.1	**171**	54.1	52.6	51.2	49.7	48.2	46.8
147	40.0	38.9	37.8	36.7	35.7	34.6	**172**	54.7	53.3	51.8	50.3	48.8	47.3
148	40.5	39.4	38.3	37.2	36.6	35.5	**173**	55.4	53.9	52.4	50.9	49.4	47.9
149	41.1	40.0	38.9	37.7	36.6	35.5	**174**	56.0	54.5	53.0	51.5	50.0	48.4
150	41.6	40.5	39.4	38.3	37.1	36.0	**175**	56.7	55.1	53.6	52.1	50.5	49.0
151	42.2	41.0	39.9	38.8	37.6	36.5	**176**	57.3	55.8	54.2	52.7	51.1	49.6
152	42.7	41.6	40.4	39.3	38.1	37.0	**177**	58.0	56.4	54.8	53.3	51.7	50.1
153	43.3	42.1	41.0	39.8	38.6	37.5	**178**	58.6	57.0	55.4	53.9	52.3	50.7
154	43.9	42.7	41.5	40.3	39.1	37.9	**179**	59.3	57.7	56.1	54.5	52.9	51.3
155	44.4	43.2	42.0	40.8	39.6	38.4	**180**	59.9	58.3	56.7	55.2	53.5	51.8
156	45.0	43.8	42.6	41.4	40.2	38.9	**181**	60.6	59.0	57.3	55.7	54.1	52.4
157	45.6	44.4	43.1	41.9	40.7	39.4	**182**	61.3	59.6	58.0	56.3	54.7	53.0
158	46.2	44.9	43.7	42.4	41.2	39.9	**183**	62.0	60.3	58.6	56.9	55.3	53.6
159	46.8	45.5	44.2	43.0	41.7	40.4	**184**	62.6	60.9	59.2	57.6	55.9	54.2
160	47.4	46.1	44.8	43.5	42.2	41.0	**185**	63.3	61.6	59.9	58.2	56.5	54.8
161	48.0	46.7	45.4	44.1	42.8	41.5	**186**	64.0	62.3	60.5	58.8	57.1	55.4
162	48.6	47.2	45.9	44.6	43.3	42.0	**187**	64.7	62.9	61.2	59.4	57.7	56.0
163	49.2	47.8	46.5	45.2	43.8	42.5	**188**	65.4	63.6	61.9	60.1	58.3	56.6
164	49.8	48.4	47.1	45.7	44.4	43.0	**189**	66.1	64.3	62.5	60.7	58.9	57.2
							190	66.8	65.0	63.2	61.4	59.6	57.8

24.6 ORAL REHYDRATION SOLUTIONS

ORS

HOW TO MAKE ORAL REHYDRATION SOLUTION

Use one ORS powder sachet and mix it with clean boiled water that has been cooled. Read the directions on the sachet to see how much water to add.

Dilute ORS

HOW TO MAKE DILUTE ORAL REHYDRATION SOLUTION

1 packet (size for 750cc water) of ORS powder + 1500 cc clean water
+ 30g sugar + 1.5g potassium

OR

1 packet (size for 1000cc water) of ORS powder + 2000 cc clean water
+ 40g sugar + 2.5g potassium

Sugar Salt Solution

HOW TO MAKE A SUGAR SALT SOLUTION FOR ORAL REHYDRATION

Take 1 litre of boiled water that has been cooled,
add half of a teaspoon of salt and 8 teaspoons of sugar

A teaspoon is a 5 ml spoon. If you do not have spoons or 1 litre containers available, then the 'pinch and scoop' method can also be used:

Take one cup of water (240 ml)
add a small pinch of salt using 3 fingers.
Before you add the sugar, taste the drink to make sure it's no saltier than tears. Too much salt can be harmful.
If then the drink tastes right, then add a small hand palm scoop of sugar.

Boiled Rice Water

HOW TO MAKE A RICE BASED DRINK FOR ORAL REHYDRATION

Note: AsiaMIX can be used instead of rice paste if the child is NOT severely malnourished.

1 Take one handful (20 to 25 grams) of rice grain.
Wash and soak the rice in water until it is soft.

2 Grind the soaked rice with a pestle and mortar (or any other grinder) until it becomes a paste.

3 Put two and a quarter glasses of water (about 600ml) into a cooking pot and mix in the rice paste.

4 Stir well, and heat the mixture until it begins to bubble and boil.
Then take the pan off the fire, and leave the solution to cool.

5 Add a pinch of salt using 3 fingers (up to the first finger joints) (1.5 grams) to the mixture, and stir well. The solution is now ready to be given to the person with diarrhoea.

Storage: this solution should be covered and kept in a cool clean place.
It should be used not more than six to eight hours after preparation.
After this time, throw away any leftover solution.

24.7 SCHEDULE OF IMMUNISATION

Several diseases can be prevented by immunisation (also known as vaccination). The following vaccines are available in this area:

Disease	Vaccine
Tuberculosis	BCG
Measles	Measles
Poliomyelitis	OPV
Diphtheria	**D**PT
Pertussis(whooping cough)	D**P**T
Tetanus	DP**T** or T alone
Hepatitis B	Hep B

1. RECOMMENDED SCHEDULE OF VACCINATION (WHO)

– **Note: this is not the only valid schedule**

At birth	BCG + polio 0 + HepB1
At 6 weeks	DPT1 + polio1 + HepB2
At 10 weeks	DPT2 + polio2
At 14 weeks	DPT3 + polio3 + HepB3*
At 9 months	Measles
1 year after DPT3	booster DPT + polio

*HepB3 could be given 6 months after HepB2.

➔ **In case of a measles epidemic, immunise all children from age 6 months to 10 years. Repeat the dose after 12 months for the babies who received the vaccine between the age of 6 and 9 months.**

2. PREGNANT WOMEN AND MOTHERS

During the first Ante Natal Clinic consultation	T1
1-2 month after T1	T2
6 months after T2	T3
One year after T3	T4
One year after T4	T5

OR

Any time (15 to 45 years of age)	T1
One month after T1	T2
Any time during next pregnancy	T3
Any time during next pregnancy	T4
Any time during next pregnancy	T5

New arrivals

On arrival	BCG + polio 0 + DPT1+ HepB1+ measles
At 6 weeks	DPT2 + polio1 + HepB2
At 10 weeks	DPT3 + polio2
At 14 weeks	polio3 + HepB3*
At 9 months	Measles
1 year after DPT3	booster DPT + polio

24.8 MALARIA TREATMENT TABLES

For doses and length of treatment: **see Malaria Chapter, 15.2**

Artesunate PO

This table is made calculating **1 tablet = 50 mg**.
There are also 200 mg tablet: in this case calculate according to strength.

WEIGHT Kg	4 mg/kg mg – tablets	2 mg/kg mg - tablets
5-7	20-28mg = ½ t	10-14mg = ¼ t
8-9	32-36mg = ¾ t	16-18mg = ¼ t
10	40mg = ¾ t	20mg = ½ t
11-14	44-56mg = 1 t	22-28mg = ½ t
15	60mg = 1¼ t	30mg = ½ t
16-17	64-68mg = 1¼ t	32-34mg = ¾ t
18-20	72-80mg = 1½ t	36-40mg = ¾ t
21	84mg = 1¾ t	42mg = ¾ t
22-23	88-92mg = 1¾ t	44-46mg = 1 t
24-26	96-104mg = 2 t	48-52mg = 1 t
27-28	108-112mg = 2¼ t	54-56mg = 1 t
29	116mg = 2¼ t	58mg = 1¼ t
30-32	120-128mg = 2½ t	60mg = 1¼ t
33-34	132-136mg = 2¾ t	66-68mg = 1¼ t
35	140mg = 2¾ t	70mg = 1½ t
36	144mg = 3 t	72mg = 1½ t

WEIGHT kg	4 mg/kg mg – tablets	2 mg/kg mg - tablets
37-39	148-156mg = 3 t	74-76mg = 1½ t
40	160mg = 3¼ t	80mg = 1½ t
41-42	164-168mg = 3¼ t	82-84mg = 1¾ t
43-45	172-180mg = 3½ t	86-90mg = 1¾ t
46	184mg = 3¾ t	92mg = 1¾ t
47-48	188-192mg = 3¾ t	94-96mg = 2 t
49-51	196-204mg = 4 t	98-102mg = 2 t
52-53	208-212mg = 4¼ t	104-106mg = 2 t
54	216mg = 4¼ t	108mg = 2¼ t
55-57	220-228mg = 4½ t	110-114mg = 2¼ t
58-59	232-236mg = 4¾ t	116-118mg = 2¼ t
60	240mg = 4¾ t	120mg = 2½ t
61-64	244-256mg = 5 t	122-128mg = 2½ t
65	260mg = 5¼ t	130mg = 2½ t
66-67	264-268mg = 5¼ t	132-134mg = 2¾ t
68-70	272-280mg = 5½ t	136-140mg = 2¾ t

Chloroquine PO

This table is made calculating **1 tablet = 150 mg of Chloroquine base**

weight Kg	total dose 25 mg/kg mg	dose 1 10mg/kg tablets	dose 2 10mg/kg tablets	dose3 5 mg/kg tablets
5	125mg	¼ t	1/4 t	1/4 t
6-7	150- 175 mg	½ t	1/4 t	1/4 t
8	200 mg	½ t	1/2 t	1/4 t
9-10	225-250 mg	½ t	1/2 t	1/2 t
11	275 mg	3/4 t	3/4 t	1/4 t
12-13	300-325 mg	3/4 t	3/4 t	1/2 t
14	350 mg	1 t	1 t	1/4 t
15-16	375-400 mg	1 t	1 t	1/2 t
17	425 mg	1 t	1 t	3/4 t
18-19	450-475 mg	1 + 1/4 t	1 + 1/4 t	1/2 t
20	500 mg	1 + 1/4 t	1 + 1/4 t	3/4 t
21-22	525-550 mg	1 + 1/2 t	1 + 1/2 t	1/2 t
23	575 mg	1 + 1/2 t	1 + 1/2 t	3/4 t
24-25	600-625 mg	1 + 1/2 t	1 + 1/2 t	1 t
26	650 mg	1 + 3/4 t	1 + 3/4 t	3/4 t
27-28	675-700 mg	1 + 3/4 t	1 + 3/4 t	1 t
29	725 mg	2 t	2 t	3/4 t
30-31	750-775 mg	2 t	2 t	1 t
32	800 mg	2 t	2 t	1 + 1/4 t
33-34	825-850 mg	2 + 1/4 t	2 + 1/4 t	1 t
35	875 mg	2 + 1/4 t	2 + 1/4 t	1 + 1/4 t
36-37	900-925 mg	2 + 1/2 t	2 + 1/2 t	1 t

weight kg	total dose 25 mg/kg mg	dose 1 10mg/kg tablets	dose 2 10mg/kg tablets	dose3 5 mg/kg tablets
38	950 mg	2 + 1/2 t	2 + 1/2 t	1 + 1/4 t
39-40	975-1000 mg	2 + 1/2 t	2 + 1/2 t	1 + 1/2 t
41	1025 mg	2 + 3/4 t	2 + 3/4 t	1 + 1/4 t
42-43	1050-1075 mg	2 + 3/4 t	2 + 3/4 t	1 + 1/2 t
44	1100 mg	3 t	3 t	1 + 1/4 t
45-46	1125-1150 mg	3 t	3 t	1 + 1/2 t
47	1175 mg	3 t	3 t	1 + 3/4 t
48-49	1200-1225 mg	3 + 1/4 t	3 + 1/4 t	1 + 1/2 t
50	1250 mg	3 + 1/4 t	3 + 1/4 t	1 + 3/4 t
51-52	1275-1300 mg	3 + 1/4 t	3 + 1/4 t	2 t
53	1325 mg	3 + 1/2 t	3 + 1/2 t	1 + 3/4 t
54-55	1350-1375 mg	3 + 1/2 t	3 + 1/2 t	2 t
56	1400 mg	3 + 3/4 t	3 + 3/4 t	1 + 3/4 t
57-58	1425-1450 mg	3 + 3/4 t	3 + 3/4 t	2 t
59	1475 mg	4 t	4 t	1 + 3/4 t
60-61	1500-1525 mg	4 t	4 t	2 t
62	1550 mg	4 t	4 t	2 + 1/4 t
63-64	1575-1600 mg	4 + 1/4 t	4 + 1/4 t	2 t
65	1625 mg	4 + 1/4 t	4 + 1/4 t	2 + 1/4 t
66-67	1650-1675 mg	4 + 1/4 t	4 + 1/4 t	2 t
68	1700 mg	4 + 1/4 t	4 + 1/4 t	2 + 1/4 t
69-70	1725-1750 mg	4 + 1/4 t	4 + 1/4 t	2 + 1/2 t

