REVOLUTIONARY GOVERNMENT OF ZANZIBAR
MINISTRY OF HEALTH AND SOCIAL WELFARE

STANDARD TREATMENT GUIDELINES

ZANZIBAR
THIRD EDITION

2009

Ministry Of Health And Social Welfare in collaboration with:

World Health Organization

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Foreword

The Standard Treatment Guidelines was first printed in 1993 and revised in 2005. This is the third Edition of its kind covering almost every common disease in Zanzibar.

This edition has been produced as a result of realization that the field of therapeutics is a dynamic and requires a constant monitoring of developments in the practice of medicine.

Zanzibar Standard Treatment Guidelines is meant to serve as a Hand book of reference for Prescribers, Pharmaceutical staff and other Medical and Paramedical personnel. Nevertheless, clinical judgment and experience will always prevail for adjustment of treatment in individual cases when necessary. It should not be forgotten that patients must take full responsibility for their own health, including adherence to prescribed treatment and lifestyle changes.

This version was completed after consultation with different stakeholders. My sincere thanks to all those who freely devoted their time to comment on the numerous drafts.

I hope this edition of the Standard Treatment Guidelines will guide you daily in treating all patients optimally.

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Minister of Health and Social Welfare.
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Rational Prescribing and Dispensing of Medicines

Rational prescribing requires that the prescriber makes an accurate diagnosis of a condition, selects a suitable medicine from those available, and prescribes the medicine in the right dose for a sufficient length of time according to the standard treatment.

Medicines should be prescribed only when they are necessary for treatment following a clear diagnosis. Not all patients or conditions need a prescription for medicines. In certain conditions simple advice and non-medicine treatment may be more suitable.

In all cases the prescriber should consider the expected benefit of a prescribed medication against potential risks. This is important during pregnancy where the risk to both mother and foetus must be considered.

All prescriptions should:
• be written legibly in ink by the prescriber with the full name and address of the patient, and signed with the date on the prescription form
• have contact details of the prescriber e.g. name, code number and address

In all prescription writing the following should be noted:
• The name of the medicine or preparation should be written clearly in full using the generic name and
• Avoid unnecessary use of decimal points and only use where decimal points are unavoidable. A zero should be written in front of the decimal point where there is no other figure, e.g. 2 mg not 2.0 mg or 0.5 ml and not .5 ml
• Frequency. Avoid Greek and Roman frequency abbreviations which cause considerable confusion – qid, qod, tds, tid, etc. Instead either states the frequency in terms of hours (e.g. 8 hourly)
• State the treatment regimen in full:
  _ Drug name and strength
  _ Dose or dosage
  _ Dose frequency
  _ Duration of treatment
  e.g. Cap. Amoxicillin 250mg, 8 hourly for 5 days
• In the case of “as required” a minimum dose interval should be specified, e.g. every 4 hours as required
• Most outpatient prescriptions for chronic medication are for a month (28 days) or more; check that the patient will be able to access a repeat dose before the 28 days are up.
• After writing a prescription, check that you have stated the dose, dose units, route, frequency, and duration for each item. Consider whether the number of items is too great to be practical for the patient, and check that there are no redundant items or potentially important medicine interactions. Check that the prescription is dated and that the patient’s name and file number are on the prescription card. Only then sign the prescription, and as well as signing provide some other way for the Dispenser to identify you if there are problems.

Rational Dispensing

Dispensing is a process of supplying medicine(s) to a patient. The process requires adequate knowledge, skill and caring attitude. In addition to that, careful dispensing is very useful component in the recognition of medicine supplies because it is the last step which, ensures that the patient has received the right medicine.

In Zanzibar, due to shortage of pharmaceutical staff, health workers of almost all categories are involved in dispensing medicines. The principle of good dispensing practice is vital for all these categories of workers. However, medicines are potential poisons. It is dangerous to dispense to a patient a wrong medicine or in wrong quantity. Insufficient quantities may not cure the patient or make the medicine ineffective. More than enough may be harmful or cause loss of resources, which include money. Proper dispensing ensures that medicines are given and taken correctly in order to achieve expected results from their use.

Steps necessary for rational dispensing are:

(a) Patient approach

• Greet patients. This helps you to know the language the patients speaks and to relax the patient.
• Receive the prescription and read it carefully and understand it
• Ask patient if the name on the prescription is correct

(b) Analysis of a prescription and other issues of concern

Make sure that important information on the prescription such as name of medicines, strength, dose, dosage, duration of treatment is legibly correct and properly written for the right patient
• Make sure that the prescription is legally valid
• Check prescribers’ signature or code number of prescriber if applicable.
• Don’t accept prescription from other Facilities without following the laid down procedures of your Facility
• Check with the prescriber if there are abnormalities found in the prescriptions
• Never hesitate to seek advice or help from other health workers in case of doubts
• Never guess but make sure you understand all instructions well. Prescribers have to be prepared to give you explanations where and when you are uncertain

(c) **Check if right medicines are dispensed**

• Take original containers of prescribed medicines from the shelf
• Read the labels carefully to be sure that you have picked the right medicines
• Before returning the container to the shelf, read again the label carefully

(d) **Calculate quantities**

• Calculate the required quantity of medicines on the prescription. The quantity to be dispensed is based on the daily dose and duration of treatment (in days, weeks or months)

(e) **Dispense right quantity**

• Count or measure required quantity of medicines and put into the right containers or packages

(f) **Duration of treatment**

• Duration of treatment is usually written in the following format
  - 3/7 for (3 days out of 7 days in a week)
  - 6/52 for (6 weeks out of 52 weeks in a year)
  - 2/12 for (2 months out of 12 months in a year)
(g) **Recording of Medicines Dispensed**

Record quantity of medicines and medical supplies dispensed in the dispenser’s register.

(h) **Adequate packaging and labelling**

- Select a suitable container or package for each prescribed medicine. The selected container should be proportional to the contents and be able to maintain quality and stability of the medicine i.e. special attention should be observed when packing sugar coated tablets or light sensitive preparations

- Always dispense medicines in appropriate containers and label appropriately

(i) **Appropriate information**

- Make sure that the patient understands the information you are giving on how to use the medicines, the duration, expected side effects and what to do if they are severe, drug interactions and appropriate warnings.

- For instructions to use, ask the patient to repeat what you have said to make sure they have understood.
CHAPTER 1

1.0 GASTRO INTESTINAL DISEASE CONDITIONS

1.1 Ulcers and related conditions

*Description/Clinical features:*
The term peptic ulceration usually refers to an ulcer in the lower esophagus, stomach and duodenum. The common ulcers are duodenal and/or gastric. Peptic ulcer may present in many different ways. The commonest is chronic, episodic pain present in many different ways, and may persist for months or years. However, the ulcer may come to attention as an acute episode with bleeding or perforation, with little or no previous history. As with duodenal ulcer, epigastric pain is the commonest symptom of gastric ulcer.

*Peptic ulcer general measures*
Careful history and examination are essential. Lack of rapid symptomatic response to anti acids makes peptic ulceration an unlikely diagnosis. Symptoms of many unrelated conditions mimic those of peptic ulcer. Protracted treatment without investigation to establish the diagnosis is wasteful and potentially harmful.

*Non Drug treatment:*
- Advice patients to avoid ulcerogenic medications e.g. NSAIDs
- Advice patient to stop smoking and drinking alcohol
- Dietary advice by dietician

*Drug Treatment:*

1.1.1 (a) Helico Pylori positive:
The vast majority of Gastric Ulcers and Duodenal Ulcers are associated with Helico pylori infection and eradication therapy is indicated if infection is present. This will greatly reduce the rate of recurrent ulceration in the future.

Empiric eradication of H. pylori is not recommended.
Proton pump inhibitor (PPI)

• Omeprazole, Oral, 40mg / day
  Duodenal ulcer: for 7 days
  Gastric ulcer: for 28 days

And

H. pylori eradication

Amoxicillin 1g, oral, 12hourly

Or

For penicillin allergy:
Clarithromycin 500mg, oral, 12 hourly

Plus

Metronidazole 400mg, oral, 12 hourly for 7 days

Or

If above regimen is not working, use:
Lansoprazole 30mg, once daily + Clarithromycin 250mg, 12 hourly + Tinidazole
500mg once daily for 5 days
Then Lansoprazole 30mg, once a day for one month

Failure for Helico pylori eradication (best dealt within a specialist setting):
  • Clarithromycin 500mg, oral, 12 hourly
  Plus
  • Amoxicillin 1g, oral, 12hourly for 7 days

Drug Treatment:

1.1.1 (b) Helico Pylori negative:
These are usually a consequence of NSAIDs use.
Stop NSAIDs until ulcer has healed.
If patient in unable to stop NSAIDs, refer to a specialist.

Proton pump inhibitor (PPI)

• Omeprazole 20mg, oral, once a day
  Duodenal ulcer: for 7-14 days
  Gastric ulcer: for 28 days

Resistant diseases
Ulcer not healing.
High-risk patients, i.e. poor surgical risk and elderly or concomitant disease. Maintenance therapy with proton pump inhibitors, Omeprazole, oral, 20mg/day. Specialist initiated
Advice:
Encourage relaxation and regular exercise
• “Ulcer diets” are unnecessary. Reduce spices, and avoid foods that exacerbate pain in individual patients.

Referral Criteria:
Patients with persistent or recurrent ulcers should be referred to a specialist for further evaluation and treatment.

1.1.2 Non-ulcer Dyspepsia
Description/clinical features:
Symptoms are identical to duodenal ulceration without night exacerbation with normal endoscopy or barium meal tests.
Explanation and reassurance are important
General measures for peptic ulcers (above) including antacids ie magnesium trisillicate (see dose bellow).
Try milk-free diet for possible lactose intolerance

1.1.3 Gastritis
Description/clinical features:
Inflammation of the gastric mucosa. The common symptoms are epigastric pain, nausea, vomiting and heart burn.

Drug treatment:
Anti acid: Magnesium trisillicate 500mg, oral, chewed as required.
Best taken 1 – 3 hours after meal and at bedtime.
Plus
Cimetidine 400mg, oral, 12 hourly for 8 weeks
Or
Omeprazole 20 mg, oral, daily for 4 weeks

Treat underlying cause – anxiety, burn, alcohol/cigarette addiction, drug abuse.

Advice:
• Reduce spicy food, stop smoking, and stop drinking alcohol.
• Avoid non-steroidal anti-inflammatory drugs like Acetyl Salicylic Acid or other predisposing drugs.
• Encourage relaxation and regular exercise
**Prevention:**
- Avoid spicy food, carbonated drinks, cigarette smoking and alcohol.
- Avoid the excessive use of medicines especially non-steroidal anti-inflammatory drugs like Acetylsalicylic acid.

**Complications:** Peptic ulcers.

**Referral Criteria:**
- Refer chronic cases for appropriate management.
- Refer if pain becomes severe.

### 1.2 Parasitic Diseases

#### 1.2.1 Amoebiasis

**Description/Clinical features:**
Amoebiasis is caused by a protozoan parasite *Entamoeba histolytica*. It is usually transmitted from person to person through faecal contamination of food or hands, but may also be transmitted via anal sexual contact. Amoebic dysentery occurs when the parasites invade the intestinal wall and abscesses may develop in the liver or, less frequently, in the lung or brain as a result of haematogenous spread. Skin lesions may also occur. Pregnant women and individuals who are malnourished or immunocompromised are most vulnerable to systemic infection.

#### 1.2.1.1 Intestinal amoebiasis

**Non drug Treatment:**
Rehydration may be necessary. This should be done with ORS unless the patient is vomiting or profoundly dehydrated.

**Drug treatment:**

**First choice:**

- **Adults:** Metronidazole 750-800mg, oral, 8 hourly with food for 5 days
- **Children:**
  - 1-3 years: 200-250mg 8 hourly for 5 days
  - 3-7 years: 200-250mg 6 hourly for 5 days
  - 7-10 years: 400-500mg 8 hourly for 5 days

**Note:** Above 10 years as for adult
**Second choice:**

**Adults:** Tinidazole 2g, oral, once daily for 3 consecutive days.

**Children:** Tinidazole, oral, 20 mg/kg body weight, 8 hourly for 3 consecutive days

**Or**

**Adults:** Secnidazole 2g, oral, as a single dose.

**Prevention:**
- Thoroughly cook all raw foods.
- Thoroughly wash raw vegetables and fruits before eating
- Bathrooms and toilets must be cleaned often
- Boil untreated water coming directly from lakes or rivers before drinking

1.2.1.2 Amoebic liver abscesses

**Non drug treatment:**
Aspiration of the abscess may be necessary if it is easily accessible. Always consider the possibility of a pyogenic abscess.

**Drug of choice:**

**Adult:** Metronidazole 400-500mg, oral, 8 hourly for 10 days. Repeat course after 2 weeks if necessary

**Children:**
- 1-3 years: 100-200mg 8 hourly for 10 days
- 3-7 years: 100-200mg 6 hourly, for 10 days
- 7-10 year: 200-400mg 8 hourly, for 10 days

**Advice:**
- Metronidazole should be taken with food. The course may be repeated after two weeks if necessary
- Patients on Metronidazole, Secnidazole and Tinidazole should not take alcohol
- Metronidazole, Secnidazole and Tinidazole are contraindicated in the first trimester of pregnancy

1.2.2 Ascariasis

**Description/Clinical features:**
It is an infection caused by *Ascaris lumbricoides* (round worms). The main clinical features are abdominal discomfort or colic, rarely they may cause intestinal obstruction, obstructive jaundice and malnutrition.
**Drug treatment:**

**First choice:**

**Adult and Children above 2 years:** Mebendazole 100mg, oral, 12 hourly for 3 days or 500mg as a single dose.
Or
Albendazole 400mg, oral, as a single dose.

**Second choice:**

**Adult:** Levamisole 120-150 mg, oral, as a single dose.

**Children, 1 - 2 years:** Levamisole, oral, 3 mg/kg body weight as single dose.
Or
Levamisole, oral, 2.5 mg/kg body weight as single dose, repeated after 7 days.

**Prevention:**
- Use Latrine and maintain personal hygiene.
- Wash hands before meal and after using toilet.
- Wash fruits and vegetables before eating.

1.2.3 Ancylostomiasis (Hookworm disease).

**Description/ Clinical features:**

Ancylostomiasis (hookworm disease) is caused by infestation of the small intestine with *Ancylostoma duodenale* or *Necator americanus*. It is one of the main causes of anaemia in the tropics which is also the major clinical feature.