Mefloquine PO

This table is made calculating **1 tablet = 250 mg**
Do not repeat Mefloquine in children < 2 months: it can cause toxicity

WEIGHT Kg	TOTAL DOSE 25mg/kg mg– tablets	FIRST DOSE 15mg/kg tablets	SECOND DOSE 10mg/kg tablets
5-6	125-150 mg = ½ t	¼	¼
7-8	175-200 mg = ¾	1/2	¼
9-11	225-275 mg = 1 t	1/2	½
12-13	300-325 mg = 1¼	3/4	½
14-16	350-400 mg = 1½ t	1 t	½ t
17-18	425-450 mg = 1¾ t	1 t	¾ t
19-21	475-525 mg = 2 t	1 ¼ t	¾ t
22	550mg = 2¼ t	1 ¼ t	1 t
23	575mg = 2¼	1 ½ t	¾ t
24-26	600-650 mg = 2½ t	1 ½ t	1 t
27-28	675-700 mg = 2¾ t	1 ¾ t	1 t
29-31	725-775 mg = 3 t	1 ¾ t	1 ¼ t
32-33	800-825 mg = 3¼ t	2 t	1 ¼ t
34-36	850-900 mg = 3½ t	2 t	1 ½ t
37-38	925-950 mg = 3¾ t	2 ¼ t	1 ½ t

WEIGHT kg	TOTAL DOSE 25mg/kg mg - tablets	FIRST DOSE 15mg/kg tablets	SECOND DOSE 10mg/kg tablets
39-41	975-1025mg = 4 t	2 ½ t	1 ½ t
42-43	1050-1075mg = 4¼ t	2 ½ t	1 ¾ t
44-46	1100-1150mg = 4½ t	2 ¾ t	1 ¾ t
47-48	1175-1200mg = 4¾ t	2 ¾ t	2 t
49-51	1225-1275mg = 5 t	3 t	2 t
52-53	1300-1325mg = 5¼ t	3 ¼ t	2 t
54-56	1350-1400mg = 5½ t	3 ¼ t	2 ¼ t
57-58	1425-1450mg = 5¾ t	3 ½ t	2 ¼ t
59-60	1475-1500mg = 6 t	3 ½ t	2 ½ t
61	1525mg = 6 t	3 ¾ t	2 ¼ t
62-63	1550-1575mg = 6¼ t	3 ¾ t	2 ½ t
64	1600mg = 6 ½ t	3 ¾ t	2 ¾ t
65-66	1625-1650mg = 6½ t	4 t	2 ½ t
67-68	1675-1700mg = 6¾ t	4 t	2 ¾ t
69-70	1725-1750mg = 7 t	4 ¼ t	2 ¾ t

Do not give: Pregnancy; History of mental illness; History of epilepsy; Received Mefloquine in the past 63 days.

Quinine PO

This table is made calculating **1 tablet = 300 mg**

WEIGHT kg	DOSE = 10mg/kg TID	
	mg	Tab
< 5	75 mg BID	¼ BID
6-9	75 mg TID	¼ TID
10-16	150 mg TID	½ TID
17-23	225 mg TID	¾ TID
24-33	300 mg TID	1 TID
34-50	450 mg TID	1 ½ TID
> 50	600 mg TID	2 TID

Artemether - lumefantrine (ALN), Coartem

Each tablet contains 20mg Artemether and 120 mg Lumefantrine.
The regimen is twice daily for 3 days. (give with milk)

Dosage of Coartemether: the dose is dependent on body weight

Body weight (kg)	Number of tablets of Coartem	
≤15	1 tablet per dose	Remark: The bioavailability of oral Lumefantrine is significantly enhanced with co-administration of fat so we would recommend each dose is taken with some fried food or a carton of flavoured milk.
16-25	2 tablet per dose	
26-35	3 tablet per dose	
>35	4 tablet per dose	

Artesunate IV

Use artesunate IV for severe malaria (2,4 mg/kg) or rescue treatment in hyperparasitemia (1,2 mg/kg).
The solution is light sensitive, prepare the solution directly before injection and throw away the excess solution
A suspension is made by dissolving 1 vial in 1 ml 5% sodium bicarbonate
(1 vial contains 60 mg artesunate (60 mg/ml)
Severe Malaria Treatment: H0: Artesunate 2.4 mg /kg ; H12 2.4 mg/kg, and then 2.4 mg/kg/24 hours until the patient can tolerate oral medication

Weight kg	2,4 mg/kg dose (ml)	1,2 mg/kg dose (ml)
2-3	0.1	0.05
4-6	0.2	0.1
7	0.3	0.1
8	0.3	0.2
9-11	0.4	0.2
12	0.5	0.2
13	0.5	0.3
14-16	0.6	0.3
17	0.7	0.3
18	0.7	0.4
19-21	0.8	0.4
22	0.9	0.4
23	0.9	0.5
24-26	1.0	0.5
27	1.1	0.5
28	1.1	0.6
29-31	1.2	0.6
32	1.3	0.6
33	1.3	0.7
34-36	1.4	0.7
37	1.5	0.7
38	1.5	0.8
39-41	1.6	0.8
42	1.7	0.8

Weight kg	2,4 mg/kg dose (ml)	1,2 mg/kg dose (ml)
43	1.7	0.9
44-46	1.8	0.9
47	1.9	0.9
48	1.9	0.9
49-51	2.0	1.0
52	2.1	1.0
53	2.1	1.1
54-56	2.2	1.1
57	2.3	1.1
58	2.3	1.2
59-61	2.4	1.2
62	2.5	1.2
63	2.5	1.3
64-66	2.6	1.3
67	2.7	1.3
68	2.7	1.4
69-71	2.8	1.4
72	2.9	1.4
73	2.9	1.5
74-76	3.0	1.5
77	3.1	1.5
78	3.1	1.6
79-80	3.2	1.6

Quinine IV

Loading dose = 20mg/kg
This table is made calculating
vial of 2cc = 600 mg
IV fluid giving set: 1cc = 20 drops

Loading dose: 20 mg/kg Quinine in 4 hours
Followed by IV fluids alone in 4 hours

You can dilute Quinine in D5W, D10W, D5S and NSS
Use **D10W for pregnant women.**

Weight kg	H0		H4	
	cc of Quinine in IV fluids	drop/mn	IV fluids alone	drop/mn
4-6	0.4 cc in 100 cc	8d/mn	100 cc	8d/mn
7-9	0.6 cc in 150 cc	13d/mn	150 cc	13d/mn
10-12	0.8 cc in 200 cc	17d/mn	200 cc	17d/mn
13-15	1 cc in 250 cc			
16-18	1.2 cc in 250 cc			
19 -21	1.4 cc in 250 cc			
22-24	1.6 cc in 250 cc			
25-27	1.8 cc in 250 cc			
28-31	2 cc in 250 cc			
32-34	2.2 cc in 250 cc			
35-37	2.4 cc in 250 cc	21d/mn	250 cc	21d/mn
38-40	2.6 cc in 250 cc			
41-43	2.8 cc in 250 cc			
44-46	3 cc in 250 cc			
47-49	3.2 cc in 250 cc			
50-52	3.4 cc in 250 cc			
53-55	3.6 cc in 250 cc			
56-59	3.8 cc in 250 cc			
>59	4 cc in 250 cc			

QUININE IV infusion

MAINTENANCE DOSE = 10 mg/kg TID
This table is made calculating**1 vial of 2cc = 600 mg**
IV fluid giving set: 1cc = 20 drops
Note: you can dilute Quinine in D5W, D10W, D5S and NSS
10 mg/kg DOSE:

Weight kg	cc of Quinine in IV fluids	drop/min
4-6	0.2 cc in 100 cc	8d/mn
7-9	0.3 cc in 150 cc	13d/mn
10-12	0.4 cc in 200 cc	17d/mn
13-15	0.5 cc in 250 cc	
16-18	0.6 cc in 250 cc	
19 -21	0.7 cc in 250 cc	
22-24	0.8 cc in 250 cc	
25-27	0.9 cc in 250 cc	
28-31	1 cc in 250 cc	
32-34	1.1 cc in 250 cc	
35-37	1.2 cc in 250 cc	
38-40	1.3 cc in 250 cc	21d/mn
41-43	1.4 cc in 250 cc	
44-46	1.5 cc in 250 cc	
47-49	1.6 cc in 250 cc	
50-52	1.7 cc in 250 cc	
53-55	1.8 cc in 250 cc	
56-59	1.9 cc in 250 cc	
>59	2 cc in 250 cc	

Quinine IM

Loading dose = 20mg/kg
This table is made calculating: **1 vial = 600 mg in 2cc**

1) Dilute 1 vial (2cc) of Quinine in 3 cc of water for injection. It makes 5 cc of solution.
2) Take the quantity you need according to the weight of the patient. Inject half of this dose in each thigh.
3) The injection must be done in very clean condition: wash your hands, clean the thigh with savlon, inject deeply. Otherwise you may provoke an abscess.
4) Tell the patient that injection is going to be painful.

Weight kg	Diluted Quinine GIVE	Weight kg	Diluted Quinine GIVE
4-6	1 cc	**35-37**	6 cc
7-9	1.5 cc	**38-40**	6.5 cc
10-12	2 cc	**41-43**	7 cc
13-15	2.5 cc	**44-46**	7.5 cc
16-18	3 cc	**47-49**	8 cc
19 -21	3.5 cc	**50-52**	8.5 cc
22-24	4 cc	**53-55**	9 cc
25-27	4.5 cc	**56-59**	9.5 cc
28-31	5 cc	**>59**	10 cc
32-34	5.5 cc		

Maintenance dose = 10mg/kg TID
This table is made calculating: **1 vial = 600 mg in 2cc**
Follow above 1-4 steps.
10 mg/kg DOSE:

Weight kg	Diluted Quinine GIVE	Weight kg	Diluted Quinine GIVE
4 to 6 kg	0.5 cc	**35 to 37 kg**	3 cc
7 to 9 kg	0.7 cc	**38 to 40 kg**	3.2 cc
10 to 12 kg	1 cc	**41 to 43 kg**	3.5 cc
13 to 15 kg	1.2 cc	**44 to 46 kg**	3.7 cc
16 to 18 kg	1.5 cc	**47 to 49 kg**	4 cc
19 to 21 kg	1.7 cc	**50 to 52 kg**	4.2 cc
22 to 24 kg	2 cc	**53 to 55 kg**	4.5 cc
25 to 27 kg	2.2 cc	**56 to 59 kg**	4.7 cc
28 to 31 kg	2.5 cc	**> 59 kg**	5 cc
32 to 34 kg	2.7 cc		

Artemether IM

This table is made calculating **1 vial = 80 mg in 1cc**

Weight kg	Loading dose 3.2 mg/kg cc	Maintenance dose 1.6 mg/kg cc	Weight kg	Loading dose 3.2 mg/kg cc	Maintenance dose 1.6 mg/kg cc
2-3	0.1	0.05	**43**	1.7	0.9
4-6	0.2	0.1	**44-46**	1.8	0.9
7	0.3	0.1	**47**	1.9	0.9
8	0.3	0.2	**48**	1.9	1.0
9-11	0.4	0.2	**49-51**	2.0	1.0
12	0.5	0.2	**52**	2.1	1.0
13	0.5	0.3	**53**	2.1	1.1
14-16	0.6	0.3	**54-56**	2.2	1.1
17	0.7	0.3	**57**	2.3	1.1
18	0.7	0.4	**58**	2.3	1.2
19-21	0.8	0.4	**59-61**	2.4	1.2
22	0.9	0.4	**62**	2.5	1.2
23	0.9	0.5	**63**	2.5	1.3
24-26	1.0	0.5	**64-66**	2.6	1.3
27	1.1	0.5	**67**	2.7	1.3
28	1.1	0.6	**68**	2.7	1.4
29-31	1.2	0.6	**69-71**	2.8	1.4
32	1.3	0.6	**72**	2.9	1.4
33	1.3	0.7	**73**	2.9	1.5
34-36	1.4	0.7	**74-76**	3.0	1.5
37	1.5	0.7	**77**	3.1	1.5
38	1.5	0.8	**78**	3.1	1.6
39-41	1.6	0.8	**79-80**	3.2	1.6
42	1.7	0.8			

24.9 DRUG DOSES

PO = oral
IM = intramuscular
IV = intravenous
SC = subcutaneous
PR = per rectum

BID = 2 times/day = every 12 hours
TID = 3 times/day = every 8 hours
QID = 4 times/day = every 6 hours
STAT = one dose only
PV = per vagina

mcg=microgram
mg = milligram
g = gram
kg = kilogram

IU = International Units
S-E = Side effects
Max = Maximum
Start = Starting

General notes

- Length of treatment (= how many days) depends on the infection treated: see the relevant chapter.
- Only more common side-effects are listed. Many drugs can give diarrhoea, nausea and vomiting.
- All drugs can give allergic reactions, rashes and anaphylactic shock (severe allergic reaction).
- Always be careful when you prescribe for a pregnant woman (**see 24.10**).
- If kidney and/or liver functions are not good, be careful when prescribing a full dose of the majority of drugs. Discuss the treatment dose with a doctor.
- When you give two or more drugs at the same time, the working of the drugs may change. The most important interactions are written below.