The majority of patients are asymptomatic. However, in hookworm disease the major clinical manifestations are iron deficiency anaemia and hypoalbuminaemia.

**Drug treatment:**

**Adult and Children above 2 years:** Mebendazole 100mg, oral, 12 hourly for 3 days or 500mg as a single dose
Or
Albendazole 400mg, oral, given as a single dose.

**Advice:**
- Albendazole and Mebendazole must be chewed. If ova persist, give second course after 3 – 4 weeks
Caution: Albendazole is contraindicated in the first trimester of pregnancy and children below 2 years.

Prevention:
- Use Latrine and maintain personal hygiene
- Wash hands before meal and after using toilet.
- Wash fruits and vegetables before eating.
- Wearing of shoes.

1.2.4 Giardiasis

Description/Clinical features:
It is an infection of the upper small intestine caused by the flagellate protozoan *Giardia lamblia* (or *G.intestinalis*). Infection with this flagellate is mainly asymptomatic. However when symptoms occur, it causes frothy fowl smelling diarrhoea, cramping abdominal pain, flatulence and sometimes vomiting. It may cause persistent diarrhoea and therefore weight loss. In few cases mal absorption syndrome may occur.

Suspect Giardia in all cases of diarrhoea lasting 14 days or more.

Non drug treatment:
Fluid and electrolyte replacement in severe diarrhoea

Drug treatment:
Treat after a positive laboratory stool test.

First choice:
- **Adult:** Metronidazole 2g, oral, once daily for 3 days
- **Or**
- 400-500mg, oral, 8 hourly for 5 days
- **Children:**
- 7.5mg/kg body weight 8 hourly for 7 days

Second choice:
- **Adult:** Tinidazole 2g, oral, as a single dose
- **Children:** 50-75mg/kg body weight as a single dose.

Or
- **Adult:** Secnidazol 2g, oral, as a single dose
Caution:
• Patients on metronidazole, Secnidazole and Tinidazole should not take alcohol
• Metronidazole, Secnidazole and Tinidazole are contraindicated in the first trimester of pregnancy

Prevention:
• Wash hands before meal and after using toilet.
• Wash fruits and vegetables before eating.

1.2.5 Strongyloidiasis
Description/Clinical features:
It is an intestinal infection caused by *Strongyloides stercoralis*. The intestinal infection is usually asymptomatic but patients may have vague symptoms such as abdominal pain, nausea, flatulence, vomiting, diarrhoea and even epigastric pain. Heavier infections are more likely to produce symptoms. In immuno compromised patients (e.g HIV/AIDS and prolonged use of steroids) disseminated infections may occur leading to enter colitis and gram negative bacteraemia.

Drug treatment:
Thiabendazole oral,
Adults: 25mg/kg body weight (maximum 1.5g) 12 hourly for 3 days.
Tablets must be chewed
Children: Same as for adults

Caution: Not to be given to pregnant women

Thiabendazole treatment in immuno-compromised patients is not always effective, hence repeated

Or
Prolonged courses of Thiabendazole from 5-14 days may be required.

Or
Ivermectin 200mg/kg, oral, once a day, for 2 days

Prevention:
• Use Toilets and proper excreta disposal.
• Wearing of shoes.
1.2.6 Typhoid and paratyphoid

**Description/clinical features:**
These acute systemic diseases result from infection by *Salmonella typhi* and *S. paratyphi*, A and B respectively. The clinical manifestation and duration of illness vary markedly from one patient to another. The major clinical features are fever, severe headache, drowsiness and muscle pains (myalgia).

The course of paratyphoid tend be to shorter and less severe compared to typhoid.

**Non drug treatment:**
Transfusion is indicated for severe haemorrhage.
Replace fluid and electrolytes.

**Drug treatment:**
*Treat after significant titre*

**First choice:**

- **Adults and children above 15 years:** Ciprofloxacin 500mg, oral, 12 hourly for 10 days
- **Or**
  - If oral therapy is not possible start with;
  - **Adult:** Ceftriaxone 2g, I.V, once daily
  - **Children:** Ceftriaxone, I.V, 50 -75 mg/kg once daily for 7 – 10 days

**Chronic carriers:**
- Ciprofloxacin, oral, 750 mg, 12 hourly for 6 weeks.

**Caution:** Ciprofloxacin is contraindicated in children below 15 years and pregnant women.

**Note:**
Stool cultures must be repeated at weekly intervals after convalescence to ensure that a carrier state has not developed. Two consecutive negative stool cultures are required to exclude carrier state. This is of vital importance in food handlers, who must not be permitted to return to work until stools are negative.
**Prevention:**
- Avoid undercooked food.
- Maintain food hygiene

1.3 Diarrhoea

**Description/clinical features:**
This is abnormal frequency of liquid faecal discharge. Usually, it is a self-limiting condition. Patients usually recover quickly with or without the aid of dietary measures or medication.
However it is important to know:
- Pattern of bowel frequency and motion consistency so as to assess severity.
- Very young children and very old patients are particularly susceptible to the effects of dehydration due to diarrhoea.

1.3.1 Clinical Types of Diarrhoeal diseases.

It is most practical to base treatment of diarrhoea on the clinical types of the illness, which can easily be determined when a patient is first examined. Laboratory studies are very useful with the exception of few conditions such as Cholera.

Four clinical types of diarrhoea can be recognized, each reflecting the basic underlying pathology and altered pathology:

**Acute Watery Diarrhoea (Including Cholera):** which lasts several hours or days, the main danger is dehydration and malnutrition if feeding is not continued.

**Bloody Diarrhoea:** which is also called Dysentery, the main dangers are damage of intestinal mucosa, sepsis, and malnutrition. Other complications including dehydration may also occur.

**Persistent Diarrhoea:** Last for 14 days or longer, the main danger is malnutrition and serious non-intestinal infections, dehydration may also occur.

**Diarrhoea with Severe Malnutrition (Marasmus or Kwashiorkor):** the main dangers are severe systemic infection, dehydration, heart failure, vitamin and mineral deficiency.

The basis for the management of each type is to prevent or treat dangers that each present.

1.3.2 Management of diarrhoea in children.

Over 90% of deaths from diarrhoea in under-fives would be prevented by:
- Continuing breast feeding and other feeding throughout the attack of diarrhoea (prevent malnutrition);
- Making sure mothers know when to take the child to a health
• Correct assessment, treatment and continued feeding at the health facility level (See MoH & SW chart and manual);
• Treatment of invasive diarrhoea (bloody stool) with antibiotics;
• Treating or prevent dehydration and electrolyte imbalance with ORS
• Reduce the duration and severity of diarrhoea and occurrence of future episodes by giving supplemental Zinc
• Referring to hospital for investigation and treatment for severe malnutrition and persistent diarrhoea (lasting>14 days)

Assessment of dehydration
Assessment and management are summarized on a chart, included here in a form of tables. Further information, copies of the Diarrhoea Management Chart and Diarrhoea Training Manual can be obtained from the IMCI Unit of Reproductive and Child Health Section, Ministry of Health and Social Welfare.

Other signs may be useful in assessing severe dehydration and influence also management:
• Weight loss over a short period;
• Signs of hypovolemic shock, fast weak pulses, cold extremities, oliguria or anuria;
• Hyperventilation, deep and fast breathing indicating acidosis.
• Signs of severe malnutrition

Assessment of Dehydration/Other problems

<table>
<thead>
<tr>
<th>Look</th>
<th>General condition</th>
<th>Eyes, Mouth and Tongue</th>
<th>Thirst</th>
<th>No dehydration</th>
<th>Some dehydration</th>
<th>Severe dehydration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well, alert</td>
<td>Normal</td>
<td>Normal</td>
<td>Drinks normal</td>
<td>Restless, irritable*</td>
<td>Lethargic, flop*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sunken</td>
<td>Dry</td>
<td>Thirsty, drinks eagerly*</td>
<td>Very sunken</td>
<td>Very dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Too ill to drink*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feel</th>
<th>Skin pinch</th>
<th>Goes back quickly</th>
<th>Normal</th>
<th>Goes back slowly*</th>
<th>Goes back very slowly*</th>
<th>Goes back very slowly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fontanelle</td>
<td>Slightly sunken</td>
<td></td>
<td>Slightly sunken*</td>
<td>Very sunken*</td>
<td>Very sunken*</td>
</tr>
</tbody>
</table>
Other problems:
- If blood in stool treat for bacillary dysentery
- If diarrhoea has lasted 14 days, severe malnutrition, refer to Hospital for investigation.
- If temperature is 39º Celsius or higher, look for other causes of fever and treat

**Non drug treatment:**
Treatment strategy includes a stepwise approach with modification of the diet, which are not mutually exclusive and are applied according to local resources.
- monitor hydration, stools, nutritional status, weight gain, growth and other nutritional parameters such as serum proteins
- Nutritional support - aim to provide at least 110 kcal/kg/day orally within three days to protect nutrition.

<table>
<thead>
<tr>
<th>Diet A: Starch-based, low lactose diet</th>
<th>Diet B: Lactose free diet with reduced starch</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Full-fat dried milk 11g</td>
<td>• Finely ground cooked chicken 12g</td>
</tr>
<tr>
<td>Or</td>
<td>Or</td>
</tr>
<tr>
<td>Whole liquid milk 85 ml</td>
<td>Whole egg 64 g</td>
</tr>
<tr>
<td>And</td>
<td>And</td>
</tr>
<tr>
<td>• Cooked rice 15g</td>
<td>• Cooked rice 3 g</td>
</tr>
<tr>
<td>• Vegetable oil 3.5g</td>
<td>• Vegetable oil 4 g</td>
</tr>
<tr>
<td>• Cane sugar 3 g</td>
<td>• Glucose 3 g</td>
</tr>
<tr>
<td>• Water to make 200 ml</td>
<td>• Water to make 200 ml</td>
</tr>
<tr>
<td>Mix together in a liquidizer.</td>
<td>Mix together in a liquidizer.</td>
</tr>
</tbody>
</table>

100 g provides:
- Energy: 83 kcal
- Protein: 11% of calories
- Lactose: 3.7g/kg/day

100g provided:
- Energy: 70 kcal
- Protein: 11% of calories

Feed at 120 mL/kg/day
Feed at 150 mL/kg/day
**If the response is good:**
Give additional fruit and well-cooked vegetables to children who are responding well.
After 7 days of treatment with an effective diet, resume an appropriate diet for age, including milk, which provides at least 110 calories/kg/day.
Follow up regularly to ensure recovery from diarrhoea, continued weight gain and adherence to feeding advice

**Drug Treatment:**
Antibiotics only in dysentery and suspected cholera
Never use anti-diarrhoeal drugs and anti-emetics in children since they do not reduce fluid and electrolyte loss and may cause adverse effects.

- Reduce the duration and severity of diarrhoea and occurrence of future episodes by giving supplemental Zinc
- Treating or preventing dehydration and electrolyte imbalance with low-osmolarity ORS or some home prepared fluids.

**Composition of fluids:**
1. “Home fluids” are any fluids including water, tea, thin porridge, maize-based Salt/Sugar Solution (SSS), but avoiding cold drinks with high sugar content.

2. **Low Osmolarity ORS**
   Low osmolarity ORS (245mmol/lt) has been observed to be more effective than the Standard ORS in especially preventing dehydration.
Constitution of Low Osmolarity ORS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Grams/litre</th>
<th>Ingredient</th>
<th>mmol/Lt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium chloride</td>
<td>2.6</td>
<td>Sodium</td>
<td>75</td>
</tr>
<tr>
<td>Trisodium citrate dehydrate</td>
<td>2.9</td>
<td>Citrate</td>
<td>10</td>
</tr>
<tr>
<td>Potassium chloride</td>
<td>1.5</td>
<td>Potassium</td>
<td>20</td>
</tr>
<tr>
<td>Glucose, anhydrous</td>
<td>13.5</td>
<td>Glucose, anhydrous</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chloride</td>
<td>65</td>
</tr>
<tr>
<td><strong>Total Weight</strong>&lt;br&gt;(Gram/Litre)</td>
<td><strong>20.5</strong></td>
<td><strong>Total osmolarity</strong>&lt;br&gt;(mmol/Lt)</td>
<td><strong>245</strong></td>
</tr>
</tbody>
</table>
## Outline of practical fluid therapy of dehydrating watery diarrhoea

<table>
<thead>
<tr>
<th>EVALUATION</th>
<th>SHOCK Needs resuscitation</th>
<th>Severe dehydration Needs urgent fluids and resuscitation</th>
<th>Moderate dehydration Needs oral rehydration</th>
<th>Not obviously Dehydrated Potential dehydration for home treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Start IV drip and give:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ringer-Lactate, IV 20 ml/kg in 10-20 minutes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reassess after 20 minutes:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse, circulation, capillary filling time.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Still severely dehydrated or in shock?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• YES</td>
<td>Move to column 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• IMPROVED, PASSING URINE</td>
<td>Move to column 2, Continuation phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Give supervised ORs for 4-6 hours.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Start with small amounts: Increase to offer 15-20 ml/kg/hour in small frequent slips.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If patient wants more, after more. Do not allow child to drink large volumes because of risk of vomiting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If child vomits, wait 10 minutes and give again in small frequent quantities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reassess after 4 hours: Hydration better, not vomiting, wanting food?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• YES</td>
<td>State small feeds including breastfeeds, follow with additional ORS as in next column</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If hydration maintained</td>
<td>Well on drip rate less than 5 ml/kg/hour, consider stopping the drip</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NO</td>
<td>Evidence of shock? Resuscitate as before</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydration worse? Check fluid administration (how much given?). Consider drip or increase oral fluids.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Urea and electrolytes blood gases if necessary after resuscitation. Finger pricks blood glucose. Urine by urine test strips</td>
<td>Urea and electrolytes blood gases after resuscitation. Finger prick blood glucose. Urine by urine test strips</td>
<td>Finger pricks blood glucose. Urine by urine test strips</td>
<td>Urine by urine test strips</td>
</tr>
</tbody>
</table>

**INVESTIGATION**

- Urea and electrolytes blood gases if necessary after resuscitation.
- Finger pricks blood glucose.
- Urine by urine test strips.

- Urea and electrolytes blood gases after resuscitation.
- Finger prick blood glucose.
- Urine by urine test strips.

- Finger pricks blood glucose.
- Urine by urine test strips.

- Urine by urine test strips.