ACETYL SALICYLIC ACID = ASPIRIN = ASA

CHILD under 12 years	PO	do not use	
CHILD over 12 years	PO	10-15 mg/kg QID	Max 4 g/day
ADULT	PO	300-900 mg QID	Max 4 g/day
Prevention dose		75-100 mg/day	

Be careful: Asthma, G6PD deficiency, dehydration, Gastric pain.
Do not give: Gastric ulcer, Dengue Fever, Gout, Breast-feeding, Final weeks of pregnancy.
Side-effects: Gastric irritation, Increased Bleeding Time, Bronchospasm.
Interaction: NSAID, Corticosteroid, Spironoloactone, Metoclopramide.

ADRENALINE 1:1,000

1 amp = 1 cc = 1 mg. Doses for Anaphylactic shock, Severe Allergic Reactions:

CHILD	< 6 months	IM	0.05 cc
	6 months – 6 years	IM	0.12 cc
	6 –12 years	IM	0.25 cc
CHILD	> 12 years and ADULT	IM	0.5 cc

- IM is the recommended route of injection.
- Dose 0.01 mg/kg (maximum dose 0.5 mg).
- Repeat dose at 5 minutes intervals until BP and pulse are back to normal.
- For babies, dilute the dose with NSS to give usable volume.
- For anaphylaxic shock give adrenaline, even when listed below.

Be careful: DM, heart disease, high BP, thyroid disease.
Interaction: beta-blockers, Tricyclic antidepressants.

- In case of **cardiac arrest** or when the patient is severely ill adrenaline may be given by slow IV injection.

IV Adrenaline (1:1000)	**Cardiac Arrest**
Adult	1mg
Child	0.01mg/kg (=10 mcg/kg)

ALBENDAZOLE

CHILD 1-2 years	PO		200 mg stat	• Repeat dose after 3 weeks if large infestation **Side-effects:** Headache.
ADULT and > 2 years	PO		400 mg stat	
CHILD 1-2 years	PO	*for Strongyloides*	200 mg BD x 3 days	
ADULT and > 2 years	PO		400 mg BD x 3 days	

ALUMINIUM HYDROXIDE

CHILD	PO	25 mg/kg TID or QID	• Take between meals and/or at bedtime. **Interaction: causes reduced absorption** of Ciprofloxacin, Enalapril, Chloroquine, Digoxin, Doxycycline, Isoniazid, (Nor)(O)floxacin, Phenytoin, Rifampicin, Tetracycline.
ADULT	PO	500 mg-1g TID or QID	

AMINOPHYLLINE

ADULT	PO	100-300 mg TID or QID	• Take after food. • Oral Aminophylline is **not very effective** in controlling asthma. If possible, use steroid inhalers (plus Salbutamol inhaler).

		Loading dose	**Maintenance dose**	
CHILD	infusion	5 mg/kg over 30 minutes	1 mg/kg/hour	• Dilute in D5W or NSS • Do not give loading dose if patient already taking oral Aminophylline. **Be careful:** Cardiac disease, Hypertension, Epilepsy, Hyperthyroidism, Peptic ulcer. **Side-effects:** Tachycardia, Palpitations, Headache, Insomnia, Arrhythmias, Convulsions. **Interactions:** ciprofloxacin, cimetidine, erythromycin, anti epileptics, corticosteroids
ADULT	infusion	250 mg over 30 minutes	0.5 mg/kg/hour	

AMITRIPTYLINE

CHILD (>11 years)	PO	0.1 mg/kg at night; may advance as tolerated over 2-3 weeks to 0.5-2.0 mg/kg HS	**Be careful:** Old people, diabetes patients (loss of glucose control). **Use with caution in patients with:** Cardio Vascular disease, urinary retention, glaucoma, hyperthyroid. **S-E:** sedation, urinary retention, blurred vision, elevated heart rate, orthostatic hypotension, agitation, confusion. **I. increases effect** of CNS depressant drugs (including alcohol). **Interaction:** cimetidine, verapamil, chlopromazine increase effect of A. Withdrawal reaction if abruptly stopped: nausea, headache, malaise.
ADULT	PO	10-25 mg at night; may increase as tolerated to 100mg/day	

AMOXICILLIN

CHILD	PO	10-25 mg/kg TID	**Be careful:** history of allergy. **S-E:** patients with glandular fever can develop a severe rash. Do not usually give for sore throat.
ADULT	PO	250 mg-1g TID	

Treatment scheme

Age Group	Dose: Mild – Moderate Infections		Dose: Severe Infections		Frequency
	mg	cc / tablets	mg	cc / tablets	
0 - 1 year	62.5mg	2.5cc	125mg	5cc = ½ tablet	TID
1 - 5 year	125mg	5cc = ½ tablet	250mg	10cc = 1 tablet	TID
6 - 12 year	250mg	10cc = 1tablet	500mg	2 tablets	TID
Adult	500mg	2 tablets	1g	4 tablets	TID

AMPICILLIN

CHILD	PO	10-25mg/kg TID	• Take at least 30 minutes before food. Less than half dose is absorbed and absorption is worse if taken with food. If available, prefer Amoxicillin. **Be careful/SE:** see Amoxicillin.
ADULT	PO	500mg-1g TID	

CHILD	1st week of life	IM/IV	25 mg/kg BID	**severe infections IM/IV**	50 mg/kg BID
	week 1-3	IM/IV	25 mg/kg TID		50 mg/kg TID
	after 3rd week	IM/IV	25 mg/kg QID		50 mg/kg QID
ADULT		IM/IV	500 mg QID		1-2 g QID

ATENOLOL

		Start dose	
ADULT	PO	25-50 mg OD, may increase to 100mg/day	**Be careful/side-effects:** see propanolol. doses over 100 mg/day are not cardio selective, i.e. will have same se and precautions as propanolol with asthma & diabetes patients.

AZITHROMYCIN

CHILD	PO	10 mg/kg OD	**Be careful:** in patients with liver function problem **Side-effects:** gastro-intestinal disturbance, allergic reaction. **Interaction:** do not give together with arthemeter, aluminium hydroxide.
ADULT	PO	250 mg OD Day 1 double dose	
for STD	PO	1 gram STAT	

BENZATHINE PENICILLIN

CHILD	IM	streptococcal tonsillitis acute rheumatic fever	25.000-50.000 IU/kg STAT (Max1.2 million IU)
	IM	rheumatic fever prophylaxis	25.000-50.000 IU/kg every 4 weeks (max 1.2 million IU/dose)
ADULT	IM	streptococcal tonsillitis acute rheumatic fever	1.2 million IU STAT
	IM	rheumatic fever prophylaxis	1.2 million IU every 4 weeks
	IM	early syphilis/ulcer	2.4 million IU STAT (in 2 injections sites)

Be careful: kidney functions abnormal. **S-E:** allergic reactions, blood disorders.

BENZYLPENICILLIN

CHILD	1st week of life	IM/IV	25 mg/kg BID	**Severe infections (meningitis) IM/IV**	50 mg/kg BID	**Be careful/ side-effects:** see benzathine penicillin.
	1st-4th week of life	IM/IV	25 mg/kg TID		50 mg/kg TID	
	> 4 weeks of life	IM/IV	25/mg/kg QID		50-75 mg/kg QID	
ADULT		IM/IV	600mg-1.2g QID		2.4 g QID	

BUSCOPAN (HYOSCINE BUTYLBROMIDE)

CHILD	< 6 years	**not recommended**			**Be careful in:** children, old people, hypertension, reflux disease, diarrhoea. **Side-effects:** constipation, heart rhythm problem, urinary urgency and retention, dry mouth, confusion. **Interaction:** erythromycin, antipsychotics, metoclopramide.
	> 6 years	PO	**not recommended**		
		IM / IV	5-10 mg / dose	Max 30 mg/daily	
ADULT		PO	20 mg QID		
		IM / IV	20 mg / dose Can repeat the dose in 30 min.	Max 100 mg/daily	

CARBAMAZEPINE

		Start dose	Max dose	
CHILD	PO	5 mg/kg OD, increase by 2.5 mg to 5/mg/kg TID	20mg/kg/day	• do not stop suddenly: decrease slowly: **see 20.3**. **Be careful in:** heart disease, liver and kidney disease. **Side-effects:** dizziness, drowsiness, confusion, double vision, low sodium, low red blood cells, low platelets, low white cells. **Interaction:** c. reduces effect of: doxycycline, steroids, contr. pill. c. effect reduced by: chloroquine and mefloquine.
ADULT	PO	100 mg BID	2 g	

CEFALEXIN

CHILD	PO	10 mg/kg TID	severe infections	12.5-25 mg/kg QID	**Do not give, Side-Effects:** see ceftriaxone.
ADULT	PO	500 mg TID		1 g QID	

CEFTRIAXONE

CHILD	IM / IV	25mg/kg OD	**severe infections**	50 -80 mg/kg OD	• doses > 50 mg/kg only IV. • give IV by infusion or slowly over 2-4 min. • IM dose > 1 gram divide between more than one site. **Be careful:** premature neonates, dehydration. **Do not give:** neonates with jaundice. **Side-Effects:** headache.
ADULT	IM / IV	1g OD		1-2g OD or BID	
	IM	gonorrhoea		250 mg STAT/OD	

CHLORAMPHENICOL

CHILD	PO	12.5 mg/kg QID	• Use only in serious cases (like meningitis, **see 15.1**). • Reduce the dose as soon as patient is better, to decrease possibilities of toxicity. **Be careful:** neonates, G6PD deficiency. **Do not give:** pregnancy and breast-feeding. **Toxicity:** aplastic anaemia, bone marrow suppression, circulatory collapse.
ADULT	PO	500 mg QID	

CHILD 1-2 week	IV/IM	**severe infections**	12.5 mg/kg BID	• **half the dose** when patient is getting better.
2 –4 weeks			12.5 mg/kg BID - QID	
> 4 weeks			25 mg/kg QID	
ADULT	IV/IM		25 mg/kg QID (max 1g QID)	

CHLORPHENIRAMINE

CHILD	< 1 year	**not recommended**		
	1-2 years	PO	1 mg BID	Max 3 mg/day
	3-5 years	PO	1 mg every 4-6 hours	Max 6 mg/day
	6-12 years	PO	2 mg every 4-6 hours	Max 12 mg/day
ADULT		PO	4 mg every 4-6 hours	Max 24 mg/day
		IV	10-20 mg dose	Max 40 mg/day

- give for allergies.
- after anaphylactic shock, give for 2 days oral to prevent relapse.

Be careful: prostatic hypertrophy, urinary retention, epilepsy.
Side-Effects: drowsiness, headache, urinary retention, dry mouth, palpitation, confusion, tinnitus.