**In Hospital:**
- Discharge once hydration maintained without drip and stools becoming less watery.

**Home management:**
- Diarrhoea must stop within a week. Give extra food for nutritional recovery.
- To come back if stools become bloodstained, diarrhoea not stopping in a week or if caregiver still concerned.

**INVESTIGATION**

- Urea and electrolytes blood gases if necessary after resuscitation.
- Finger pricks blood glucose.
- Urine by urine test strips.

- Urea and electrolytes blood gases after resuscitation.
- Finger prick blood glucose.
- Urine by urine test strips.

- Finger pricks blood glucose.
- Urine by urine test strips.

- Urine by urine test strips.
1. First treat shock, if present
   • Ringer-Lactate, I.V, 20 mL/kg given as a bolus over 10–20 minutes. Repeat the fluid bolus until improvement is achieved up to 3 times. After each bolus reassess for shock.
   After the second bolus, i.e. total of 40 ml/kg has been given with inadequate response, the third bolus is started and the patient should be moved to ICU for CVP monitoring and inotropic support.
   After stabilisation of the circulation, continue with maintenance fluid volumes according to the age of the patient – (see: 2. Severe dehydration)

   If an I.V infusion cannot be set up within 5–10 minutes use an intraosseous infusion.

2. Severe dehydration
   • Ringer-Lactate, I.V, 20 mL/kg given as a bolus over 10–20 minutes or 30 mL/kg in first hour
   Continue with
   • Darrow’s half strength with 5% Dextrose, I.V at 10 mL/kg/hour
   Give more if stool output is very high.
   Allow oral sips once shock is controlled and no ileus.
   Review after 4 hours: general condition, capillary filling time, passing urine, number of watery stools and level of consciousness.
   If no improvement, repeat fluid bolus and increase fluid administration to 15 ml/kg/hour depending on the extent of ongoing diarrhoea.
   Review after 4 hours.

   If improved and alert and not vomiting, introduce oral rehydration fluid at an increasing rate of 5–15ml/kg/hour or more in small frequent sips and reduce I.V fluid rate by 5 ml/kg/hour.
   Review in 4 – 6 hours.
   As patient takes more ORS without vomiting, reduce the I.V rate.
   Once hydration corrected, offer small feeds as tolerated and supplement freely with ORS after feeds and extra for every watery stool. Discontinue I.V drip once rate less than 5 ml/kg/hour.

3. Moderate dehydration for oral rehydration
   • Low osmolarity ORS, oral, 80 mL/kg over 4 hours using frequent small sips
   Give more if the child wants more.
   Show the caregiver how to give ORS with a cup and spoon.
   If child vomits wait 10 minutes and then continue more slowly.
Encourage caregiver to continue feeding the child, especially breastfeeding
Review after 4 hours.

After 4 hours:

<table>
<thead>
<tr>
<th>If there are signs of shock</th>
<th>Treat for shock, and change to the I.V regimen as in 2 above</th>
</tr>
</thead>
<tbody>
<tr>
<td>The dehydration has continued without improvement or if it has become worse</td>
<td>Change to I.V regimen indicated in 2 above</td>
</tr>
<tr>
<td>If still some dehydration signs but improving</td>
<td>Continue same protocol</td>
</tr>
</tbody>
</table>

Zinc
The use of Zinc during diarrhoea has been shown to reduce frequency, stool volume and recurrence of diarrhoea episode.

All children with diarrhoea should be given Zinc:
2-5 months: 10 mg per day;
Above 5 months: 20 mg per day (for 10-14 days)

**Note:** Zinc treatment should be continued even after diarrhoea has stopped

1.4 Gastroenteritis  
**Description/clinical features:**
This is an infectious (usually viral) diarrhoeal illness associated with abdominal pain, nausea and vomiting. It tends to affect infants and young children. It occurs in epidemics, and causes severe dehydration, and occasional deaths.

**Management:**
Manage as other types of diarrhoea.
If vomiting is severe, rehydrate as above and refer.

1.5 Dysentery  
**Description/clinical features:**
Dysentery refers to severe diarrhea with blood in it. There are two types of dysentery - Bacillary (usually Shigella) and Amoebic.
• Bacillary (Shigella) Dysentery usually occurs in epidemics. It is caused by bacteria (Shigella). Fever is usually present and the patient is toxic. It is usually self-limiting.
• Amoebic Dysentery (Amoebiasis). This is less common. Patients tend to have foam stools. There is usually no fever. Complications include amoebic liver abscesses.

**Non drug treatment:**
• Monitor fluid and electrolyte balance
• Ensure adequate nutrition and hydration

**Drug treatment:**
**Adults:** Ciprofloxacin 500mg, oral, 12hourly for 5 days.
**Or**
If hospitalized or if unable to take oral antimicrobial agents Ceftriaxone, I.V, 20 – 80 mg/kg as single daily dose for 5 days.
**Children up to 2 years:** Erythromycin 125mg, 6hourly for 5 days
**Children 2- 8 years:** Erythromycin 250mg, 6hourly for 5 days
**Above 8 years:** Erythromycin 250-500mg, 6hourly for 5 days.
**Pregnant women:** Erythromycin 250-500mg 6 hourly for 5 days.

If amoebic dysentery treat as *Intestinal amoebiasis*.

**Prevention:**
• Improve personal hygiene
• Proper preservation of food

**Referral Criteria:**
Dysentry with complications e.g. persistant shock, haemolytic uraemic syndrome and toxic megacolon

1.6 **Cholera**

**Description/Clinical features:**
*THIS IS A NOTIFIABLE DISEASE.*
Cholera is an acute intestinal disease characterized by sudden onset profuse watery (rice water) stools, vomiting, rapid dehydration and circulatory collapse.
The disease usually comes in epidemics and strikes many people at once. It is usually worse in older children and adults. Dehydration may be extreme, especially once vomiting occurs.

**Non drug treatment:**
• Isolate patients and institute barrier nursing
• Ensure adequate nutrition, Start feeding 3-4 hours after rehydration
begins.
• Ensure adequate hydration

**Drug treatment:**
Rehydration is the most important step; orally in moderate cases, I.V (using ringer lactate) in more severe cases.
Start antibiotics (see below) after the patient is rehydrated and vomiting has stopped, usually after 4-6 hours. Although the disease is self-limiting, an effective antibiotic will reduce the volume of diarrhoea and shorten the period during which *Vibrio cholera* is excreted. Preferably, give antibiotics (especially **Doxycycline**) with food to minimize vomiting.

**Moderate Dehydration:**
Give Oral rehydration, approximately 75-100ml/kg in the first four hours. Reassess after four hours; if improved, continue giving low-osmolarity ORS, in quantity corresponding to losses (eg after each stool) or 10 to 20ml/kg. If not improved, treat as severe.

**Severe dehydration:**
Give I.V fluid Ringer’s Lactate (I.V) 100ml/kg immediately as follows:

**Age below 1 year:** 100ml/kg within 6 hours
Start with 30ml/kg in the first hour, then 70ml/kg over the next five hours.

**Age above 1 year:** 100ml/kg within 3 hours
Start with 30ml/kg within half an hour, then 70ml/kg over the next two and half hours.
Monitor frequently; give low-osmolarity ORS in addition to I.V fluids as soon as able to drink.
Reassess after 4 hours; if improved, treat as moderate dehydration and if still severe continue with I.V fluids.

**Antibiotics**
**Adult and children above 12 years** - Doxycycline 300 mg, oral, as a single dose or 5mg/kg single dose
**Or**
**Adult:** Erythromycin, oral, 500mg, 8 hourly for 5 days
**Children up to 2 years:** Erythromycin 125mg, 6 hourly for 5 days
**Children 2-8 years:** Erythromycin 250mg, 6 hourly for 5 days
**Above 8 years:** Erythromycin 250-500mg, 6 hourly for 5 days.
Plus
Folic acid 5mg, oral, once daily for the duration of the treatment.

**Note:** Doxycycline should not be used in pregnancy and children below 12 years

**Prevention:**
Use Latrine and maintain personal hygiene
Wash hands before meal and after using toilet.
Wash fruits and vegetables before eating.
Drinking treated or boiled water

**Referral Criteria:**
Cholera with complications e.g. persistant shock renal failure severe electrolytes disturbances.

1.7 **Food poisoning**

*Description/clinical features:*
Illness effecting digestive system result from eating food which is contaminated either by bacteria or bacteria toxins.

*Drug Treatment:*
Manage diarrhoea and dehydration as per the diarrhoea management.
Manage vomiting conventionally. Most vomiting is self-limiting and helps the body to get rid of the poisons food.

*Prevention:*
• Avoid under cooked food.
• Feasts are notorious for food poisoning.
• Advise continuously hygienic food preparation.
• Advise on appropriate food preservation

1.8 **Jaundice**

*Description/clinical features:*
This is a yellowish discoloration of the body tissues including sclera (white of the eye) and skin due to increased bilirubin concentration in the blood. Jaundice can be caused by:
• Heavy destruction of red blood cells (RBC) e.g. in Malaria.
• Disease of the liver itself, e.g. in Hepatitis.
• Blockage of the bile duct e.g. in Gallstones, cancer.
Types of Jaundice:
Physiological Jaundice - takes about 14 days.
Prolonged Jaundice - takes up to 21 days.
Kenicterus Jaundice (Severe) more than 35mc mol/Lt needs blood exchange

1.8.1 Physiological Jaundice
Description/clinical features:
Is a condition occurring in newborn babies and refers to the process of jaundice developing after the first 48 hours and disappearing after a week. This is a normal process resulting from immaturity of the liver. The condition is more severe in premature low birth weight infants.

Non drug treatment:
• Mild physiological jaundice.
• Phototherapy helps to reduce the jaundice.

Advice:
• Mother to expose the child’s skin to sunlight for half an hour a day.
• Mother to return if the jaundice worsens.

Referral Criteria:
• Jaundice beginning after the first 24 hours of life.
• Jaundice beginning after the first week of life.
• Premature or low birth weight infants with marked jaundice.

1.8.2 Prolonged Jaundice
Description/clinical features:
Jaundice for more than 10 days in term infant and 14 days in a preterm infant (static or rising bilirubin). The usual cause are:
• Breast milk jaundice
• Hypothyroidism
• Hepatitis
• Galactosaemia
• Infections e.g. UTIs

Non drug treatment:
Monitor by bilirubin level.
Dietary adjustment
Dietary adjustment for prolonged conjugated hyperbilirubinaemia to counteract the malabsorption of fat and fat soluble vitamins (A, D, E, K)
Avoid lactose containing feeds that is breast milk and lactose containing formulae when galactosaemia is suspected.
Regular follow up until underlying condition has been resolved.
**Drug treatment:**
Fat soluble vitamins (A, D, E, K)

**Advice:**
Continue breastfeeding.

**Referral criteria:**
Pathological Jaundice, conjugated and/or unconjugated, where the underlying cause can not be identified.
Serum unconjugated bilirubin at exchange transfusion level.
Jaundice unconjugated and /or conjugated not improving on adequate treatment.
Conjugated hyperbilirubinaemia due to conditions requiring surgical interventions e.g. biliary atresia.
Prolonged neonatal Jaundice excluding breast milk Jaundice.

1.8.3 Drug Jaundice

**Description/clinical features:**
Some drugs are destructive to liver cells resulting in jaundice. These drugs include Paracetamol, anti tuberculosis drugs, Oral contraceptives, Antiretroviral drugs (ARVs) and Chlorpromazine.
The jaundice is usually temporary and disappears after the drug is stopped.

**Management:**
- Stop the drug causing the jaundice immediately. If the patient is taking several drugs and you are not sure which it is, stop all drugs.
- Refer the patient. Patient who has taken a drug overdose especially Paracetamol.

1.9 Hepatitis

**Description/Clinical features:**
This is usually an acute viral illness presenting with fatigue, loss of appetite, nausea and weight loss. It can last many weeks and occasionally can take many months.
Hepatitis A and B are very common. Other types of hepatitis include C, D, E and F
Hepatitis C is very common for the liver cancer.
Hepatitis is caused by one of the hepatotropic viruses usually obtained from blood product, sexual intercourse, intravenous drug abusers, etc.
Hepatitis A and E only cause acute hepatitis, whilst B and C cause acute and chronic hepatitis.
**Non Drug Treatment:**
Strict bed rest until acute phase is over

**Drug Treatment:**
There is no specific treatment.
For nausea and vomiting:
Metoclopramide I.V/Oral, 10mg, 8 hourly is required

In case of hepatitis encephalopathy:
- Dextrose, I.V, 500ml + Vitamin B complex, I.V, 10ml, once a day for 5-7 days.
- Lactulose 10ml, oral, 12 hourly for 5-7 days.

In fulminate hepatitis, use of steroids is recommended.
Prednisolone, oral, 2mg/kg body weight in 3 divided doses for 5 - 7 days

**Advice:**
- Low protein (fish, meat, eggs etc)
- Low fat
- High carbohydrate
- No alcohol
- Careful disposal of excreta
- Good personal hygiene – hand washing.

**Prevention:**
Hepatitis B can be prevented by immunization with DPT-Hepatitis B vaccine
Avoid direct contact with patient-plasma fluid

**Referral Criteria:**
Refer all complicated cases.

1.10 **Acute Abdomen**
**Description/Clinical features**
Suspect this condition when a patient presents with abdominal pain and/or swelling with tenderness. Rebound tenderness is usually present.
Examples include suspected acute appendicitis, gall bladder infection. It assumes the infection of bacteria.

**Note:** Quick investigation and treat immediately according to the condition.
**Non drug treatment:**
- Treat shock if present
- No food or fluids by mouth. (Sips of water are permitted).
- Surgical interventions if necessary

**Drug treatment:**
Rehydrate as required by I.V infusion

**Adult:** Ampicillin 500mg, I.V/I.M, every 4 – 6 hours

**Children under 10 years:** half the adult dose.
Do not give analgesics. This may cause the diagnosis at hospital to be difficult.

**Referral Criteria:**
Refer to the surgeon in case of acute abdominal pain.

1.11 Rectal Prolapse

**Description/Clinical features**
This is a condition seen in children. It is usually a complication of worms, chronic diarrhoea or chronic cough and malnutrition.

**Non Drug Treatment**
Treat conservatively.
- Reduce prolapse (with moist cloth) using gentle pressure
- Strap the buttocks for 2-3 days.
- Try to keep the child lying down. This is difficult.
- Treat underlying condition (diarrhoea, worms, malnutrition).

**Prevention**
Early treatment of worms, diarrhoea and malnutrition.

**Referral criteria**
- Recurrent prolapse
- Damage to the rectal lining (mucosa)

1.12 Haemorrhoid and other peri-anal conditions

**Description/Clinical features**
This is a condition of enlarged veins around the anus. Common clinical feature is the passage of bright red or blood coating of stool. Pregnant women are predisposed.
**Non Drug Treatment**
Mild cases can be treated conservatively with dietary advice (plenty of fruit, vegetables, fluids), to ensure the stool is kept soft and constipation is avoided as well as careful anal hygiene.

**Drug treatment**
Treat for constipation if necessary.
Give bisacodyl 5-10 mg orally or bisacodyl suppository (PR) 10 mg at bedtime.
Annusol suppositories, Per rectum, 1tab after each bowel movement. **Or** cream.

Pregnant women should be treated conservatively. The haemorrhoids usually resolve after delivery.

**Referral criteria:**
- Severe cases or recurrent cases. These include failure to respond to simple treatment.
- Significant bleeding or inflammation
- Severe pain
- Very large haemorrhoids
CHAPTER 2

2.0 PARASITIC DISEASE

2.1 Malaria

*Description/Clinical feature:* Malaria is a common but serious acute febrile tropical disease. It is caused by protozoal infection transmitted to humans by mosquitoes biting which occurs mainly between sunset and sunrise. Human malaria is caused by four species of *Plasmodium* protozoa: *Plasmodium falciparum*, *P. vivax*, *P. ovale* and *P. malariae*. Almost all (more than 90%) malaria cases in Zanzibar are caused by *P. falciparum*.

Malaria may manifest clinically either as an acute uncomplicated disease or as severe malaria. A careful assessment of all patients with suspected malaria is essential in order to differentiate between the acute uncomplicated and severe disease, as this has treatment and prognostic implications.

2.1.1 Uncomplicated malaria

Clinical features of uncomplicated malaria include fever, headache, joint pain, malaise, vomiting, and/or diarrhoea, chest pain, poor appetite and body weakness.

*Non drug treatment:* If high fever rapid sponging to avoid febrile convulsions Give more fluid

*Drug treatment:*

*First choice:* Co-administration of Artesunate at a dose of 4mg/kg And Amodiaquine at a dose of 10mg/kg daily for 3 days.
Second choice:
Co-artem (1.3mg/kg Artemether + 4mg/kg Lumefantrine)
Less than 5kg – not recommended
5 – 14kg – 1 tablet 12 hourly for 3 days.
15 – 14kg – 2 tablets 12 hourly daily for 3 days.
25 – 34kg – 3 tablets 12 hourly daily for 3 days.
Above 35kg - 4 tablets 12 hourly daily for 3 days.

2.1.2 Severe malaria
Convulsions, altered consciousness, acute renal failure, severe anaemia (less than 5mg/dl), haemoglobinuria, bleeding tendency (DIC), jaundice, pulmonary oedema, hypoglycaemia (less than 2.2 mmol/l) and shock.

Drug treatment
First Choice:
• Quinine I.V. 20mg/kg in 10ml/kg of 5% Dextrose over 4 hours (loading dose), then 10mg/kg in 10ml/kg 5% Dextrose over 4 hours every 8 hours till arousal, then 10mg/kg every 8 hours orally to complete a total of 21 doses (7 days).
Or
If I.V line is not possible give
• Quinine, I.M,10mg/kg diluted four-fold in water for injection or Normal saline to a concentration of 60mg/ml.
• Administration of oral Quinine to complete treatment, 10mg/kg every 8 hours for 7 days.

Second Choice:
Injection Artemether can be used instead Quinine
Artemether Injection, 3.2mg/kg as loading dose, then 1.6mg/kg, I.M, once a day for 4 days

General measures for severe malaria treatment
Coma (cerebral malaria): maintain airway, nurse on side, and exclude other causes of coma (e.g. hypoglycaemia, bacteria meningitis)

Hyperpyrexia: fanning, paracetamol

Convulsions: Give Inj. Diazepam 0.15 – 0.3mg/kg slowly.
       Oral /Rectum 0.5 – 1mg/kg
If convulsions continue repeat oral/rectal after 10 minutes, if still no response repeat again after another 10 minutes.
If convulsions still continues give Phenobarbitone – 15 -20 mg/kg loading dose (start) then 6mg/kg/day in two divided doses (12 hourly) as maintenance dose.

**Caution:** Do not give Diazepam to the children under one month.

**Hypoglycaemia:** urgent and repeated blood glucose screening;
Children: give 5 mls/kg of 10% Dextrose
**Or**
2.5 mls/kg of 25% Dextrose as bolus; if 50% Dextrose solution is available, it should be diluted to make 25% by adding an equal volume of water for injection or Normal saline.
**Adults:** give 125 mls of 10% Dextrose
**Or**
50 mls of 25% Dextrose as bolus
Where dextrose is not available, sugar water should be prepared by mixing 20 gm of sugar (4-level tea spoons) with 200 ml of clean water. 50 ml of this solution is given orally or by naso-gastric tube if unconscious.

**Severe anaemia:** transfusion of packed cells if Hb equal or less than 4 g/dl and/or signs of heart failure and/or signs of respiratory distress

**Acute pulmonary oedema:** review fluid balance and run patient on “dry side” but avoiding inadequate perfusion of kidneys; set up Central Venous pressure (CVP) line, give oxygen. Intubation/ventilation may be necessary

**Acute renal failure:** exclude pre-renal causes, check fluid balance and urinary sodium. If adequately hydrated (CVP>5cm) try diuretics. Haemodialysis /haemofiltration should be started early in established renal failure.

**2.1.3 Malaria in pregnancy**
Malaria infection during pregnancy posses a substantial risk to the mother, foetus and the newborn infant. Intermittent presumptive treatment (IPT), use of insecticide treated nets (ITN) and prompt, appropriate case management are three important aspects towards reducing the burden of malaria in pregnancy.
**Drug treatment:**
First line medicine of choice for the treatment of uncomplicated malaria during first trimester of pregnancy is Oral Quinine. Alternatively Injection Artemether - 3.2mg/kg for the 1st day then 1.6mg/kg, I.M, daily for 4 days
In 2nd and 3rd trimester give as usual uncomplicated malaria.

**Severe malaria during pregnancy** should be treated with I.V Quinine (dose as usual)
**Or**
Artemether Injection - 3.2mg/kg for the 1st day then 1.6mg/kg, I.M, daily for 4 days

**Advice:**
Early care seeking and completion of anti malaria dose

**Prevention:**
- Use of insecticide treated nets
- Environmental sanitation
- Indoor Residual Spray
- Use of mosquito repellants

**Referral Criteria:**
If develop signs of severe or complicated malaria.

### 2.2 Schistosomiasis
**Description/clinical features:**
Schistosomiasis is a slowly progressive disease caused by blood flukes of the class Trematoda. There are three major species: Schistosoma mansoni and S. japonicum infect the intestinal tract; S. haematobium infects the urinary tract. The common species found in Zanzibar is S. haematobium.

The degree of infection determines the intensity of illness. Complications - such as portal hypertension, pulmonary hypertension, heart failure, ascites, hernatemesis from ruptured esophageal varices, and renal failure - can be fatal.

**Drug treatment:**
Praziquantel 40 mg/kg as a single dose with meal
Note: Between 3 and 6 months after treatment, the patient will need to be examined again. If this checkup detects any living eggs, treatment may be resumed.

**Prevention:**
Use latrines.
Avoid bathing and direct contact in contaminated water.

**Advice:**
- Advice on preventive measures to avoid infecting others.
- Do not urinate into ponds or streams.

**Referral Criteria**
- Persistent haematuria (visible or on testing) one week after treatment has been completed.

### 2.3 Filariasis
**Description/clinical features:**
Is an infection spread by mosquitoes, which breed in:
- Septic tanks, latrines and drains in urban areas
- Water holes, ditches, along banks of streams, in water containers – in rural areas.

This is a group of disorders caused by infection with small nematode worms.
Acute infection (fever, acute lymphangitis, orchitis, headache, asthma, and urticaria) can easily be missed. It should be suspected in any febrile patient in an endemic area.

**Drug treatment:**
Ivermectin 150mg/ kg and Albendazole 400mg, oral, stat with meal

**Prevention:**
**In the community**
- By controlling the vector (Mosquitoes), this can be achieved through insecticides, larvicidal and/or environmental management. Environmental management is the cheapest and most effective method. It can be done by the community itself. Drain ditches and holes, clear bush etc.
In the individual
• Avoid being bitten by mosquitoes, by self-protection (clothes, repellents) screening houses, using mosquito nets.

Referral Criteria:
• Suspected cases in non–endemic areas.
• Chronic cases, for assessment for surgical treatment of hydrocele and some times elephantiasis of legs.
CHAPTER

3

3.0 RESPIRATORY TRACT INFECTION (RTI)

3.1 Wheezing

Description/clinical features:
A wheeze is a continuous, coarse, whistling sound produced in the respiratory airways during breathing. For wheezes to occur, some part of the respiratory tree must be narrowed or obstructed, or airflow velocity within the respiratory tree must be heightened. Wheezing is commonly experienced by persons with a lung disease; the most common cause of recurrent wheezing is asthma. In a young infant below 3 months, wheezing is a sign of serious illness. Wheezing for infants between 3 and 12 months may be due to bronchiolitis a viral infection. In Children more than 1 year wheezing may be due to Asthma

Drug treatment:
Bronchodilator in Children 1-5 years
If a rapid acting bronchodilator is required
First Choice:
• Adrenaline 1:1000, subcutaneous (S.C) 0.01 ml/kg body weight up to maximum of 0.25 ml may be repeated after 20 minutes.
Oral bronchodilator (for Children 1-5 years)
• Salbutamol oral, 0.4 mg/kg/day divided in 3-4 doses for 5 days
• Salbutamol nebulised diluted with Sodium chloride 0.9% to a total volume of 4-5ml and nebulise over 20 minutes

3.2 Croup

Description/clinical features:
Croup is acute laryngotracheobronchitis which occurs in young children (usually between 6 months to 3 years of age) and arises as a result of narrowing of the airway in the region of the larynx. The most common cause
is viral infection (particularly parainfluenza viruses) but may also be
due to bacterial infection. The obstruction is due to inflammation and
oedema.
The symptoms include paroxysmal ‘barking’ cough and insipiratory
stridor, fever, wheezing and tachypnoea. Such symptoms usually
occur at night. Respiratory failure and pneumonia are potentially fatal
complications.

**Non Drug Treatment:**
No stridor at rest, do not give antibiotics.

**Referral criteria:**
Stridor at rest or chest in drawing or fast breathing **REFER
IMMEDIATELY** to higher level Hospital.

**Mild Croup**
Only stridor when upset, no moderate/severe ARI
Likely of viral origin
Home care – steam inhalation
Antibiotics **NOT** required

**Severe Croup (Laryngotraceheobronchitis)**
Stridor in a calm child at rest
Chest in drawing

**Management Guideline**
Do not examine throat – likely bacterial origin

**Drug Treatment:**
**First Choice:**
**Adult:** Amoxycillin 500mg, oral, 8 hourly for 7 days
**Child up to 8 years:** Amoxycillin125 mg, oral, 8 hourly for 7 days

**Second Choice:**
Chloramphenicol, oral, 12.5 mg/kg body weight, 8 hourly for 7
days.

3.3 **Laryngeal Diphtheria**
**Description/clinical features:**
Is an infection caused by *Corynebacterium diphtheriae*. It is directly
transmitted from person to person by droplets. Children between
1-5 years of age are most susceptible although nonimmune adults
are also at risk. Diphtheria may be asymptomatic or symptoms are characterized by grayish-white membrane, composed of dead cells, fibrin, leucocytes and red blood cells is seen as a results of inflammation due to multiplying bacteria.

**Drug treatment:**
Gently examine the child’s throat – can cause airway obstruction if not carefully done.
Procaine penicillin, I.M, once daily for 7 days

**Note:** Tracheotomy may be required for airways obstruction.

### 3.4 Pneumonia

#### Description/clinical features:
Pneumonia is a severe form of acute lower respiratory infection that specifically affects the lungs, and accounts for a significant proportion of the ALRI disease burden. When a person has pneumonia, pus and fluid fill the alveoli in one or both lungs, which interfere with oxygen absorption, making breathing difficult.
Pneumonia can either be primary (to the causing organism) or secondary to pathological damage in the respiratory system. The common causative organism for pneumonia are bacterial (e.g. *streptococcal, pneumococcal, Haemophilus influenzae*, staphylococcal and Mycoplasma pneumonia, viral or parasitic e.g. *pneumocystis carinii*).
The important clinical features are high fever (39°C), cough (dry or productive), central cyanosis, respiration distress, chest pain and tachypnea.

#### Prevention:
- Vaccination (against measles, whooping cough) will prevent pneumonia from those diseases, particular in children.

### 3.4.1 Acute Respiratory Infection (ARI) in Children

Acute respiratory infection (ARI) includes any infection of the upper or lower respiratory system.
Acute lower respiratory infections (ALRI) affect the airways below the epiglottis and include severe infections, such as pneumonia.
The important symptoms in children under five years of age are coughing or difficult breathing.
Classification of pneumonia in children is based on respiratory rate which is either fast breathing or chest drawing.
Fast breathing is defined as
- Respiratory rate above 60, age less than 3 months
- Respiratory rate above 50, age between 3 months and 5 years
- Chest indrawing is when the lower part of the chest moves in when the child breathes in.