Chlorpheniramine Maleate (IV/IM) – vial 10 mg/ml

CHILD	< 1 year	Not recommended		
	1–5 years	IV/IM	3 mg	0.3 cc
	6–12 years	IV/IM	8 mg	0.8 cc
ADULT		IV/IM	20 mg	2 cc

- **Dose:**
  Child: 200 micrograms/kg STAT.
  Adult: 10-20 mg over 1 minute STAT (maximum dose 40 mg).
- **IV/IM is** the recommended route of injection.

CHLORPROMAZINE

Psychoses, severe anxiety, violent behaviour		**Start dose**
ADULT	PO	25mg TID or 75mg at night
	IM	25-50 mg TID or QID

- Old people: half adult dose. Usually 10-25 mg OD or BID is enough for agitated states.
- Risk of contact allergy: do not touch crushed tablets; do not touch solution with hands.
- Do not stop suddenly: decrease slowly.
- After IM injections, patient should lie down for 30 minutes.

Be careful in: heart and lung disease, acute infections, history of jaundice, old people.
Do not give: pregnancy, severe kidney or liver disease, epilepsy. stop treatment if patient develops fever.
Side-Effects: tremor, abnormal movements, restlessness, drowsiness, nightmares, depression, jaundice, convulsions, blurred vision, difficulty in passing urine, hypotension, tachycardia, respiratory depression, anaemia.
C. effect increased by: alcohol, anti-inflammatories, pentazocine.

CIMETIDINE

ADULT	PO	400 mg BD x 4-6 weeks	**Be careful in:** Liver and Kidney disease. **Side-Effects:** diarrhoea, nausea, headache, dizziness, rash, tiredness. **Do not give:** pregnancy. **Do not give together with:** phenytoin and aminophylline.

CIPROFLOXACIN

1. For Typhoid Fever, Pyelonephritis and severe Bacteria Dysentery = 10 mg / kg BID for 5-10 days

CHILD	PO	125 mg BID	**Be careful in:** Epilepsy, G6PD deficiency. **Side-Effects:** abdominal pain, dizziness, sleep disorders, convulsions, jaundice, renal failure. • Reduced absorption by aluminium, ferrous sulphate.
ADULT: < 40 kg	PO	250 mg BID	
> 40 kg	PO	500 mg BID	

2. For Chancroid: see also 13.5

ADULT	PO	for Chancroid	500 mg BID x 3 days

CLOXACILLIN (see below)

CHILD	PO IV IM	15 mg/kg QID	**severe infections IV**	1st week	50mg/kg BID	• Absorption is not very good: if possible take 1 hour before or 2 hours after meals. **Side-Effects:** jaundice haemolytic anaemia. **C. can reduce effect** contr. Pill.
				2-4 weeks	50 mg/kg TID	
				> 4 weeks	50 mg/kg QID	
ADULT		500 mg QID		ADULT	1-2g QID	

Treatment scheme cloxacillin

Age Group	Dose: Mild – Moderate Infections		Dose: Severe Infections		Frequency
	mg	cc / tablets	mg	cc / tablets	
0 - 2 year	62.5mg	2.5cc	125mg	5cc = ½ tablet	QID
2 - 9 year	125mg	5cc = ½ tablet	250mg	10cc = 1 tablet	QID
10 year - Adult	250mg	10cc = 1tablet	500mg	2 tablets	QID

CODEINE

CHILD	PO	0.5 mg/kg every 4 hours		See Pain chapter, **7.5**. **Side-Effects:** see pentazocine.
ADULT	PO	30-60 mg every 4 hours	Max 240 mg/day	

COTRIMOXAZOLE

CHILD: up to 5 months	PO	120 mg BID	**double in severe infections**	• For prophylactic use in HIV patients, **see 15.3**. **Be careful in:** asthma, G6PD deficiency, Pregnancy. **Do not give:** blood disorders, liver/ kidney failure. **Side-Effects:** low platelets, low WBC: **Stop. C**. increases effect of glibenclamide.
6 months – 5years	PO	240 mg BID		
6-12 years	PO	480 mg BID		
ADULT	PO	960 mg BID		

DEXAMETHASONE

slow IV/IM 1 amp = 1cc = 4 mg

*** Doses for Anaphylactic shock, severe Allergic reactions:**

CHILD	< 8 kg	IV / IM	1 mg	0.25 cc
	8-15 kg	IV / IM	3 mg	0.75 cc
	15 -30 kg	IV / IM	5 mg	1.25 cc
	>30 kg	IV / IM	8 mg	2 cc
ADULT		IV / IM	12 mg	3 cc

*** For maturation of the lungs of a fetus in premature labour:** dexamethasone IM 24 mg in 24 hours (8 mg IM TID)

DEXTROSE 50%

CHILD and ADULT	slow IV	1 ml / kg	The solution is an irritant to veins: give via a large vein and large cannula.

DIAZEPAM

See treatment doses 7.2

CHILD	PO	0.04 – 0.2 mg/kg BID or TID	• Give IV dose slowly; max 0.5 cc in 30 seconds. • Do not give for long periods. Dependence and tolerance develop after 2 weeks of use. At the end of the treatment reduce dose slowly to avoid withdrawal reactions. • See **Convulsions chapter, 7.2**. • For alcohol withdrawal, **see chapter, 23.1** **Be careful:** respiratory diseases; drug/alcohol abuse. **Do not use:** respiratory depression, asthma, liver failure, depression, chronic psychosis. **Do not give w ith:** chlorpheniramine, phenytoin.
	PR	0.5 mg/kg stat	
	IV	0.3 mg/kg stat (Max 3mg/kg/day)	
ADULT	PO	2-10 mg BID or TID	
	IV / PR	10-20 mg STAT	

DICLOFENAC

CHILD	PO	1 mg / kg BID or TID	Max 50 mg/day	• **Side-Effects:** See ibuprofen.
ADULT	PO	25-50 mg TID	Max 150 mg/day	
	IM	75 mg OD		

DIGOXIN

Note: Digoxin should only be used in patients with heart failure who have atrial fibrillation or who are still symptomatic on the other recommended medication used for heart failure.

ADULT	PO	0.125 - 0.250 mg OD	**First dose: Heart Failure** chapter (**see 8.2**) **Be careful:** thyroid disease, old people, low potassium, (if given with diuretic, prefer spironolactone). **Side-Effects:** nausea and vomiting, vision problems, headache, drowsiness, confusion depression. **D. effect increased by:** erythromycin, quinine. **Risk: side effects** are increased if given with drugs decreasing potassium levels in the blood like Furosemide, Hydrochlorothiazide, Steroids, Propranolol..
OLD PEOPLE	PO	0.0625 - 0.125 mg OD	

DOXYCYCLINE

CHILD < 8 years	**not recommended***		**Side-Effects:** allergic reactions, headache. **Do not give:** pregnancy, children < 8 yrs. **D. absorption reduced by:** aluminium, iron. **D. effect reduced by:** carbamazepine, phenobarbital, Phenytoin. *** Exception:** scrub typhus **see 15.1**.
CHILD > 8 years and ADULT	PO	2 mg/kg BID or 4 mg/kg OD	

ENALAPRIL

		Start dose	Max dose	
ADULT	PO	5 mg OD	40 mg OD	See **Hypertension** chapter, **8.1**. **Be careful:** Using other diuretics, abnormal kidney function. **Do not give:** pregnancy. **S-E:** severe hypotension, abnormal kidney function, dry cough. Risk of high potassium, especially when used with spironolactone. **E. absorption reduced by:** aluminium. **E. effect increased by:** alcohol, nitrates: other anti-HBP drugs.
OLD PEOPLE	PO	2.5 mg OD	40 mg OD	

ERGOMETRINE

Incomplete abortion and post-partum haemorrhage:

ADULT	IM or slow IV	0.2 mg stat	• In PPH you can repeat the dose 2 more times if bleeding continues. • IV is faster, but should be given over 1 minute. • see Common Obstetric Problems chapter, **19**.

Do not give: high blood pressure and eclampsia (give oxytocin), 1st and 2nd stage of labour.
S-E: rise in BP, nausea/vomiting, headache, dizziness, tinnitus, abdominal pain, chest pain, palpitations, tachycardia.

ERYTHROMYCIN

CHILD	10 mg / kg QID PO	**severe infection**	15-25 mg/kg QID	• You can use E. in patients allergic to penicillin. **Side-Effects:** diarrhoea, rashes. **If possible do not give with**: aminophylline, carbamazepine, cimetidine, digoxin.
ADULT	250-500 mg QID PO		750mg-1g QID	

ETHAMBUTOL

Use ONLY for TB treatment together with other drugs (never alone) See **TB Chapter, 21.5**.

CHILD and ADULT	PO	15-20 mg/kg OD	• Test visual acuity before giving and at every follow-up visit. **Be careful:** reduce dose in kidney disease, old people. **Do not give:** poor vision, deaf. **Side-Effects:** eye toxicity, peripheral neuritis, skin rash.

FERROUS SULPHATE

Treatment dose: see chapter anaemia, **14.1**

CHILD up to 5 kg	PO	50 mg BD	• Stools become black in colour. **Side-Effects:** gastric irritation, constipation. **FS reduces absorption of: ciprofloxacin, doxycycline.** **FS reduces effect of: methyldopa.**
CHILD 5-15 kg	PO	100-200 mg BD	
CHILD > 15 kg ADULT	PO	200 mg TID	

- After Hb is back to normal, 3 more months or therapy are needed to fill the iron stores in the body.
- If a breast-fed baby is anaemic: give ferrous sulphate and folic acid to the mother.

Prophylactic dose

CHILD up to 5 kg	PO	50 mg OD
CHILD 5-15 kg	PO	100 -200 mg OD
CHILD > 15 kg ADULT	PO	200 mg OD

FLUCONAZOLE

For Treatment and Prophylaxis of Opportunistic Infections in HIV patients: see **AIDS chapter, 15.3**

CHILD	PO	2-4 mg/kg/day	• Doses depend on indication in HIV opportunistic infections (e.g. Stomatitis or cryptococcal meningitis).
ADULT	PO	100-800 mg OD	

FOLIC ACID

Treatment dose Prophylactic dose

CHILD	PO	½ tab OD (2.5 mg OD)	PO	2.5 mg / week
ADULT	PO	1 tab OD (5 mg OD)	PO	5 mg/week

FUROSEMIDE

CHILD	PO	nephrotic syndrome	1 mg/kg OD	
	slow IV	heart failure, hypertensive crisis	1 mg/kg	Max 20 mg /day
ADULT	PO	oedema	20-80 mg daily	
	PO	nephrotic syndrome	1 mg/kg OD	
	slow IV	**heart failure**	**40-80 mg/ dose**	

- See **Nephrotic Syndrome** and **Hypertension** chapters, **13.4 and 8.1.**
- Often the cause of oliguria is dehydration: if patient is dehydrated, give bolus of normal saline before furosemide.
  Be careful in: hypotension, liver failure.
  Side-Effects: low sodium and low potassium, Hypotension, High glucose.
  Do not give with: Indomethacin (increased risk of kidney toxicity/ indomethacin decreases diuretic effect).
  If possible, do not give with: gentamicin and streptomycin (see Gentamicin)
  F. effect decreased by: contraceptive Pill.
  F. decreases effect of: anti-diabetics.
  Risk of low potassium increased if used with: steroids.