**Important clinical feature of pneumonia in under-fives**

<table>
<thead>
<tr>
<th>AGE</th>
<th>SIGNS</th>
<th>CLASSIFICATION</th>
</tr>
</thead>
</table>
| Infants less than 2 months | • Severe chest in drawing **Or**  
• 60 breaths per minute or more | Severe pneumonia (all young infants with pneumonia are classified as severe) |
|                      | • No severe chest in drawing  
• Less than 60 breaths per minute | No pneumonia: Cough or cold                                                   |
|                      | • Chest in drawing                       | Severe pneumonia                                                              |
| Children from 2 months to 1 year | • No chest in drawing  
• 50 breaths per minute or more | Pneumonia                                                                      |
|                      | • No chest in drawing  
• Less than 50 breaths  
• Per minute               | No pneumonia Cough or cold                                                    |
|                      | • Chest in drawing                       | Severe pneumonia                                                              |
| Children from 1 to 5 year | • No chest in drawing  
• 40 breaths per minute or more | Pneumonia                                                                      |
|                      | • No chest in drawing  
• Less than 40 breaths per minute | No pneumonia Cough or cold                                                    |
### Treatment guidelines

<table>
<thead>
<tr>
<th>Age</th>
<th>Classification</th>
<th>Treatment in Primary health care units and health centers</th>
<th>Treatment in Hospitals or when referral is not feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants less than 2 months</td>
<td>Severe Pneumonia</td>
<td>Refer urgently to hospital after first dose of Benzyl penicillin or Chloramphenicol</td>
<td>Benzyl penicillin + Gentamicin</td>
</tr>
<tr>
<td>Children from 2 months to 5 years</td>
<td>Severe pneumonia</td>
<td>Refer urgently to hospital after first dose of Benzyl penicillin or Chloramphenicol</td>
<td>Benzyl penicillin or Chloramphenicol</td>
</tr>
<tr>
<td></td>
<td>Pneumonia</td>
<td>Co-trimoxazole</td>
<td>Co-trimoxazole Alternative Procaine Penicillin fortified or Amoxicillin</td>
</tr>
<tr>
<td></td>
<td>No pneumonia: Cough or cold</td>
<td>No antibiotics Safe cough remedy like tea with honey</td>
<td>No antibiotics Safe cough Remedy like tea with honey</td>
</tr>
</tbody>
</table>

**Note:**
Co-trimoxazole is the drug of choice for treating pneumonia in children, it should however, not be used for infants less than 1 months. Co-trimoxazole is active against important respiratory pathogens such as *S. pneumoniae*, *S. aureus*, and *H. influenzae*. Compliance is good as the medicine is administered twice daily. It is considerably cheaper than procaine penicillin, and the medicine can be given at home.
<table>
<thead>
<tr>
<th>Age Group</th>
<th>Co-trimoxazole</th>
<th>Amoxicillin</th>
<th>Procaine penicillin</th>
<th>Benzyl penicillin</th>
<th>Gentamicin</th>
<th>Chloramphenical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 months (3-5kg)</td>
<td>0.5 ml syrup/kg 12 hourly for 5 days</td>
<td>25mg/kg 6 hourly for 5 days (syrup or 250 mg cap)</td>
<td>50,000U/kg 1daily for 5 days (i.m)</td>
<td>50,000U/kg 6 hourly (i.m)</td>
<td>25mg/kg 8 hourly (i.m) (inj. 10mg.ml)</td>
<td>25mg/kg 6 hourly (i.m) (1gr in 4ml sterile water)</td>
</tr>
<tr>
<td></td>
<td>2.5ml syrup or of 480 mg tab</td>
<td>5ml syrup</td>
<td>200,000 U</td>
<td>200,000 U</td>
<td>1ml</td>
<td>0.5ml</td>
</tr>
<tr>
<td>2 months up to 1 year (6-9kg)</td>
<td>5ml syrup or of 480 mg tab</td>
<td>10ml syrup or 1cap</td>
<td>400,000 U</td>
<td>400,000 U</td>
<td>2ml</td>
<td>1ml</td>
</tr>
<tr>
<td>1 year up to 3 years (10-14kg)</td>
<td>7.5ml syrup or 480mg tab</td>
<td>10ml syrup or 1cap</td>
<td>800,000 U</td>
<td>600,000 U</td>
<td>3ml</td>
<td>1.5ml</td>
</tr>
<tr>
<td>3 years up to 5 years (15-19kg)</td>
<td>7.5ml syrup or 480mg tab</td>
<td>10ml syrup or 1capsule</td>
<td>800,000 U</td>
<td>800,000 U</td>
<td></td>
<td>2ml</td>
</tr>
</tbody>
</table>
Note:
• Avoid Co-trimoxazole in infants less than one month of age
• For the first week of life: Benzyl penicillin plus Gentamycin 12 hourly
• Do not give Chloramphenical to premature neonates. Young infants more than 1 week of age, give Chloramphenical 12 hourly

Advice:
• Encourage deep breathing and coughing
• Simple chest physiotherapy can be taught to the relative who can do it twice a day.
• Fluids and feeding.

Follow up:
Review after 5 days. Give a further 5 days treatment if the infection is not yet cured.

Referral criteria:
Sign of severe disease:
• Respiratory rate > 60/minute (adult)
• Cyanosis (blueness of tongue/mouth)
• Reduced conscious state (drowsiness)
• Convulsions
• Severe dehydration or shock
• Severe under-nutrition
• Severe measles
• Unable to drink.
• Treat shock, dehydration, and convulsions if present.

Complications:
Septicaemia, shock, respiratory failure, heart failure, meningitis, confusions.

3.4.2 Acute Respiratory Infection (ARI) in Adult Community Acquired Infections
First Line management
• Chest X-ray not necessary but preferable for in-patient
**Drug treatment:**

**First Line Treatment:**

**Treatment of Community Acquired Infections**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild pneumonia (treated on outpatient basis)</td>
<td>Amoxicillin 250 - 500mg, oral, 8 hourly</td>
<td>5 days</td>
</tr>
<tr>
<td>Alternative</td>
<td>Co-trimoxazole 960mg, oral, twice daily</td>
<td>5 days</td>
</tr>
<tr>
<td>Severe Pneumonia (in patient)</td>
<td>Benzyl penicillin 1-3 MU, I.V/I.M, hourly (may complete course with Amoxicillin, oral as above)</td>
<td>5 – 7 days</td>
</tr>
<tr>
<td>Or</td>
<td>If compliance doubted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Benzathine penicillin 2.4 MU, I.M, single dose</td>
<td>1 day</td>
</tr>
</tbody>
</table>

**Second line treatment:**

If patient is in respiratory distress, or no response after 3 days of first line treatment, or patient’s condition deteriorates, then investigate.

For interpretation of X-ray and management algorithm, see Section HIV related respiratory conditions (applicable to HIV negative patients with difficult to treat bacterial pneumonias).
## Hospital Acquired Infections

### Table – treatment of Community Acquired Infections

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A typical Pneumonias</td>
<td>Doxycyline 200mg, oral, start then 100 mg daily</td>
<td>7 to 10 days</td>
</tr>
<tr>
<td>Alternative in pregnancy or lactation or children under 12 year</td>
<td>Erythromycin 500mg, oral, 6 hourly</td>
<td>7 to 10 days</td>
</tr>
<tr>
<td>Pneumocystis carinii</td>
<td>Co-trimoxazole, oral 3 to 4 tabs of 480mg, 6 hourly <strong>Plus</strong> Folic acid if cytopenic Alternatively: Dapsone 100mg, daily for those allergic to sulphonamides</td>
<td>14 – 21 days</td>
</tr>
<tr>
<td><em>Pneumonia (PCP)</em> (a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staphylococcal</td>
<td>Cloxacillin 1-2mg, (I.V) 6 hourly <strong>Or</strong> Clindamycin 600mg (I.V/oral) 6 - 8 hourly</td>
<td>14 days</td>
</tr>
<tr>
<td><em>Pneumonia (b)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klebsiella</td>
<td>Chloramphenical 500 mg (I.V) 6 hourly +/- Gentamycin (I.V) 4 to 5 mg/kg 24 hrs in 3 divided doses</td>
<td>10 to 14 days</td>
</tr>
</tbody>
</table>
### Treatment of Hospital Acquired Infections

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empirical treatment until bacteriology available</td>
<td>Ampicillin 1g, (I.V) 6 hourly Plus Gentamycin (I.V) 4 to 5 mg/kg/day in 3 divided doses</td>
<td>7 to 10 days</td>
</tr>
</tbody>
</table>

### 3.5 Asthma

**Description/clinical features:**
This is a chronic inflammation disorder of the airways, characterised by reversible airflow destruction.
There is also inflammation of the bronchial wall.
The symptoms are caused by constriction of bronchial smooth muscle (bronchospasm) oedema of bronchial mucous membrane and blockage of the smaller bronchi with plug of mucus. It can be due to identifiable trigger factors or allergens (extrinsic asthma) and is characterized by dyspnoea, wheezing and tightness of the chest and cough etc.

**Non drug treatment:**
Maintenance therapy should be adequate
Treatment of acute attacks
Avoid heavy exercise

**Note:**
The management of asthma in children is similar to that in adults. Infants under 18 months, however, may not respond well to bronchodilator. Details of asthma medicine treatment in children are given after that of adults below.
Asthma Score

<table>
<thead>
<tr>
<th>Symptom’s (Frequency of Attacks of wheezing)</th>
<th>Score A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waking at night, more than twice weekly</td>
<td>4</td>
</tr>
<tr>
<td>Daily, but not at night</td>
<td>3</td>
</tr>
<tr>
<td>Not daily, but more than once weekly</td>
<td>2</td>
</tr>
<tr>
<td>Less than once weekly or on exercise</td>
<td>1</td>
</tr>
<tr>
<td>None for 3 months</td>
<td>0</td>
</tr>
<tr>
<td>Frequency of use of bronchodilator</td>
<td>Score B</td>
</tr>
<tr>
<td>&gt;4 times daily</td>
<td>4</td>
</tr>
<tr>
<td>1 to 4 times daily</td>
<td>3</td>
</tr>
<tr>
<td>&lt;Once daily</td>
<td>2</td>
</tr>
<tr>
<td>1&lt; Once weekly</td>
<td>1</td>
</tr>
<tr>
<td>None for months</td>
<td>0</td>
</tr>
</tbody>
</table>

Note:
- Scoring system can help to assess the severity of asthma.
- Peak flow meters when available should be used to assess the progress

Asthma score
- Add symptoms score (A) to the frequency of use of bronchodilator score (B). The maximum is 8

Score (A+B)
- Mild asthma 0-3
- Moderate asthma 4-6
- Severe asthma 7-8

3.5.1 Chronic asthma in adults

Drug Treatment:
- Oral beta 2-stimulant is the drug of first choice. It may be used intermittently as needed or on a regular basis:

First choice:
- Salbutamol 2-4mg, oral, one to four times a day
Second choice:
• Aminophylline, oral, 15-116mg/kg/day in 3-4 divided doses (maximum 1100 mg/day)

**Note:** Loading doses required: max. 500 mg/day increase after every 3 days to maintenance.

### 3.5.2 Moderate Asthma in adults
If no response or poor response or troublesome side effects on oral treatment then try beta 2-stimulant in inhaler/aerosol form.

**Note:**
Ensure competence in inhaler technique before stopping oral preparations
Secondary Choice If response still not adequate add
Beclomethasone 5µ 1-4 metered inhalations per dose 3-4 times daily.

**Caution:** Rinse mouth with water after administration

### 3.5.3 Severe Asthma in adults
Same drugs as for moderate asthma, but add:
Prednisolone 2.5 – 10mg, oral, daily to the above therapy, but try to keep the dose as low as it remains effective.

**Nocturnal asthma**
Patients, who get night attacks, should be advised to take their medication on going to bed. If Aminophylline has not been used its addition may be highly beneficial.

**Non drug Treatment of Acute Asthma attacks in Adults**
**General measures:**
Careful monitoring of the patient's condition is essential to assess severity, and to detect improvement or deterioration. In the absence of blood gas facilities, this will depend on close assessment of physical signs such as paradox, use of accessory muscles, color, mental state, etc.

Humidified oxygen by mask at high concentration (6 litres/min) is important.
Consider ventilation in severe cases. A short period (5-10 minutes) of ventilation with ether or halothane may end the attack.

After an acute attack all patients should continue with bronchodilator. A course of high dose prednisolone should be given again with all but the mildest attacks.

Except in mild cases follow up is essential.

**Note:** Treatment regimen of all degrees of asthma should include a steroid, preferably an inhaler formulation

### Acute Attack in Adults

**Drug treatment:**

Adrenaline 1:1000 subcutaneous (S.C) 0.5ml. Repeat at 1-2 hour intervals if necessary.

This is useful when asthma is too severe for inhalation.

**Or**

Aminophylline 50-500mg (I.V) slow (over 20 minutes). if patient has not been taking aminophylline before. If he was on aminophylline give 3mg/kg.

**Plus**

Prednisolone 30-40 mg, oral, once daily for 5 days

### Severe Acute Attacks in Adults

If poor response to initial therapy give Adrenaline as above.

**Plus**

Hydrocortisone 200 mg (I.V) as a single dose, further I.V doses are needed only, if oral dosing is not possible. At the same time, start on Prednisolone 40-60 mg, oral once daily for 5 days. If chest is clear, at this stage steroids can be stopped without prednisolone tapering of the dose, otherwise reduce by 5mg/day a maintenance of 5 mg daily until the patient is reviewed.

**Plus**

Aminophylline 6 mg/kg (I.V), slow over 20 minutes unless the patient was on oral Aminophylline in the past 8 hours, in which case no bolus dose is required.
Acute Attacks in children
The same general measures apply as in adult. Give several puffs of Salbutamol metered inhalation.
If poor response
Add Adrenaline 1:1000 (S.C) 0.01 ml/kg
Or
Aminophylline 4mg/kg (I.V), slow over 10 minutes. Do not give if oral aminophylline was given in the last 8 hours.
Unless response to the above is dramatic and complete, start:-
Prednisolone, oral, 2mg/kg/day in divided doses for 3-5 days.

Severe Acute Attack in children
If response to the above therapy is inadequate, give
5% Dextrose I.V – 100 ml/kg/day
Plus
Aminophylline (I.V infusion) at 0.8 – 1mg/kg/hour
Plus
Hydrocortisone (I.V) 2mg/kg every 4 hours
Change to oral therapy when possible; Prednisolone, oral, 2mg/kg/day for 5 days
# Maintenance therapy in children

<table>
<thead>
<tr>
<th>SEVERITY OF ASThma</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| Mild intermittent, associate mainly with respiratory infections | Intermittent Treatment Salbutamol, oral, 0.15mg/kg/day to the nearest 1 mg) in 2 to 4 divided doses  
**1 to 5 years**: 1 to 2mg, 6 hourly  
**5 to 12 years**: 2 to 4mg, 6 hourly  
**Above 12 years**: 4mg, 6 hourly  
**Or**  
If available salbutamol inhaler intermittently |
| Moderate Frequent, triggered by infection, allergy, exercise etc. | Continuous treatment Salbutamol (oral/Inhalation) as above +/-Sodium cromoglycate Inhaler (if available) 1mg (1 spincap) three to four times a day. Dose may be increased to a maximum of 2 spincaps six times a day. |
| Severe persistent wheeze and/or failure to breath | Add to the Above Beclamethasone inhaler (50 micrograms/puff) 1 to 2 puffs three to four times a day respond to the above (always use a spacer)  
**Or**  
Prednisolone, oral, to 2 mg/kg/day initially, reducing to dose which controls the asthma; then attempt to give on alternative days (5 to 10 mg dose). |

*Note*: Long term prednisolone in children should be avoided unless there is no alternative
Prophylaxis of asthma
Sodium cromoglycate is used in the prophylactic treatment of asthma including exercise-induced asthma. It should however, not be used for acute attacks of asthma as it has no effect on an established asthmatic attack. Sodium cromoglycate should be used regularly. When withdrawing treatment, the dose should be reduced gradually over a period of one week. Sodium cromoglycate should be used for at least 4 weeks before it can be proved as ineffective.

3.6 Chronic Obstructive Pulmonary Disease (COPD)
Description/clinical features:
Chronic obstructive pulmonary disease (COPD) is lung disease that makes it difficult to breathe. Most people with COPD have both emphysema and chronic bronchitis.

The leading cause of COPD is smoking. Between 15 - 20% of long-term smokers will develop COPD. Using tobacco for a long time causes lung inflammation and destroys air sacs in the lungs. (In rare cases, non-smokers who lack a protein called alpha-1 anti-trypsin can develop emphysema.)

Other risk factors for COPD are:
- Exposure to certain gases or fumes in the workplace
- Exposure to heavy amounts of secondhand smoke and pollution
- Frequent use of cooking gas without proper ventilation

Symptoms:
- Cough
- Decreased exercise tolerance
- Shortness of breath (dyspnea) lasting for months to years
- Wheezing

Some people, even those with severe COPD, have few or no symptoms

Non drug Treatment:
Life Style adjustment e.g. smoking cessation
Avoid precipitants e.g. infections inhaled irritants etc
Chest X-Ray to exclude TB, carcinoma or a surgically correctable abnormality e.g a large single bulla.
Pulmonary rehabilitation, including exercise rehabilitation and cough techniques.
Psychological support
Educate patient and family regarding the disease
Ensure adequate nutrition and physical conditioning
Treat complicating Infection early.

**Drug Treatment:**

β₂ stimulants:
Salbutamol metered dose inhaler 200mcg, 4-6 hourly as needed using a larger volume spacer

**Or**
Salbutamol nebulised 2.5-5mg administered:
Undiluted and nebulise over 3 minutes

**Or**
Diluted with 0.9 % Sodium chloride to a total volume of 4-5ml and nebulize over 20 minutes
Repeat 4-6 hourly

**Note:**
Correct use of inhaler therapy technique should be demonstrated and checked regularly by way of placebo inhalers as the majority of patients do not use their inhaler correctly.

### 3.7 Cough

**Description/clinical features:**
Coughing is a protective reflex of the boy’s way of getting foreign substance and mucus out of the respiratory tract. Cough can be a symptom of either upper or lower respiratory tract infection, or may be a consequence of a non-infectious condition such as asthma, aspiration of a foreign body or exposure to smoke. Coughing can be described as dry or wet or productive and non productive.

**Non Drug Treatment:**
Causative/precipitating factors e.g. CCF, asthma; allergies must be established and treated accordingly.
Where causative/precipitating factors cannot be detected, the following treatments may be offered:

**Drug treatment:**
Non-productive irritative cough for adults only
Codeine Cough syrup 1.5 mg, oral, (sedative) 6 hourly

**Or**
Linctus Codeine 5-10 ml, oral, 6 hourly
Expectorants may be used to liquefy viscid secretions.
For Children Health workers can safely recommend:

- Oral hydration (e.g. teas, hot soups)
- Relief of nasal congestion when it interfere with feeding; saline nose drops can be tried
- Use Paracetamol for reduction of high fever when this distresses the child and for relief of pain
- Safe, soothing remedies (e.g. Simple linctus or paediatric simple linctus BP) are useful for both a cough and sore throat.

Other homemade soothing substances include hot tea with honey and lemon or a syrup or glycerol.
Honey however should not be given to children young than one year because of the risk of infant botulism.

**Note:** Infants less than 2 months and exclusively breast-fed infants aged up to six months should not be given any cough preparations. If they have a cold they may be given saline nasal drops. It is recommended to increase fluid intake for children with a cough, continued feeding and being alert for signs of pneumonia or other more serious illness whereby the child must be taken to a health facility for proper management.

**Note:** Antibiotics should never be used routinely in the treatment of cough

### 3.7.1 Whooping Cough

**Description/clinical features:**
Whooping cough is a highly infectious disease caused by *Bordetella pertussis*. It is a childhood disease. The main clinical feature is paroxysmal cough associated with a whoop.

**Drug Treatment:**
In the first week of infection (catarrhal stage)

**First choice:**
- Erythromycin, oral, 10 mg/kg body weight, 6 hourly for 14 days

**Second choice:**
- Chloramphenicol, oral, 12.5 mg/kg body weight, 6 hourly for 14 days
Prevention:
Whooping cough is preventable by immunization with pertussis vaccine contained in DPT triple vaccine. It is advisable to start giving it at the age of 6 weeks and repeated twice at 4 weeks interval.

3.8 Allergic rhinitis
Description/clinical features: Allergic rhinitis is caused by sensitivity reaction in the blood vessels of the nasal mucosal e.g. due to pollen, animal hair or feathers. It is characterized by nasal obstruction, bouts of sneezing and excess nasal discharge which is usually watery but occasionally thick and mucoid.

Drug Treatment: Attempts should be made to identify the responsible allergen – which should then be avoided whenever possible. Desensitization for specific allergens should be done.

Cetirizine 10mg, oral, 12 hourly,
Or Chlorpheniramine 4mg, oral, 8 hourly
Or Promethazine 25mg, oral, 12 hourly
For patients unresponsive to antihistamines Prednisolone 15-30mg, oral, 12 hourly and then gradual tapering is recommended.
Children: Ephedrine, oral, 0.5 mg/kg body weight, 8 hourly
Or Chlorphaniramine, oral, 0.1 mg/kg weight, 8 hourly
Or Promethazine, oral, 0.25 – 0.5 mg/kg body weight, 12 hourly
If unresponsive to antihistamines give Prednisolone, oral, as for adult dose above
Surgery is indicated in the presence of polyps and drainage of purulent sinuses.

3.9 Tuberculosis and Leprosy

3.9.1 Tuberculosis
Description/clinical features: Tuberculosis is a chronic bacterial infection, debilitating disease caused by Mycobacteria, the most common of which is Mycobacterium tuberculosis. Less frequently, it can be caused by Mycobacterium bovis and Mycobacterium africanus. The clinical picture is quite variable
and depends on the specific organ affected by the disease. The disease can take the following forms: Pulmonary, meningitis, lymphadenitis, osteoarticular, potts disease, intestinal, renal, peritoneal and cutaneous. Due to the association of TB and HIV infection, the prevalence of TB is increasing and patients are more seriously ill than before. Tuberculosis is a public health problem and all cases must be notified to the Ministry of Health and Social Welfare.

**Control of Tuberculosis**

**Important key points are:**

• Treatment should be short, effective and provided free of charge
• TB services should reach all areas, integrated in Primary Health Care (PHC) system and ensure widespread use of BCG vaccination and case finding (especially sputum positive patients)

**Prevention:**

BCG vaccination is given at birth or at first contact with the child after birth. It is given intradermally on the right upper arm, above the insertion of the deltoid muscle.

**Note:**

The batch number of the vaccine and the date of manufacture must be recorded on the antenatal card. Dosages are recommended by EPI Programme. BCG should be given to all babies.

Non-healing ulcers after vaccination with BCG (up to 8 weeks) or regional lymphadenopathy can be treated with:

- Isoniazid, oral, 5 mg/kg body weight daily for 6 months and needle aspiration in case of an abscess.

**Case Management:**

**Diagnosis**

Smear microscopy remains the most important diagnostic tool. Histopathology and radiography are also helpful, particularly in those patients who do not produce sputum.

**Sputum**

Each patient should have direct smear microscopy (DSM) on 3 sputum specimens for diagnosis. DSM should be repeated at the end of the intensive phase to confirm sputum conversion.

Sputum of TB patients MUST be sent or taken to the TB Reference Laboratory when:

Sputum conversion to negative has not taken place
There is concern that the patient has developed drug resistance. Culture and sensitivities are required.

**Chest X-rays**
This has to be done upon:
- Admission for diagnosis
- Completion of outpatient treatment

**Note** To reduce the rate of exposure of the patients, any other films can be taken only where specifically indicated. An X-ray at the end of the intensive phase is not likely to provide any additional benefit.

The diagnosis of TB in children can be very difficult owing to the wide range of symptoms. Sputum cannot often be obtained from children and in any case it is often negative even on culture. Symptoms in children are not typical. The diagnosis should therefore be based on clinical findings, family history of contact with a smear positive case, X-ray examination and tuberculin testing, culture (if available) and non-response to broad spectrum antibiotic treatment. A score chart below can help to reach the diagnosis of tuberculosis. Older children who are able to cough up sputum should go through the same assessment as adults using smear microscopy as the “gold standard”.
Score Chart for the Diagnosis of Tuberculosis in Children

<table>
<thead>
<tr>
<th>GENERAL FEATURES</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to thrive or weight loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculin test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic infant disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOCAL FEATURES</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest x-ray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lymph nodes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swelling of bone or joint</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A score of **9 or more** indicates a high likelihood of tuberculosis.
**Tuberculin Testing**

The tuberculosis skin test is valuable as a diagnostic tool in young children. In a child who did not receive a BCG vaccine an induration of 10mm or more is interpreted as positive. If the child did receive a BCG, the induration should be at least 15mm to be positive.

**A positive result may indicate:**
- Active infection (especially when strongly positive)
- Previous infection or
- Previous BCG

**Note:** Absence of a response does not exclude TB because individuals with HIV may not have sufficient immunity for a positive Mantoux Test despite active TB

**Treatment Categories**

TB patients are grouped in four main categories,

<table>
<thead>
<tr>
<th>Category</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>New sputum smear positive Pulmonary TB (positive pulmonary TB) and severe Extra Pulmonary TB</td>
</tr>
<tr>
<td>II</td>
<td>Relapse, Treatment failure and sputum smear positive return after default</td>
</tr>
<tr>
<td>III</td>
<td>New sputum smear negative and Extra Pulmonary TB (less severe forms)</td>
</tr>
<tr>
<td>IV</td>
<td>Chronic cases</td>
</tr>
</tbody>
</table>
Category I and III treatment regimens according to the dose and body weight.

<table>
<thead>
<tr>
<th>Duration of treatment</th>
<th>DRUG</th>
<th>CHILD Pre-treatment weight</th>
<th>ADULT Pre-treatment weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5-10kg</td>
<td>11-20kg</td>
</tr>
<tr>
<td>2 months, intensive phase, daily</td>
<td>(RHZE)</td>
<td>½ tablet</td>
<td>1</td>
</tr>
<tr>
<td>observed</td>
<td>150/75/400/275mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Months continuation phase, daily</td>
<td>(RH)</td>
<td>½ tablet</td>
<td>1</td>
</tr>
<tr>
<td>observed</td>
<td>150/75mg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**R** = Rifampicin  
**H** = Isoniazid  
**Z** = Pyrazinamide  
**E** = Ethambutol

Maximum recommended daily dosage of Rifampicin in FDC 750 mg
The numbers indicate number of tablets to be taken daily for treatment according to body weight and content of tablets.
These recommendations are based upon dosages by body weight: Rifampicin 10mg/kg; Isoniazid 5mg/kg; Pyrazinamide 25 mg/kg; Ethambutol 25 mg/kg; If Ethambutol is given for any reason for more than 8 weeks, the daily dose must be reduced to 15 mg/kg body weight.

**Some important notes**
- The oral drugs should preferably be given early morning after small meal (avoid fat) in a single dose.
- The oral drugs must be swallowed under supervision of a health facility worker or at home under supervision of treatment supporter.
Category II treatment regimens according to the dose and body weight.

<table>
<thead>
<tr>
<th>Duration of treatment</th>
<th>DRUG</th>
<th>CHILD Pre-treatment weight</th>
<th>ADULTS Pre-treatment weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 months intensive phase, daily supplied and observed treatment</td>
<td>S (i.m)</td>
<td>5-10 kg</td>
<td>11-20 kg</td>
</tr>
<tr>
<td>(RHZE) 150/75/400/275 mg</td>
<td>15mg/kg</td>
<td>15mg/kg</td>
<td>500mg</td>
</tr>
<tr>
<td></td>
<td>½ tablet</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1 month intensive phase, daily supplied and observed treatment</td>
<td>(RHZE) 150/75/400/275 mg</td>
<td>½ tablet</td>
<td>1</td>
</tr>
<tr>
<td>5 Months continuation phase, 3 weekly observation</td>
<td>(RH) 150/150 mg</td>
<td>½ tablet</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>E 400mg</td>
<td>1/4 tablet</td>
<td>½ tablet</td>
</tr>
</tbody>
</table>

**Note:**
- **R**-Rifampicin, **H**-Isoniazid, **Z**-Pyrazinamide, **E**-Ethambutol
- Total duration of treatment for category I and III patients is 6 months
- Total duration of treatment for category II patients is 8 months
- Direct Observation of Treatment (DOT) should be done daily for entire duration of treatment
- Patients older than 50 years of age should not exceed a dosage of 750mg streptomycin
- Streptomycin should not be given to pregnant women
* Patients older than 50 years of age should not exceed a dose of 750 mg Streptomycin. Streptomycin should not be given to pregnant women
** Notice the higher dose-formulation of RH and increase in dosage of Ethambutol in the three weekly regimen

**Note:**
- If Ethambutol is to be given for more than 8 weeks reduce to 15 mg/kg body weight
- Ethambutol should not be given to children

**Treatment guidelines Category III; 2 {RHZE}/4{RH}**
Duration of treatment: 6 months
DOT: Daily for full duration of treatment

**Treatment guidelines Category IV; Chronic patients**
No regimen available yet in Zanzibar

These are patients who remain or become sputum smear positive after completing fully supervised retreatment regimen. It is important to identify TB patients with Multi Drug Resistant (MDR) TB among chronic patients. Not every TB chronic patient is MDR-TB case. Many of these patients, although persistently smear positive, may still be partially or fully sensitive to the common anti-TB drugs. A “chronic” TB patient with unknown susceptibility pattern should always first submit sputum samples for drug susceptibility testing (DST) to the central TB reference laboratory before any further actions taken.