GENTAMICIN

Neonates (<2 months)	IV/ IM	4 mg / kg OD	**Be careful:** Old people, kidney failure (reduce dose in severe kidney failure). **S-E:** Ear and kidney toxicity. **Interaction:** if possible, do not give with Furosemide. If you have to, give one drug in the morning and one in the evening.
ADULT and CHILD > 2 months	IV/ IM	7 mg / kg OD (use actual body weight; if obese, subtract 20% actual weight to use for dosing weight)	

GLIBENCLAMIDE

		Start dose	Max dose	
ADULT	PO	5 mg OD	15 mg OD	• Can give with metformin. **Be careful:** old people can develop hypoglycaemia easily. **Do not give:** breast-feeding. **Side-Effects: Hypoglycaemia:** flushing after alcohol intake.
OLD PEOPLE	PO	2.5 mg OD	15 mg OD	

GRISEOFULVIN

CHILD	PO	10-20 mg/kg OD	• Avoid pregnancy during and for one month after treatment. Men should not make their wives pregnant during and for 6 months after treatment. • Take after meal. **Side-Effects:** headache, dizziness, blood disorders. **Do not give:** pregnancy, severe liver disease. **Interaction:** G. reduces effect of contraceptive Pill.
ADULT	PO	500mg OD	

HALOPERIDOL

psychoses, mania, violent behaviour			Oral doses can be 3-5 mg for severely affected patients. • Old people: half dose. **Be careful in:** see chlorpromazine. **Do not give:** see chlorpromazine. **Side-Effects:** See chlorpromazine. **Interaction: If possible do not give with Indomethacin** (causes severe drowsiness).
ADULT	PO	1.5-3 mg BID or TID	
	IM	2-10 mg dose	
short-term for severe anxiety			
ADULT	PO	0.5 mg BID	
intractable hiccup			
ADULT	PO	1.5 mg TID	

HYDRALAZINE

		Start dose	Max dose		
ADULT	PO	25mg BID	50mg BID		• See **Hypertension chapter** (**8.1, 19.5**). **Do not give:** stroke, renal disease. Pulse Rate >140/min. **Side-Effects:** tachycardia, nausea, vomiting, palpitations, hypotension, headache, dizziness. **When given IV**: rapid and severe drop in BP. **H effect increased by**: alcohol, other anti-HBP drugs. **H effect decreased by**: anti-inflammatory, steroids, contraceptive Pill.
Hypertensive crisis:					
ADULT	IV	5mg Repeat every 20-30 minutes until diastolic <110 mmHg		Max Dose 20 mg	

HYDROCHLOROTHIAZIDE

		Start dose	Max dose	• See **Hypertension Chapter** (**8.1**). **Side-Effects:** low potassium (not at low doses), high glucose. **Do not give:** severe renal and liver failure, gout, pregnancy. **Other effects:** see **furosemide.**
ADULT	PO	12.5 mg OD	50 mg OD	

HYDROCORTISONE

In case of allergy or asthma:
Hydrocortisone sodium succinate (IM/ slow IV) – 1 vial = 100 mg

CHILD	< 1 year	IV/IM	25 mg /4-6H	• Dose: Child: 2 mg/kg every 4 hour. • Adult: 250 mg every 4 hour. **IM or slow IV is** the recommended method of injection.
	1year – 5 year	IV/ IM	50 mg /4-6H	
	6 year – 12 year	IV/IM	100 mg /4-6H	
ADULT		IV/IM	250 mg /4-6H	

IBUPROFEN

CHILD	PO	2.5-10 mg/kg TID or QID	**Be careful:** old people, abnormal kidney function, asthma. **Do not give:** pregnancy/ breastfeeding, allergy to ASA, peptic ulcer. **Side-Effects:** gastric irritation and bleeding, bronchospasm, headache, dizziness, haematuria, oedema, renal failure. **I. decreases effect of:** anti-hypertensive drugs. **With Diuretics:** I. increases risk of kidney toxicity. **With Steroids:** I. increases risk of gastric ulcer.
ADULT	PO	150-600 mg TID or QID	

INDOMETHACIN

CHILD		Not recommended	See **ibuprofen**. Take with food. **Interaction:** do not give with haloperidol and furosemide.
ADULT	PO	25-50 mg TID or QID	

ISONIAZID

Use only for TB treatment together with other drugs (never alone)*:

CHILD	PO	5-10 mg/kg OD	*See **TB Chapter** (**21.5**). **Be careful:** liver and kidney disease, epilepsy, psychosis, alcoholism. **Side-Effects:** peripheral neuropathy (to prevent, give 10mg OD vitamin B6); eye toxicity; liver toxicity; convulsions; psychosis. **I. increases effect** of carbamazepine and phenytoin.
ADULT	PO	300 mg OD	

ISOSORBIDE MONONITRATE

		Start dose	Max dose	
ADULT	PO	10 mg BID	30 mg QID	**Be careful:** hypothyroidism. **Do not give:** hypotension, heart valve problems, severe anaemia. **Side-Effects:** severe headache, flushing, hypotension, tachycardia.

MEBENDAZOLE

CHILD > 1 years ADULT	PO	100 mg BID x 3 days	**Do not give:** pregnancy first trimester, children < 1 year.

METFORMIN

		Start dose	Max dose	
ADULT	PO	500 mg TID	1 g TID	• See **Diabetes** Chapter, **10.1**. • Can give with Glibenclamide.

Do not give: pregnancy, breastfeeding, abnormal kidney functions, heart failure, alcoholism.
Hypoglycaemic effect increased by alcohol, cimetidine, propranolol.
Hypoglycaemic effect decreased by: steroids, hydrochlorothiazide, furosemide, contraceptive pill.

METHYLDOPA

		Start dose	Max dose
ADULT	PO	250 mg BID	3g daily
OLD PEOPLE	PO	125 mg BID	2g daily

- See **Hypertension** chapter (**8.1**).

Do not give: depression, active liver disease.
Side-Effects: nausea, stomatitis, dry mouth, oedema, sedation, headache, nightmares, jaundice, anaemia, bone marrow depression.
M effect increased by: alcohol, propranolol, other anti-hypertensives.
M effect reduced by: anti-inflammatories, steroids, iron, contraceptive Pill.

METOCLOPRAMIDE

CHILD	PO/ IM / IV	0.12 mg/kg each dose (TID)
ADULT	PO/ IM / IV	10-15 mg each dose (TID or QID)

Be careful: children and old people.
Side-Effects: tremor, abnormal movements, restlessness, drowsiness.

METRONIDAZOLE

CHILD	first month	PO/ IV	7.5 mg / kg BID
	>1 month	PO/ IV	7.5 mg / kg TID
ADULT		PO/ IV	500 mg TID
	for Amoeba	PO/ IV	750 mg TID

Be careful: if alcohol taken together can give bad reaction.
Side-Effects: unpleasant taste, gastric irritation, headache, jaundice.
Increases effect of: phenytoin.

METOPROLOL

		Start dose	Max dose
ADULT	PO	25 mg OD-BID, may increase to 100 BD mg/day	100 mg OD

Doses for heart failure see 8.2 Be careful/
Side-Effects: see propanolol.
Doses over 100 mg/day are not cardio selective, i.e. will have same SE and precautions as propanolol with asthma & diabetes patients.

NICLOSAMIDE

CHILD < 10 kg	PO	500 mg stat
11-35 kg	PO	1 gram stat
ADULT	PO	2 gram stat

- Before niclosamide, give metoclopramide 10 mg PO when patient wakes up.
- Chew the tablets before swallowing.

NITROFURANTOIN

CHILD < 3 months	Not recommended	
> 3 months	PO	1.5 mg/kg QID
ADULT	PO	50-100 mg QID

- For UTI.

Do not give: in G6PD deficiency, last weeks of pregnancy.
Side-Effects: gastro intestinal problems.

NORFLOXACIN

ADULT	PO	400 mg BID	• Used in UTIs not responding to Cotrimoxazole and Cephalexin. **Be careful, Side-Effects and Reduced absorption:** see Ciprofloxacin.

NYSTATIN

CHILD	to suck in mouth	100,000 IU QID
ADULT	to suck in mouth	100,000 IU QID
	PV	100,000 -200,000 IU at night high in the vagina

OMEPRAZOLE

ADULT	PO	20-40 mg OD	**Be careful:** in liver disease and pregnancy. **Side-Effects:** gastro intestinal disorders.

OXYTOCIN (syntocinon)

ADULT	Incomplete Abortion	IV	10-20 IU stat	• For induction of labour see Obstetric guidelines. • See Common Obstetric Problems (**19**). **Side-Effects:** uterine spasms, nausea, vomiting, arrhythmias.
	Post Partum Haemorrhage	IV / IM	10 IU stat, then 20 IU in 500 cc NSS at 30 drops/min. Reduce as haemorrhage slows.	

PARACETAMOL (ACETAMINOPHEN)

CHILD	PO	15 mg / kg QID	Max 2 g/day	• It can also be given **4 hourly**, but respect the maximum dose. **Be careful:** alcoholism, liver failure. **Side-Effects:** rare. Liver damage if over dosage.
	PO	5 mg/kg QID if jaundice		
	IM	10 mg/kg QID		
ADULT	PO	500mg - 1g QID	Max 4 g/day	
	IM	300 mg QID		

PENICILLIN V (PHENOXYMETHYLPENICILLIN)

CHILD	PO	7.5-15mg/kg QID	• For suspected streptococcal tonsillitis: give therapy **for 10 days** to prevent rheumatic fever. **Be careful, Side-Effects:** see benzathine penicillin
ADULT	PO	250-500 mg QID	

PENTAZOCINE

Since 2006 you can not order Pentazocine in Thailand.

CHILD	SC / IM slow IV	0.5-1 mg/kg /dose		• it can be repeated every 3-4 hours, but respect the maximum dose. **Do not give:** acute asthma attack, acute alcoholism, head injury, meningitis, brain haemorrhage, acute respiratory depression. **Be careful in:** hepatic failure, convulsions. **Side-Effects:** nausea and vomiting, constipation and drowsiness, respiratory depression, hypotension.
ADULT	SC / IM slow IV	30-60 mg/dose	Max 360 mg/day	

PHENOBARBITAL (PHENOBARBITONE)

Epilepsy		**Start dose**	**Max dose**	• Do not stop suddenly: decrease slowly. **Be careful:** children and old people; may cause sedation: tell patients who work with machinery or driving. **Do not give:** Severe respiratory depression.
CHILD	PO	5 mg/kg at night	8mg/kg	
ADULT	PO	60 mg at night	180 mg	

Generalised convulsions (if diazepam can not control fitting) **After IV loading dose: refer**

		Loading dose	**Side-Effects:** drowsiness, lethargy, excitement in children, confusion in old people, hypotension (especially IV), rash, blood disorders, respiratory depression and arrest (especially fast IV). **Overdosage:** Unsteady walk, not clear speech. **P reduces effect of:** chloramphenicol, doxycycline, metronidazole, steroids.
CHILD	Infusion	10-20 mg/kg over 30m	
ADULT	IV	10 mg/kg over 30 min	

PHENYTOIN

Epilepsy		**Start dose**	**Max dose**	• Do not stop suddenly: decrease slowly. • Better with or after food. **Be careful:** hypotension, heart failure, liver failure (give smaller dose). **Do not give:** bradycardia. **Side-Effects:** mental confusion, dizziness, headache, tremor, insomnia, depression, swollen gums, anaemia. **Overdosage:** not clear speech, unsteady walk, nystagmus, not clear vision, changed behaviour. **P effect increased by:** aspirin, chloramphenicol, cotrimoxazole, metronidazole, isoniazide, cimetidine **P reduces effect of:** doxycycline, steroids, contraceptive pill, aminophylline.
CHILD	PO	2.5 mg/kg BID		
		Usual maintenance		
Neonates	PO	5-8mg/kg/24hr in 2-3 doses	300 mg /24 hr	
6 mnts-3 yr	PO	8-10 mg/kg/24hr in 2-3 doses		
4-6 years	PO	7.5-9 mg/kg/24hr in 2-3 doses		
7-9 years	PO	7-8 mg/kg/24 hr in 2-3 doses		
10-16 years	PO	6-7 mg/kg/24 hr in 2-3 doses		
ADULT	PO	200-300 mg/24 hr in 1-2 doses		
		Usual maintenance		
		200-500 mg/24 hr in 1-2 doses	500 mg/24 hr in 1 or 2 doses	

Generalised convulsions (if Diazepam can not control fitting)

		Loading dose	Maintenance	Max
CHILD and ADULT	Infusion	15 mg/kg over 1 hour	see PO start dose	1.5 g

PRAZIQUANTEL

CHILD and ADULT	PO	for Taenia	20 mg/kg stat	• Can use in 2nd and 3rd trimester of pregnancy.
		for Paragonimus	25 mg/kg TID x 3 days	

PREDNISOLONE

See **Asthma, Nephrotic Syndrome and Rheumatic Fever**: Chapters, **21.4, 13.4 and 8.4**.