**Treatment in special cases**

**Pregnancy** - Always ask woman if is pregnant before commencing treatment. Most anti-TB drugs are safe during pregnancies except streptomycin, which causes permanent deafness in the foetus therefore it should be avoided during pregnancy.

**Breastfeeding** - Full TB treatment is safe and is the best way to prevent tuberculosis in the baby. Mother and child can stay together for the entire duration of treatment. In mothers with pulmonary tuberculosis, the baby should receive INH preventive treatment (5mg/kg) for 6 months followed by BCG vaccination.
**Oral contraceptives** - Rifampicin interact with oral contraceptives and reduce the efficacy of the contraception. Women using oral contraceptives should be advised to use pills with a higher dose of oestrogen (50mcg) or change to another method.

**Liver disease** - Most anti-TB drugs can cause liver damage. In case a patient develops jaundice, treatment should be stopped and restarted as soon as the jaundice resolves. In severely ill patients start streptomycin and ethambutol only. If the patient improves follow with a gradual step-up introduction of Isoniazid followed by Rifampicin until full dose. Monitor liver functions and clinical picture. If the condition deteriorates stop the drug which was last added. Patients with established chronic liver-disease should not receive Pyrazinamide. The treatment given is **2 RHE/6EH** for Category I and III patients and **2 SRHE/6RHE** for Category II patients.

**Renal failure** - Isoniazid, Rifampicin and Pyrazinamide are almost entirely excreted by the liver and therefore safe to use. Streptomycin and Ethambutol are excreted by the kidneys and should either be avoided or given in a reduced dose. The safest regimen for patients with renal failure is **2 RHZ/4 RH** combined with pyridoxine to prevent Isoniazide induced peripheral neuropathy.

**HIV** - There is a danger of interaction between Rifampicin and protease inhibitors in HIV positive patients receiving antiretroviral (ARV) treatments. Rifampicin stimulates the activity of the liver enzyme system, which metabolises protease inhibitors (PI) and Nucleoside Reverse Transcriptase Inhibitors (NsRTIs). This can lead to decreased blood levels of PIs and NsRTIs. Of the NsRTIs the concentration of Nevirapine is significant reduced and hence Nevirapine and Rifampicin should not be used concomintantly. On other hand PIs enhance the liver enzyme system which influences the blood levels of rifampicin resulting in ineffective TB treatment or drug toxicity. NsRTIs can cause peripheral neuropathy, which can result in an added toxicity caused by Isoniazid.

**The role of adjuvant steroid therapy**
Steroid therapy given in additional to anti-TB treatment is beneficial in tuberculosis meningitis, pleural TB with large effusion and TB pericarditis.
The recommended dosage in TB meningitis and TB pericarditis is 40-60mg/daily for 1 – 4 weeks, gradually decreasing the dosage over several weeks.
Other less frequent conditions, which can benefit from steroid treatment, are:

- TB laryngitis with airway obstruction
- Massive lymphadenopathy with signs of obstruction of e.g airway
- TB of renal tract to prevent uretic scarring
- Tb of adrenal glands causing hypo-adrenalism
- Severe hypersensitivity reaction to anti-TB drugs

Although steroids are immunosuppressant they can be used in HIV positive patients as the overall benefit of steroids, in the context of above conditions, outweighs the risk of other opportunistic infections.

3.9.2 Leprosy

Description/clinical features:

It is a chronic granulomatous disease caused by *Mycobacterium leprae*. An acid /alcohol fast bacillus that has a very slow multiplication.

Leprosy is the commonest cause of peripheral neuritis in the world. The major clinical features therefore include hypopigmented skin patch with loss of sensitazation (anaesthetic), some times the patches can be macular, nodular or erythematous and thickening of peripheral nerves

General Information about Leprosy

It mainly affects peripheral nerves the skin, and mucous membranes. It is a disease mainly of human beings, which affects people of all races, all ages and both sexes.

Patients harbouring many bacilli in their bodies are called the **multibacillary** patients, they are the main sources of infection. If not treated, they spread the disease in the community and infect others through coughing and sneezing (droplet infection). These infectious patients represent only about 25% of the registered leprosy patients in Tanzania. The other 75% of patients with few leprosy bacilli, the **paucibacillary** patients are less infectious. Leprosy can not be transmitted by skin contact with leprosy patients.

The different manifestations of leprosy are due to differences in the degree of resistance (immunity) of the human body and not due to different kinds of bacilli.

The majority of people (about 85%) have a strong resistance to M. Leprae that even when infected they do not develop the disease. They are immune. About 75% of children who get infected with leprosy
bacilli have such a high resistance that they overcome the disease themselves, without treatment, at very early stage. People who have a fairly high but incomplete immunity to leprosy bacilli will develop **paucibacillary** leprosy.

There are only very few people in the community (5-10%) whose immunity to *M. Leprae* is naturally very low. When somebody from this group of people is infected by *M. Leprae*, the bacilli may multiply freely and attain large numbers causing **multibacillary** leprosy.

**When Leprosy should be suspected**

Patients should be suspected of having leprosy when they show one or more of the following signs or symptoms:
- One or more pale or reddish, hypo-pigmented patch(es) on the skin with or without loss of sensation
- Painless swellings or lumps in the face and/or earlobes
- Enlarged and/or tender nerves
- Burning sensations in the skin
- Numbness or tingling of the feet and/or hands
- Weakness of eyelids, hands and/or feet
- Painless wounds or burns on the hands and/or feet

Such patients need to be examined by trained health worker.

**Diagnosis of Leprosy**

The diagnosis of leprosy must be based on the history of the symptoms and careful clinical examination of the person for signs of leprosy. Only in rare instances a laboratory and other investigation may be needed to confirm the diagnosis of leprosy. If one is not sure of diagnosis, the suspect should be seen by the the District TB and Leprosy coordinator or other personnel trained in leprosy.

The diagnosis depends on three cardinal signs:
1. Skin patch with loss of sensation
2. Enlargement of peripheral nerves
3. Positive skin biopsy for *M. Leprae*

**History taking**

Detail proper history taking is very important for understanding the patient’s situation and for tracing a lost patient. The following must be obtained:
- General information: all three names, sex, year of birth, occupation, full address including the name of village/street leader and distance from home to clinic.
Main complaints, including date of onset, site of first lesions, subsequent changes and development of the disease, previous treatment received. Information regarding other leprosy cases in patient’s household.

**Physical examination**

Physical examination should always be carried out with adequate light available and with enough privacy for the person to feel at ease.

The patient is asked to undress. To ensure that no important sign is missed, a patient must be examined systematically. A well tried system is to examine the patient as follows:

- Start with examination of the skin, first head, then neck, shoulders, arms, trunk, buttocks and legs.
- Look for any discoloration of the skin, thickening or swelling.
- Then palpation of the nerves; starting with the head and gradually going to the feet
- Then the examination of other organs
- Examination of the skin smear
- Finally the examination of eyes, hands and feet for disabilities.

**Complications due to nerve damage**

- Injury to cornea and loss of vision due to incomplete blink and/or eye closure
- Skin cracks and wounds on palms and sole with sensation loss
- Clawed fingers and toes
- Drop foot
- Wrist drop
- Shortening and scarring fingers and toes with sensation loss. Mark and draw also wounds, clawing and absorption levels on the maps using the appropriate marks.

All deformity observed among Leprosy patient is due to NERVE DAMAGE. This may occur before the patient put on treatment for Leprosy or during treatment or after treatment. Therefore it is essential important to undertake checking to all the following complications which result from nerve damage in three month interval during the time of collection of drugs voluntary muscular test (VMT) and record appropriately, VMT should continue for at least two years after patient completed treatment. Patient should be fully informed of the possible complications and equipped with knowledge on preventive measures for all complications but should report back to Health Facility for any observed complication for support and treatment.
A diagnosis of leprosy should be made if ONE among the following CARDINAL SIGNS is presents
• Skin patch with loss of sensation
• Enlarged of peripheral nerves
• A skin smear positive for M.leprae / Biopsy

**Classification of Leprosy**
The main purpose of classification is to decide on the treatment regimen to be given to the patient.

Leprosy is classified into two groups depending on the number of accounted skin patche on the body. Patients considered to harbour many bacilli belong to the multibacillary (MB) group; patient have accounted more then five patches ; those with few bacilli form the paucibacillary (PB) group, patient have accounted one to five patches.

Classification is also important as it may indicate the degree of infectiousness and the possible problems of leprosy reactions and further complications.
There are two methods of classifying leprosy, based on:
• The number of leprosy skin patches.
• The presence of bacilli in the skin smear
Skin smear are recommended for all new doubtful leprosy suspects and relapse or return to control cases.

**Classify patients as follows:**
1. Multibacillary (MB) leprosy
   • Patients with six or more leprosy skin patches

2. Paucibacillary (PB) leprosy
   • Patients with one to five leprosy skin patches.

If there is any doubt regarding the classification, the patient should be classified and treated as a multibacillary case. This certainly applies to patients who have been treated in the past and of whom information is insufficient on the treatment previously used.

**Drug Treatment:**
Multiple drug treatment (MDT) is recommended treatment for leprosy. MDT is the combination of a minimum of two ant-leprosy drugs.. Treatment of leprosy with only one drug (mono-therapy) will result in development of drug–resistance, therefore it should be avoided. Patients
having multibacillary leprosy are given a combination of Rifampicin, Dapsone and Clofazimine while those having paucibacillary leprosy are given a combination of Rifampicin and Dapsone. Both regimens are given in the form of a blister pack on a four weekly basis. A patient takes a first dose under direct observation of a health worker. For the following 27 days, the patient then takes the medicine unsupervised.

**Dosage (Adult MB)**

Monthly Treatment:
Day 1
Rifampicin 600mg (2 x 300mg)
Clofazemin 300mg (3 x 100mg)
Dapsone 100mg

Daily Treatment: Days 2 – 28
Clofazemine 50mg
Dapsone 100mg

**Duration of treatment**
12 blister packs to be taken within a period of between 12-18 months

**Dosage (Child MB 10 – 14 years)**

Monthly Treatment: Day 1
Rifampicin 450mg (3 x 150mg)
Clofazemin 150mg (3 x 50mg)
Dapsone 50mg

Daily Treatment: Days 2 – 28
Clofazemine 50mg every other day
Dapsone 50mg daily

**Duration of treatment**
12 blister packs to be taken within a period of between 12-18 months

**Dosage (Adult PB)**

Monthly Treatment: Day 1
Rifampicin 600mg (2 x 300mg)
Dapsone 100mg

Daily Treatment: Days 2 – 28
Dapsone 100mg
Duration of treatment
6 blister packs to be taken within a period of between 6-9 months

Dosage (Child PB 10 – 14 years)
Monthly Treatment: Day 1
Rifampicin 450mg (3 x 150mg)
Dapsone 50mg
Daily Treatment: Days 2 – 28
Dapsone 50mg daily

Duration of treatment
6 blister packs to be taken within a period of between 6-9 months

Duration of MDT
Paucibacillary leprosy
• Patients should receive 6 doses to be taken within a maximum period of nine months. When collecting the 6th dose the patient should be released from treatment (treatment completed)
• Every effort should be made to enable patients to complete chemotherapy. A patient whose treatment is cumulatively interrupted for more than three ‘months’ or patient who has missed three doses of MDT in a total and hence cannot complete the 6 doses within 9 months, should be recommended as defaulter
• If a defaulter returns later to the clinic, s/he should be given ONE- second course of respective antileprosy MDT.

Multbacillary leprosy
• MB patients should receive 12 doses to be completed within a maximum period of 18 months. When collecting the 12th dose of MDT the patient should be released from treatment (treatment completed)
• Patient who fail to collect the 12 doses of MDT within 18 months should given ONE second chance to complete a full course of Blister Pack. The procedures for a second course for MB

Blister Pack as follows:-
- A patient whose treatment is cumulatively interrupted for more than six ‘months’ or A patient who has missed 8 doses of MDT in total and hence cannot complete the 12 doses within 18 months, should be recorded as defaulter.
- When a defaulter report at a clinic, a second course of MDT should be started after the importance of regular treatment has been discussed with the patient. Patients who restart the treatment must be
registered into the unit register District Leprosy Register again with a new number as return after default and thus should be included in another treatment cohort for assessing completion of treatment.

- Every effort should be made to ensure that patients complete the second course of MDT as recommended.
- After completion of the second course of MDT the patient should be recorded as treatment completed.

A patient who fails to complete the second course should be regarded again as a defaulter

**Treatment in special cases**

**Pregnancy:** The standard MDT regimens are considered safe, both for mother and child and should therefore be continued during pregnancy.

**Tuberculosis:** Patients suffering from both tuberculosis and leprosy require appropriate antituberculosis therapy in addition to the MDT. Rifampicin must be given in the dose required for the treatment of tuberculosis. Once the intensive phase of anti TB treatment is completed, the patient should continue with his/her monthly rifampicin for leprosy treatment.

**HIV:** The management of a leprosy patient infected with HIV is the same as that for any other patient. The response and cure rate of HIV positive patient is the same as in other patients. The management, including treatment reactions, does not require any modifications.

**Leprosy reactions and relapse**

Leprosy reaction is sudden appearance of acute inflammation in the lesions (skin patches, nerves, other organs) of a patient with leprosy. This is due to an alteration in the immunological status of the patient.

**Reactions are the major cause of nerve damage and disability in leprosy.** Therefore should be detected early and treated.

Leprosy reactions are of natural cause of the disease and can occur at any time. Reaction commonly occurs during the early stage of disease. Sometimes patients report for first time to a health facility because of leprosy reaction. Some reactions are seen after completion of the treatment.
There are two types of reactions
Reverse Reaction (RR) or type I reaction
Erythema Nodosum Leprosum (ENL) or type II reaction (For detail refer Manual for management of Leprosy for Health Workers)

**Treatment of Reversal Reaction Or Type I Reaction**
Depending on severity, treatment of RR is by giving anti-inflammatory drugs or corticosteroids usually prednisolone for a prolonged period.