CHILD	PO	1 -2 mg/kg OD	**Side-Effects**: hypokalemia, fluid retention. **Do not use:** peptic ulcer, bacterial infection not controlled by antibiotics. **Note:** deworm when you start treatment.
ADULT	PO	0.5 – 1.5 mg/kg OD	

In case of prolonged treatment do not stop suddenly, decrease dose slowly
In case of rheumatic fever higher doses are prescribed, **see 8.4.**

PRIMAQUINE

CHILD	PO	0.25 -0.5 mg/kg OD for 14 days 0.75 mg/kg once weekly for 8 weeks	**Be careful**: G6PD deficiency, rheumatoid arthritis. **Side-Effects**: abdominal pain, haemolytic anaemia especially in G6PD deficiency. **Do not use**: pregnancy and breastfeeding. **Note**: weekly treatment is safe also in G6PD-deficiency.
ADULT	PO	15 mg -30 mg OD for 14 days 30 mg once weekly for 8 weeks 45 mg once weekly for 6 weeks	

PROCAINE PENICILLIN (PENICILLIN G PROCAINE) 1mg=1,000 IU

CHILD	Deep IM	25-50 mg/kg OD or BID	• Not for IV. See under Benzathine Penicillin
ADULT	Deep IM	600mg-2.4g OD or BID	

PROPYL THIO URACIL (PTU)

Adult	PO	200-400 mg OD	• Give until TSH is normal, then reduce dose (e.g. 50 -150 mg OD). **Caution:** pregnancy. **Side-Effects:** gastro-intestinal disorders, rare bone marrow depression.

PROPRANOLOL

			Start dose	Max dose	
ADULT	PO	Hypertension	40 mg BID	160mg BID	**Do not give:** asthma, obstructive airways disease, bradycardia (HR<50), hypotension. **Be careful in:** pregnancy and breastfeeding, liver and kidney disease (give smaller dose), diabetes **Side-Effects:** bradychardia, heart failure, hypotension, bronchospasm, sleep disturbances, cold hands/f feet. **Interaction: do not give with aminophylline.** **P effect reduced by:** anti-inflammatories, rifampicin, steroids, contraceptive Pill. **P increases effect of:** anti-diabetics.
	PO	Angina	40 mg BID or TID	120 mg BID	
	PO	Arrhythmias Thyrotoxicosis	10-40 mg TID or QID		
	PO	Anxiety with palpitations, Tremor	40 mg OD	40 mg TID	

PYRAZINAMIDE

Use only for TB treatment together with other drugs (never alone)*:

CHILD		PO	20-30 mg/kg OD	* See **TB Chapter (21.5)** **Be Careful**: liver disease, diabetes, gout. **Do not give**: jaundice. **Side-Effects**: liver toxicity, joint pain, nausea, vomiting. skin rash.
ADULT	< 50 kg	PO	1500 mg OD	
	> 50 kg	PO	2000 mg OD	

RIFAMPICIN

Use only for TB treatment together with other drugs (never alone)*: * See **TB Chapter**, **21.5**

CHILD		PO	10 mg/kg OD	• R gives an orange colour to body fluids urine, sweat and tears. **Be careful**: liver disease. **Do not give**: jaundice. **Side-Effects**: liver toxicity, nausea, vomiting, diarrhoea, skin rash. **Decreased absorption by:** aluminium. **R decreases effect of**: chlorpropamide, phenytoin, propranolol, steroids, contraceptive Pill, aminophylline, cimetidine.
ADULT	< 50 kg	PO	450 mg OD	
	> 50 kg	PO	600 mg OD	

SALBUTAMOL

see **Asthma Chapter**, **21.4**

CHILD	PO	0.1mg/kg QID
	resp solution 5mg/ml, 0.5%	2.5 – 5 mg / dose*
	inhaler 1 puff=100 mcg	1-2 puffs / dose*
	IM / SC	0.01 - 0.02mg/kg every 4-6 hrs
ADULT	PO	2 - 4 mg TID or QID
	resp solution 5mg/ml, 0.5%	2.5 – 5 mg / dose*
	inhaler 1 puff=100 mcg	1 - 2 puffs / dose*
	IM / SC	0.5 mg every 4-6 hours
	very slow IV	0.250 mg repeated if necessary

- **Oral intake of the drug** is **less effective and has more side effects than the inhaler or nebuliser**: if available, give inhaler / nebuliser.

Be careful in: hyperthyroidism, arrhythmias, hypertension, diabetes.
Side-Effects: fine tremor, nervous tension, headache, arrhythmias, palpitations, tachycardia, sleep problems in children, behavioural changes in children.
* Puffs may be repeated until clinical effect (see chapter on astma)

SODIUM VALPROATE

for epilepsy		**Start dose**	**Max dose**
CHILD	PO	5 mg/kg BID or TID	1g
ADULT	PO	200 mg TID	3g daily

- If possible, monitor liver functions.
- Do not stop suddenly: decrease slowly.

Be careful in: Children < 3 years.
Do not give: liver active disease.
Side-Effects: gastric irritation, nausea, ataxia, tremor, weight gain, low platelets, oedema, liver toxicity, especially in < 3 years, sedation, confusion.
SV effect increased by: aspirin.
SV effect decreased by: chloroquine, mefloquine.

SPIRONOLACTONE

CHILD	PO	nephrotic syndrome	3 mg/kg OD with Furosemide
ADULT	PO	nephrotic syndrome	3 mg/kg OD with Furosemide
	PO	ascites	100-200 mg OD up to 400 mg
	PO	heart failure	25 mg OD with Furosemide/ Enalapril

- See Nephrotic Syndrome, Heart failure chapters (**13.4 & 8.2**).

Do not give: pregnancy and breastfeeding, high Potassium.
Be careful: old people, liver and renal disease.
Side-Effects: nausea, impotence, gynaecomastia, menstrual irregularities, lethargy, headache, high potassium.
Risk of high potassium increased with indomethacin.
Diuretic effect decreased by: aspirin and contraceptive Pill.
Diuretic effect increased by: digoxin.

STREPTOMYCIN

Use only for TB treatment together with other drugs (never alone), See **TB Chapter**, **21.5**

CHILD			IM	15 mg/kg OD	**Interaction:** if possible do not give together with Furosemide (see gentamicin). **Be careful**: children and elderly, kidney disease, deaf, sight poor. **Side-Effects**: ear toxicity (also of the foetus), kidney toxicity (also of the foetus), skin rash.
ADULT	< 45 years	> 50 kg	IM	1 g OD	
		< 50 kg	IM	750 mg OD	
	45-60 years	> 37 kg	IM	750 mg OD	
		< 37 kg	IM	500 mg OD	
	> 60 years		IM	500 mg OD	

TETRACYCLINE

CHILD < 8 years	**not recommended**		• T can become toxic if not stored properly: if doxycycline available, prefer doxycycline. **Side-Effects**: allergic reactions, headache. **Do not give**: pregnancy, children < 8 years. **T. absorption reduced by**: aluminium and iron.
CHILD > 8 years and ADULT	PO	250-500 mg QID	

TRAMADOL

CHILD	PO	**not recommended**		**Side-Effects**: dizziness, headache, constipation and drowsiness, hypotension. Overall less nervous system or cardiovascular side effects than pentazocine and less addiction.
ADULT	PO	50-100 mg every 4-6 hours	Max 400 mg/day	

THYROXINE

ADULT	PO	**Start dose**	100 microgram OD, Raise monthly with 25 microgram until symptom free (usually 100-200 microgram OD)	**Side-Effects**: if dosing too high symptoms of hyperthyroidism. **Interaction**: do not give with ferrous sulphate.

VITAMIN A

Treatment dose:		Day 1	Day 2	Day 8
CHILD < 6 months	PO	50,000 IU stat	50,000 IU stat	50,000 IU stat
CHILD 6 months-1 year or < 8 kg	PO	100,000 IU stat	100,000 IU stat	100,000 IU stat
CHILD > 1 year or > 8 kg	PO	200,000 IU stat	200,000 IU stat	200,000 IU stat
WOMEN Reproductive age	PO	10,000 IU OD x 2 weeks or 25,000 IU once/week x 8 weeks		

Prevention dose:

NEWBORN	PO	50,000 IU at birth	• Before giving prevention dose, check if one has been given in the last 4 months. • To give a dose smaller than 200,000 IU using a 200,000 IU capsule, see **Vitamin A chapter, (17.2).** • **Note: do NOT give in** pregnancy.
CHILD 6 months -1 year or < 8 kg	PO	100,000 IU every 4-6 months	
CHILD > 1 year or > 8 kg	PO	200,000 IU every 4-6 months	
MOTHER	PO	200,000 IU at delivery and 200,000 IU the next day.	

VITAMIN B1 (THIAMINE)

Treatment:

INFANTS	IM 50 mg TID x 1 day then 10 mg PO x 6 weeks **Note:** Treat the Mother: see Adult – mild deficiency	• See Vitamin B1 deficiency chapter (**17.2**). • See heart failure (**8.2**). • Tablets not to be taken when chewing betel-nut: this inactivates Vitamin B1.
ADULT – mild deficiency*	PO100 mg OD x 7 days then PO10 mg OD x 6 weeks	
ADULT –severe deficiency*	IM 100 mg TID x 1 day then PO100 mg OD x 7 days then PO10 mg OD x 6 weeks	

Prevention in pregnant women and their babies:

PREGNANT WOMEN	PO	100 mg OD during pregnancy and breastfeeding (up to 6 months)

VITAMIN B6 (PYRIDOXINE)

Prophylaxis of neuropathy when taking Isoniazid

ADULT and CHILD	PO	10 mg OD	• Higher dose reduces action of isoniazid.

VITAMIN B12

Vitamin B12 deficiency

ADULT	IM	1 mg 3 x / week for 2 weeks

24.10 DRUGS DURING PREGNANCY

- Always ask a woman if she is pregnant before treating her.
- Prescribe medicine carefully during pregnancy.
- Some drugs can be given safely (Table A).
- Some drugs are not recommended in pregnancy but the benefits outweigh the risks, so they can be given after discussion with the doctor.
- Some are contra-indicated only during one part of the pregnancy. (Table B).
- Some drugs should not be given at all in pregnancy (Table C).

TABLE - A

Drugs safe to use in pregnancy:

ALUMINIUM	METOCLOPRAMIDE
HYDROXIDEAMPICILLIN/AMOXICILLIN	MULTIVITAMINS
CEFTRIAXONE/CEPHALOSPORINS	NICLOSAMIDE
CHLOROQUINE	NYSTATIN
CLOXACILLIN	ORS
DEXAMETHASONE	PARACETAMOL
ERYTHROMYCIN	PENICILLINS
FERROUS SULFATE	QUININE
FOLIC ACID	SALBUTAMOL
HYDRALAZINE	VITAMIN B1, B12 and C
METHYLDOPA	

TABLE - B

Drugs that must be prescribed with care; if necessary discuss with the doctor:

ADRENALINE	FUROSEMIDE
ALBENDAZOLE	GENTAMICIN
AMINOPHYLLINE	HYOSCINE
ARTESUNATE	INDOMETHACIN
ASA	MEBENDAZOLE
CIPROFLOXACIN	METRONIDAZOLE
CHLORPHENIRAMINE	PHENOBARBITAL
COTRIMOXAZOLE	PRAZIQUANTEL
DIAZEPAM	PREDNISOLONE

TABLE - C

Drugs Contra-Indicated:

CHLORAMPHENICOL	MEFLOQUINE
CIMETIDINE	PRIMAQUINE
ERGOMETRINE	TETRACYCLINES (including DOXYCYCLINE)
HYDROCHLOROTHIAZIDE	VITAMIN A
GRISEOFULVIN	STREPTOMYCIN

24.11 NEWBORN & INFANT GUIDELINES

These guidelines provide a framework for the management of unwell infants. Remember children and infants can deteriorate rapidly, especially newborn infants. Ensure that you plan ahead and consider whether referral is necessary.

Contents

These Newborn and Infant Guidelines of SMRU are written by Claudia Turner, research paediatrician.

Preterm and Low Birth Weight Infants

DEFINITIONS

Preterm Infants

Any infant less than 37 weeks gestation

Low birth weight infants

Birth weight less than 2.5 kg.

These infants must not be discharged home until seen by or discussed with a doctor. If the infant is born at home they must be reviewed as soon as possible.

BOTH GROUPS ARE AT RISK FROM

- Sepsis – **see Protocol for the Management of the Septic Infant**
- Hypothermia
- Feeding Difficulties
- Low blood sugar.

ROUTINE CARE FOR ALL INFANTS

- Newborn examination by trained personnel
- Observations 6 hourly

  - Temperature
  - Respiratory rate
  - Pulse rate
  - Blood sugar if infant has not fed for longer than 8 hours
- Every infant should be examined every day by the medic (baby clothes must be un-wrapped for full examination) and by a doctor on admission and once a week after that
- Infants less than 34 weeks should have a cranial USS performed prior to discharge.

Protocol for Antibiotic Prophylaxis for the Newborn Infant

Risk factors for sepsis in newborns

- Pre term (less than 37 weeks gestation)
- Water bag leaking for more than 18 hours and no antibiotics given to the mother, or antibiotics given less than four hours before delivery
- Temperature of Mother (if not due to malaria)
- Infection in Mother (if not due to malaria) even if started treatment
- Mother has had previous infant deaths in the first week
- Poor feeding or not tolerating feeds

If the infant has two of the above risk factors, or a fever, the infant needs antibiotics

Fever = temperature ≥ 38°C on one occasion or ≥37.5 °C on two occasions more than 4 hours apart

Take a blood culture and CBC and start ampicillin and gentamicin IV

Antibiotics should continue until the blood culture result is known and should only be stopped or changed to oral by a doctor

Protocol for the Management of the Septic Infant up to 8 Weeks

Danger Signs in Infants

- Unable to breast feed
- Fever = temperature ≥ 38°C on one occasion or ≥37.5 °C on two occasions more than 4 hours apart
- Hypothermia (Temp less than 36 °C)
- Convulsions
- Drowsy or unconscious
- Respiratory rate less than 20/min or apnoea (cessation of breathing for more than15s)
- Respiratory rate greater than 60/min
- Grunting
- Severe chest indrawing
- Central cyanosis
- Offensive / smelly wet umbilical cord

Antibiotic Treatment

- Use the flow chart to decide which antibiotics to use
- The length of treatment must be discussed with a doctor and will depend on the infant's condition and any positive results

Failure to improve

If the temperature fails to settle in 48 , or the child's condition worsens, discuss with the doctor and consider changing to cefotaxime

Management of the unwell infant < 2 months

Infant should be seen by a doctor, or discussed with a doctor, at least once a day

Does the child have any of the danger signs?
Or
A fever (= temperature ≥ 38° C on one occasion or ≥ 37.5 ° C on two occasions more than 4 hours apart)
Or
Are you very concerned about this infant?

NO → **Remember**, specific signs of sepsis may be absent in young infants → Take a full history and exa mine the infant, treat as appropriate

YES ↓

Has the infant been assessed and treated following the "Emergency Protocol for the Seriously Ill Child"?

NO → Assess and treat infant following the 'Emergency Protocol for the seriously Ill Child'

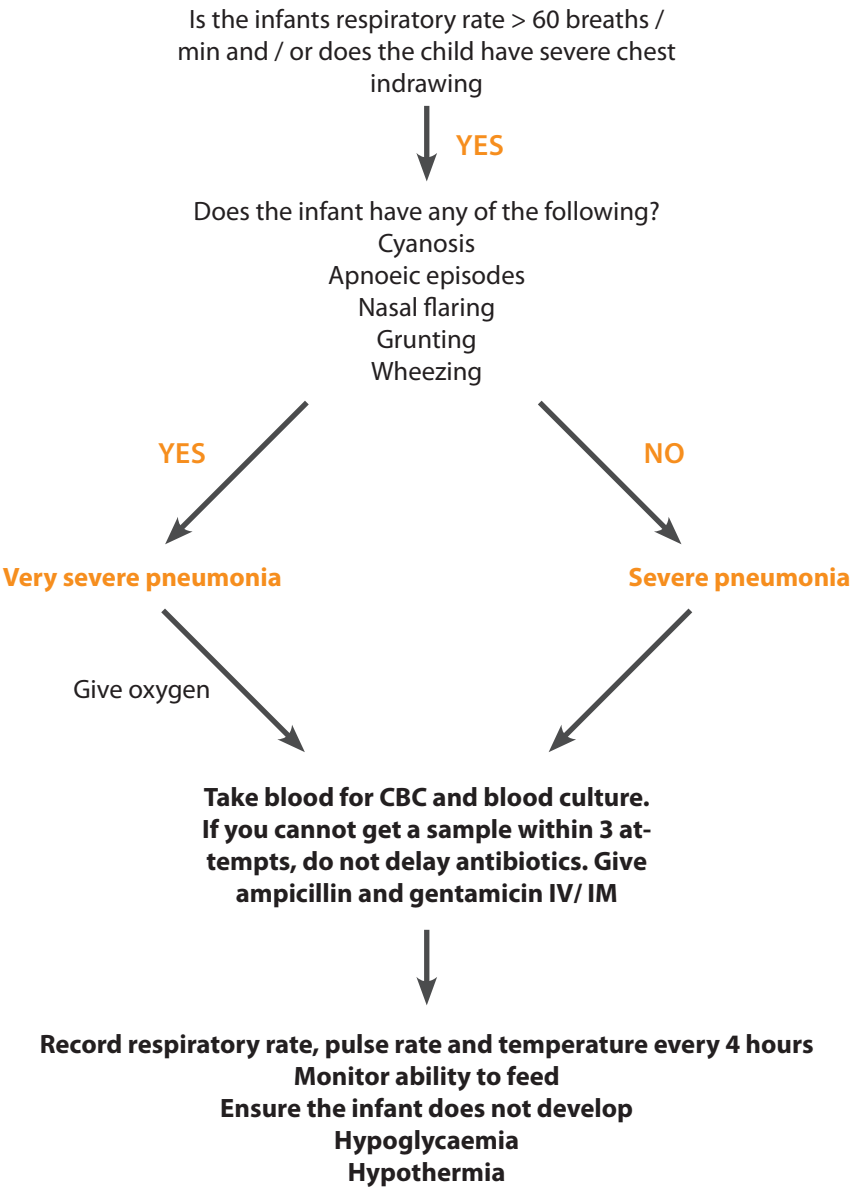
YES ↓

Exclude malaria

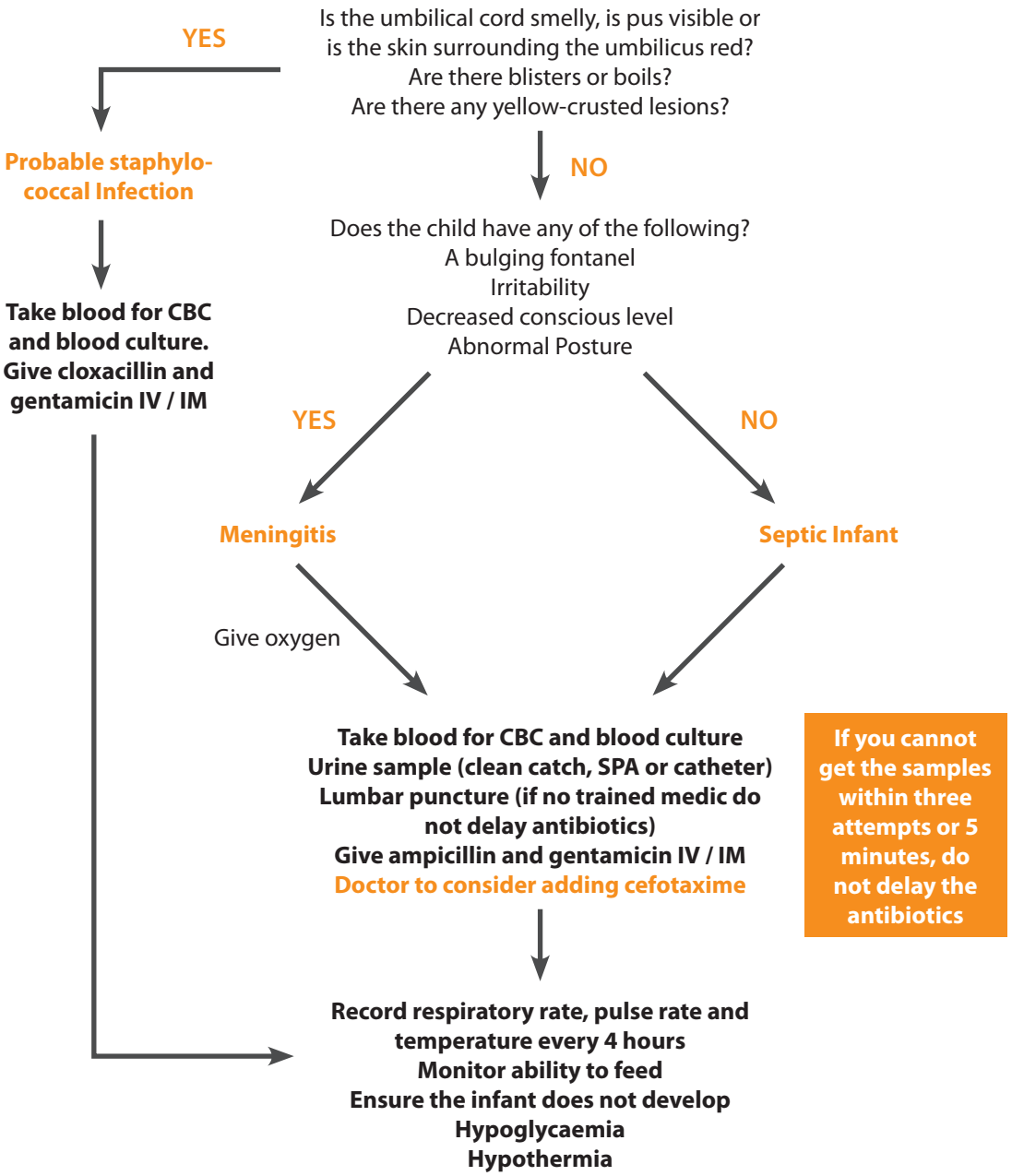
Assess Infant's predominant symptom and refer to appropriate protocol

Respiratory Distress	**Pneumonia Protocol: Infant < 2 Months**
Umbilical sepsis	**Septic Infant < 2 Months Protocol**
Irritability, bulging fontanel	**Septic Infant < 2 Months protocol**
Diarrhoea	**Gastroenteritis protocol**
Skin pustules / blisters	**Septic infant < 2 Months protocol**
None of the above	**Septic infant < 2 Months protocol**

Pneumonia Protocol: Infant < 2 months



Septic Infant < 2 Months protocol



Diarrhoea Treatment Protocol

Assess child for signs of dehydration

Severe dehydration
2 or more of the following signs:
Lethargy / unconsciousness
Sunken eyes
Unable to drink, or drinks poorly
Skin pinch goes back very slowly (> 2s)

Mild Dehydration
2 or more of the following signs:
Restlessness, irritability
Sunken eyes
Drinks eagerly, appears thirsty
Skin pinch goes back slowly

No Dehydration

SEE NEXT PAGE

IV rehydration with Ringers's solution

	First give 30ml/ kg in	Then give 70ml/kg in
< 12 months	1 hour	5 hours
> 12 months	30 minutes	2 ½ hours

All children with diarrhoea should be given zinc
Up to 6 months 10 mg OD for 14 days
More than 6 months 20 mg OD for 14 days

Measure urine output, use plastic zip bag for boys and cotton wool for girls.
Should be greater than 1 ml / kg / hour

Reassess the child every 15 minutes until a strong radial pulse is present
If hydration is not improving, give the IV solution more rapidly

When the full amount has been given, reassess

Call for help

If signs of severe dehydration are still present: repeat the IV fluid infusion

The child is improving but still showing some signs of dehydration → Move to mild Dehydration protocol

Mild Dehydration

2 or more of the following signs:
Restlessness, irritability
Sunken eyes
Drinks eagerly, appears thirsty
Skin pinch goes back slowly

No Dehydration

Tell the mother to breast-feed frequently and for longer each time
If not breast-feeding give ORS, food-based fluids or clean water
Teach the mother how to mix ORS, give the mother two packets to use at home.
In addition to the usual fluid intake, tell the mother to give:
< 2 years 50 - 100 ml after each loose stool
> 2 years 100 - 200 ml after each loose stool

Make up the ORS according to the packet's instructions.
Determine the amount of ORS to give over 4 hours

Age	< 2 months	2-4 months	4 months - 12 months	12 months - 2 years	2 years - 5 years
ORS (ml)	100-200	200-400	400-700	700-900	900-1400

When discharged

Calculate maintenance amount ORS
= 150 ml / kg / day
Divide by 24 to get hourly amount
If drinking well, offer ORS by mouth
If not drinking well, place NTG and give 1 hourly amount ORS

After 4 hours reassess the child

No improvement
Call for help
(can repeat ORS)

Sighs of dehydration improved

IF NGT FLUIDS ARE NOT TOLERATED GIVE IV FLUIDS AS FOR SEVERE DEHYDRATION

Young children with fever and systemic upset and bloody diarrhoea give ciprofloxacin 7.5 mg BID for 5 days and metronidazole 7.5 mg/ kg (max 400 mg) TID 10 days.

Antibiotic Doses

Gentamicin IV/IM	
Infants less than 2 months	4mg/kg OD
Ampicillin IV/IM	
First week of life	50mg/kg BID
1 – 3 weeks	50mg/kg TID
Older than 3 weeks	50mg/kg QID
Amoxicillin	
0 -1year	
Mild infections	62.5mg = 2.5cc TID
Severe Infections	125mg = 5ccTID
Cloxacillin IV/IM	
First week of life	50mg/kg BID
Weeks 2-4	50mg/kg TID
Weeks 4 onwards	50mg/kg QID
Cloxacillin PO	
0 -1year	
Mild infections	62.5mg = 2.5cc QID
Severe Infections	125mg = 5ccQID
Cefotaxime IV/IM	
All ages	50mg/kg QID

IV Maintenance Fluids

- Must be prescribed by a doctor (can be done verbally)
- Use IV 10% dextrose for the first 48 hours change then to 0.18 % saline and 8% dextrose
- Use the volumes per day as for oral feeds
- 60 drops equals 1ml so 1 drop per minute will equal 1ml/hr

For infants 0-2 days use	**10% Dextrose**
For infants 2 days – 4 weeks use	**8% Dextrose and 0.18% Saline***
	*To make 8% Dextrose, 0.18% Saline Remove 100ml from 500ml bottle 10% dextrose Add 100ml of normal saline
From 4 weeks use	**5%Dextrose and 0.81% Saline****
	**To make 5% Dextrose, 0.81% saline Remove 50ml from 500ml bag normal saline Add 50ml 50% dextrose

Hypothermia

DEFINITION

- Temperature <36.5°c
- Hypothermia puts the infant at risk from
  - Low blood sugar
  - Poor weight gain
  - Respiratory difficulties

TREATMENT OF HYPOTHERMIA

Step 1

- Temperature 36°c – 36.5°c
  - Ensure the baby is not wet – may need clean baby cloth
  - Wrap the baby in extra blankets
  - Place warm water bottles next to the baby
  - Place the baby on a warm soft water bottle
  - Recheck the temperature in 1 hour
  - If not increased, move to step 2

Step 2

- Temperature 35.5°c – 36°c
  - Kangaroo care with Mother or Father
  - Recheck temperature in 30 minutes
  - If not increased, move to step 3
  - If temperature >36°c over next 4 hours, move to step 1

Step 3

- Temperature < 35.5°c
  - Warm under radiant heater
  - Recheck temperature in 30 minutes
  - When temperature > 35.5°c, Kangaroo care with Mother or Father
  - Check blood sugar

Kangaroo Care

- Fold a square piece of cloth diagonally
- Put cloth nappy on baby
- Place the baby on to the Mother or Father's naked chest
- Place the cloth around the baby. Either tie a knot around the parent's back or secure
- under the arms
- Parent to dress with clothing around the baby

Feeding

Day 1

- 60ml/kg

Day 2

- 80ml/kg

Day 3
- 100ml/kg

Day 4
- 120ml/kg

Day 5
- 140ml/kg

In term babies stop at 150ml/kg/day
In preterm and low birth weight infants increase as below

Day 6
- 160ml/kg

Day 7
- 180ml/kg

Day 8 onwards
- 200ml/kg/day

Naso Gastric Tube (NGT) Feeding

Day 1
- 1 hourly feeds

Day 2
- If 1 hourly feeds tolerated increase to 2 hourly feeds
- If infant does not tolerate 2 hourly go back to 1 hourly

Day 3
- If 2 hourly feeds tolerated increase to 3 hourly feeds
- If 3 hourly not tolerated move back to 2 hourly feeds

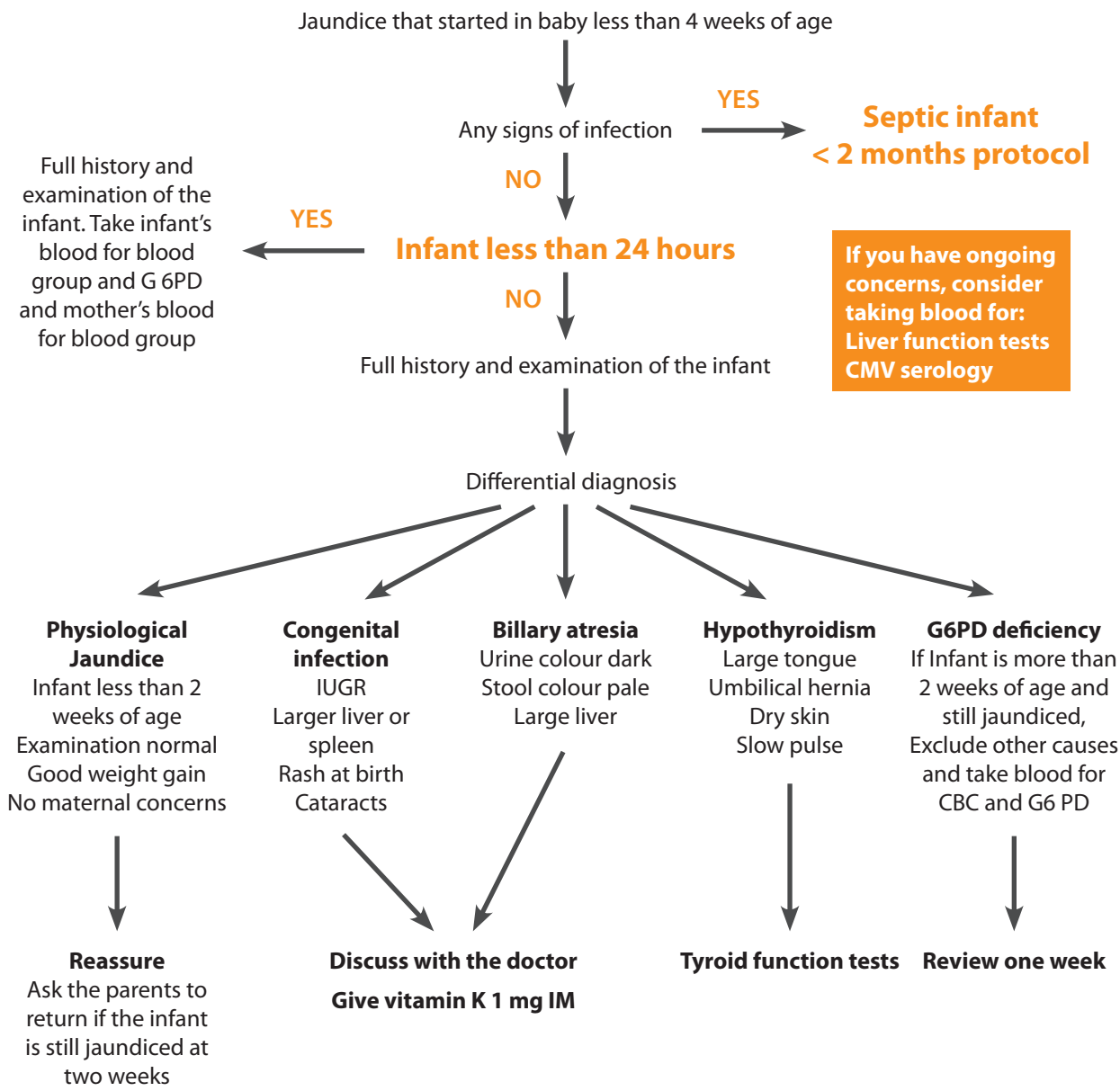
Day 4
- If 3 hourly feeds tolerated increase to 4 hourly feeds
- If 4 hourly not tolerated move back to 3 hourly feeds

NOT TOLERATED = VOMITS 2 FEEDS IN A ROW

Hypoglycaemia
- If drowsy, unconscious or convulsing, check blood glucose
  - If glucose <2.5 mmol/l give glucose IV 1ml/kg 50% Dextrose
- If asymptomatic and glucose <2.5 mmol/l give 2.5ml 50% dextrose mixed with 2.5ml water by NGT and then feed the infant with breast milk

RECHECK BLOOD SUGAR AFTER 1 HOUR

Neonatal Jaundice



ANY BABY WHO IS JAUNDICED SHOULD HAVE SUN EXPOSURE FOR AT LEAST 4 HOURS A DAY.

Congenital Malaria

DEFINITIONS

- Positive malaria slide in the 1st 7 days of life when mother was positive for malaria

Make a malaria smear of every infant born to a mother who has had malaria in the last 7 days before delivery. Repeat at day 7 or at any time in the first month if the baby is unwell.

INFANTS ARE AT RISK OF

- Death
- Mistakenly treated as Neonatal Sepsis
  - see **Protocol for the Management of the Septic Infant**

TREATMENT

P. falciparum

Use a loading dose parenteral treatment to start with, as the clinical condition can decrease rapidly

Artesunate 2.4.mg/kg IM then oral artesunate 2 mg/kg/day for 7 days

P. vivax

Day 0	and Day 1	Chloroquine 10 mg base/kg once a day
Day 2		Chloroquine 5 mg base/kg

Do not give primaquine to newborns

Continue routine care for the infant (**2**)

Malaria – infants less than 2 months

DEFINITION

- Positive malaria slide in an infant less than 2 months

The risk of vomiting in small children is high. The nurse must give the medication in a supervised way.

INFANTS ARE AT RISK OF

- Death
- Mistakenly treated as Neonatal Sepsis
  - see **Protocol for the Management of the Septic Infant**
- Severe anaemia

TREATMENT

Use a loading dose parenteral treatment to start with, as the clinical condition can decrease rapidly

Artesunate 2.4.mg/kg IM then oral artesunate 2 mg/kg/day for 7 days

Vitamins and Supplements

MULTIVITAMINS, FOLIC ACID AND FERROUS

All preterm infants should receive multi vitamins and folic acid, from when they are fully breast-fed until they are term.

After four weeks of age the infants should receive multivitamins with iron.

DOSE OF FOLIC ACID

2.5mg (half a tablet) once a week

VITAMIN K

Vitamin K helps the blood to clot. Some newborn babies are at risk of vitamin K deficiency; these infants can have severe bleeding.

INFANTS AT RISK

Preterm infants
Low birth weight infants (<2.5kg)
Baby born to epileptic mother
Baby born to mother on TB medication

These babies should receive 1mg Vitamin K IM
Give 0.1ml phytomenadion phosphate

Neonatal Tetanus

DEFINITION

Tetanus is a disease caused by a toxin produced following an infection with Clostridium tetani. It is common in newborns following infection of the umbilical stump.

Tetanus immunisation of the mother (at least two doses) protects the baby from this disease.

CLINICAL FEATURES

Signs usually start at the end of the first week of life and include:

- Stiffness of the neck muscles
- Difficulty in swallowing
- Muscular spasms, the infant may be alert and in great pain throughout the spasm

INFANTS ARE AT RISK OF

- Death
- Aspiration pneumonia
- Respiratory failure
- Permanent neurological problems

TREATMENT

- Benzylpenicillin IV 50mg/kg stat (then QID for one week)
- Remove as much of the umbilical cord as possible, clean the rest
- Refer to hospital as soon as possible as the infant will require tetanus
- mmunoglobulin, sedation, intubation and ventilation

25 INDEX

Names of medication are written in *italic*.

25 INDEX

Note:
Where possible only the most important index page number is mentioned. (**e.g. fever p24**). Then In that chapter, under the section references other page numbers are mentioned.

CARDIAC ARREST:
CARDIO PULMONARY RESUSCITATION

Call for help

↓

Airway opening manoeuvres

↓

Look, Listen, Feel

↓

Check signs of breathing and circulation

↓ NONE

Start CPR (ration of 15:2)

↓

Insert IV line

↓

Adrenaline IV

↓

Continue CPR

Repeat Adrenaline every three minutes

IF NO SIGNS OF LIFE AFTER 20 MINUTES: STOP

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