**Standard treatment of Severe RR with Prednisolone**

<table>
<thead>
<tr>
<th>Treatment Plan</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mg daily (8 tablet of 5mg or 1 tablet of 40mg Prednic pack)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>30 mg daily (6 tablet of 5mg or 1 tablet of 30 mg Prednic pack)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>20 mg daily (4 tablet of 5mg or 1 tablet of 20mg Prednic pack)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>15 mg daily (3 tablet of 5mg or 1 15mg Prednic pack)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>10 mg daily (2 tablet of 5mg or 1 tablet of 5mg Prednic pack)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>5mg daily (1 tablet of 5 mg or 1 tablet of 5mg Prednic pack)</td>
<td>2 weeks</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12 weeks</td>
</tr>
</tbody>
</table>

**Continue MDT during treatment of reversal reaction**
Treatment of severe RR with Prednisolone at Hospital level

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 mg daily (12 tablet of 5mg Prednisolone)</td>
<td>1 week</td>
</tr>
<tr>
<td>50 mg daily (10 tablet of 5mg Prednisolone)</td>
<td>1 week</td>
</tr>
<tr>
<td>40 mg daily (8 tablet of 5mg Prednisolone )</td>
<td>2 weeks</td>
</tr>
<tr>
<td>30 mg daily (6 tablet of 5mg Prednisolone)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>20 mg daily (4 tablet of 5mg Prednisolone)</td>
<td>10 weeks</td>
</tr>
<tr>
<td>15 mg daily (2 tablets of 5mg Prednisolone)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>10 mg daily (2 tablets of 5 mg Prednisolone)</td>
<td>2 weeks</td>
</tr>
<tr>
<td>5 mg daily (1 tablets of 5 mg Prednisolone)</td>
<td>2 weeks</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22 weeks</strong></td>
</tr>
</tbody>
</table>

Continue with MDT during treatment of reversal reaction

**Note:** Identification and Treatment for reaction should be within six months of the onset of reaction, otherwise nerve damage will continue despite of treatment.

**Note:** Before you give the patient prednizolone it is essential to prescribe broad ant- Helmenthic to deworm especially strongiloids who may cause over migration from intra intestinal to different tissue and organs.

Treatment for Erythema Nodosum Leprosum (ENL) or Type II reaction

Erythema Nodosum Leprosum occurs only in multibacillary leprosy patients. An estimated 5 to 10% of MB patients develop ENL reaction. It is caused by an interaction between dead *M. leprae* and substances accumulating in the blood and tissues. The reaction is often triggered by special circumstances like emotional stress, pregnancy or childbirth, infectious diseases (malaria TB), etc
Treatment of ENL

**Mild ENL:** Advice the patient to rest and provide analgesics such as aspirin (600mg three times a day) and chloroquine if available (150 mg two times daily), for one week duration. Re-examine the patient for signs of new nerve damage at weekly intervals. If no improvement after six weeks with analgesics or signs of a more severe ENL reaction occur, use prednisolone.

Severe ENL: Refer the patient to the nearest hospital for appropriate examinations and treatment.

Prednisolone is given for three weeks as per schedule shown below.

**The standard treatment schedule of severe ENL at Hospital level**

<table>
<thead>
<tr>
<th>Daily dose prednisolone (mg)</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weeks</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>1st Week</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>2nd Week</td>
<td>40</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>3rd Week</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Recurrent ENL**

A few patients get regular episodes of ENL as soon as the dose of prednisolone comes below 20 or 15mg per day. This is called chronic or recurrent ENL. Patients with recurrent ENL should be referred to hospital.
4.0 ORAL DISEASE CONDITION

Oral disease/condition can affect:
1. Hard tissues (Teeth and Bones)
2. Soft tissues (Mucous membrane and muscles)

4.1 Oral Thrush

Description/Clinical features
It is oral infection which is caused by candida albicans characterized by white patches on the tongue and mucous membrane of the buccal cavity. Mostly they appeared to the patients with low immunity.

Drug treatment:
First choice:
• Apply 0.5% Gentian violent twice daily for 10 days on the mucous membrane by using a small piece of cotton wool.
• Nystatin oral suspension, 100,000 IU
Adults: apply as a gargle
Children: as oral suspension, 8 hourly for 14 days

Second choice:
4% sodium bicarbonate solution apply twice daily in the mouth using a small piece of cotton wool.

Advice:
• Feed the child soft, cool foods.
• Give small amount of food often.

Follow up
• After one week the mouth should be clean.
**Prevention:**
- Breast-feed infant or use a cup and spoon.
- Avoid bottles for children.
- Do not use antibiotic unnecessarily.
- For long term antibiotic use (more than fourteen days) Nystatin tabs for prophylaxis of fungal infection.

**Referral criteria:**
Persistent thrush despite of proper and adequate treatment.
* Suspect infection in adults and children

### 4.2 Apthous Ulcers

**Description/clinical features:**
These are painful recurrent mucous membrane ulcerations. Usually affect the non keratinized oral mucous membranes. They are divided into two groups, namely: minor Apthous ulcers and major apthous ulcers.

#### 4.2.1 Minor Aphthous Ulcers
Painful ulcers on non-keratinized oral mucous membranes; there are one to five small 5mm round or oval shallow ulcers, recur frequently, often cyclically, heal spontaneously in less than 3 weeks.

**Non drug treatment:**
Take care of oral hygiene, avoid acidic and irritant foods.

**Drug treatment:**
5% Chlorhexidine or Povidone iodine mouth washes, Paracetamol 1g, oral, when necessary.

#### 4.2.2 Major Aphthous ulcers
Painful ulcers on non-keratinized oral mucous membrane, they are large 1-3 cm edged ulcers, and several may be present simultaneously. There is marked tissue destruction which is sometimes constantly present. Healing is prolonged often with scarring.

**Non drug treatment:**
Cryosurgery occasionally, to relieve pain and promote healing

**Drug treatment:**
Chlorhexidine 0.1% or Povidone iodine mouth wash, Topical or systemic steroids i.e Prednisolone, oral, 2mg/kg in three divided doses
Paracetamol 1g, oral, 8 hourly for 3 days  
**Plus**  
Amoxacillin 500mg, oral, 8 hourly for 5 days.

**Advice:**  
• Rinse mouth with warm salty water before sleeping.  
• Tooth brushing using loop warm saline and rinse with 3% Hydrogen Peroxide.  

**Prevention:**  
• Good oral hygiene.

**Referral criteria:**  
Refer to the dental clinic, if the condition does not improve after a week.

### 4.3 Stomatitis  
**Description/clinical features:**  
Is the inflammation of mucous membrane of the oral cavity. This can be caused by many factors, e.g. drugs, low immunity; high fever especially to the children.

**Vincent’s stomatitis** is the type of stomatitis which mostly affects children under five years with malnutrition and poor oral hygiene. The child presents with a swelling of gums which easily bleeds and unpleasant smell from the mouth.

**Angular stomatitis** is the type of stomatitis which affects angles of the mouth. It is caused by vitamin B deficiency.

Infected stomatitis is the type of stomatitis which affects mucous membrane. It is caused by drugs, poor oral hygiene, low immunity, high fever, etc.

**Non drug treatment:**  
Oral hygiene – clean affected area with Normal saline

**Drug treatment:**  
• Vincent’s stomatitis:  
Amoxycilline suspension 125mg, 8 hourly for 5 days,  
**Or**  
Ampicloox suspension 250mg, 8 hourly for 5 days
**Plus**
3% Hydrogen peroxide, mouth washes.

Angular stomatitis:
Vitamin B complex, oral, one tablet, 8 hourly for 1 month.

- Infected stomatitis:
  Amoxycillin 500mg, oral, 8 hourly for 5 days
- Or
  Ampiclox 500mg, oral, 8 hourly for 5 days
**Plus**
Metronidazole 400mg, oral, 8 hourly for 5 days
**Plus**
3% Hydrogen peroxide mouth washes.

**Advice:**
- Maintain oral hygiene
- Improve nutritional status

**Prevention:**
- Eating a well balanced diet that contain Vitamin B and Iron

**Referral Criteria:**
- If condition does not clear up within 10 days
- Very severe cases should be referred to Dental clinic.

4.4 **Dental Caries**

**Description/clinical features:**
A condition where by the tooth is demineralized by acid which is produced by bacteria on metabolizing sugar. Demineralization starts slowly with white spots on the tooth surface and later developing cavities on the enamel, dentine and later inflammation of the pulp.

**Actiology –** It is multi factorial. These involve four factors:
1. Carbohydrate foods: particularly refined carbohydrate. e.g. sucrose
2. Micro organisms: e.g Streptococci, lactobacillus acidophilus etc
3. Host (Tooth)
4. Time.
**Note:**
Absence of one of these – Process won’t take place. When these factors are present acid is formed and this leads to loss of inorganic tooth substance of enamel, white sports are formed on the enamel.

**Non drug treatment:**
Oral hygiene

**Drug treatment:**
Encourage dental fillings
For complicated deep caries:
Tooth Extraction
For pulpitis:
Erythromycin 500mg, oral, 8 hourly for 7 days
Or
Amoxycillin 500mg oral, 8 hourly for 5 days
Or
Ampiclox 500mg oral, 8 hourly for 5 days
**Plus**
Paracetamol 1g, oral, 4–6 hourly

**Prevention:**
- Avoid using sugar food and drinks.
- Brush teeth or rinse the mouth after meal.
- Visit dentist (for prophylaxis measure).
- Fluoridation of the drinking water

**Referral Criteria:**
Refer for further management if dental services are not available

4.5 **Tooth extraction**

**Description/clinical features:**
Removal of a tooth from its socket in the bone

**Indication:**
1. Beyond repair RCT tooth (unsuccessful treatment)
2. Supernumerary tooth.
3. Pulpitis
4. Periodontal diseases (Mobility 3º)
5. Traumatic injury of the Root.
6. Tooth along line of fracture.
7. Orthodontic requirement
8. Malposition
9. Impaction
**Note:**
Tooth extraction can not be performed in the following patient: - Cardio-vascular Diseases such as Myocardial infection glomerulonephritis Blood disorder e.g. Haemophilic patient;

4.6 Complications of tooth extraction

*Description/Clinical features:*
1. Socket bleeding
2. Swelling
3. Infected socket

**Cause:**
- Use of unsterilized instruments.
- Poor oral hygiene.
- Failure to follow post extraction instructions

**4. Dry socket:** complication happens due to failure of blood cloting to the socket following tooth extraction.
If the condition is not treated it leads to osteomyelitis.

**Drug treatment:**
- Inject the area with local anaesthetics, 2% Lidnocaine
- Clean the area with 3% Hydrogen peroxide; stimulate fresh bleeding or new blood clot formation.
- Amoxacillin 500g, oral, 8 hourly for 5 days
**Or**
- Ampiclox 500mg, oral, 8 hourly for five days
**Plus**
- Metronidazole 400, oral, 8 hourly for 5 days
**Plus**
- Paracetamol 1g, oral, 4 –6 hourly

4.7 Dental Abscess

*Description/Clinical features:*
This is an acute, painful infection of the soft tissues.
Can be due to untreated caries lesions or untreated periodontal abscess.

**Drug treatment:**
- Incision and drainage
- Irrigation with 3% Hydrogen peroxide and Eusol.
Erythromycin 500mg, oral, 8 hourly for 7 days
Or
Ampiclox 500mg, oral, 8 hourly for 5 days.
Plus
Metronidazole 400mg, oral, 8 hourly for 5 days
Plus
Paracetamol 1g, oral, 4–6 hourly
Mouth gaggle, 3% Hydrogen peroxide or Potassium permanganate.

Referral criteria:
If the services is not available

4.8 Ludwig's Angina
Descripcion/ Clinical features:
This is the most serious complication following severe dental caries or periodontal diseases especially on tooth number 36-38 or 46-48. The infection goes from submandibular space to submental and to the floor of the mouth.
Severe swelling at submandibular, submental, to the floor of the mouth, tongue elevation and Patient can suffocate due to blockage of the tongue on the airway.
Referral needed urgent.

Treatment:
Incision and drainage with Irrigation;
Ensure clear air way;
Metronidazole 500mg, I.V, 8 hourly for 5 days

Plus
Benzyl Penicillin 2.4g – 4.8g, I.V, 6 hourly for 24 – 48 hours

If allergic to penicillin use Ceftriaxone injection, 1g, I.V, 8 hourly for 5 days
Plus
Dextrose with Normal Saline (DNS) 1000ml for 24 hours
Plus
Diclofenac injection, 75mg, 8 hourly for 3 days

If the condition is not serious:
Erythromycin 500mg, 8 hourly for 7 days
Or
Gentamicin 80mg, I.V, 12 hourly for 5 days
Or
Ampiclox 500mg, oral, 8 hourly for 5 days
Plus
Metronidazole 400mg, oral, 8 hourly for 5 days

**Referral Criteria:**
Refer urgent to higher facility if services are not available

4.9 Bleeding socket
**Description/clinical features:**
This is the most common complication of tooth extraction. The complication can be caused by either the patient him/her self or doctor e.g. if patient didn’t follow the instructions carefully. Though at times may be due to bonny/tooth remnants.

The prescriber must take the history from the patient carefully e.g. (ask the patient bleeding tendency to rule out blood disorder disease such as haemophilia.

**Drug treatment:**
- Clean the socket with 3% Hydrogen peroxide.
- Clean socket and then pack cotton with Adrenaline for sometime.
**Or**
- Pack cotton with Zinc oxide emulsions.
- Administer Injection Vitamin K, 5 – 10mg, I.M
- Suturing if necessary.

**Advice:**
Do not rinse the mouth with hot water following tooth extraction

**Referral Criteria:**
Refer the case for further investigation (for bleeding disorders) and management.

4.10 Tumours of the Oral Cavity
Can be traced to originate from tissues of the tooth germ (odontogenic epithelia, odontogenic connective tissue).

These tumours can be divided into benign and malignant tumours.

(a) Benign Odontogenic Tumours
Ameloblastoma, Calcifying Odontogenic Tumour, Ameloblastic fibroma, Adematoi Tumour (Adeno Ameloblastoma), Calcifying Odontogenic Tumour, Ameloblastic Fibro-Odontoma, Odonto Ameloblastoma, Complex Odontoma, Compound Odontoma,
Odontogenic Fibroma, Odontogenic myxoma, Cementoma and Cementifying Fibroma.

_Treatment guidelines:_
Can be mandibulectomy, Hemimandibulectomy, Nucleation, Maxillectomy, and Hemimaxillectomy

**(b) Malignant Odontogenic tumours**
Odontogenic Carcinomas and Odontogenic Sarcomas

_Treatment guidelines:_
If no metastasis:
Surgical excision and antibiotics
If there is metastasis:
Palliative treatment

4.11 Soft Tissue and Bone Tumours (Non-Odontogenic)
These are also divided into two groups;

**(a) Benign tumours**
Papilloma, Heratoacanthome, Fibroma, Fibrous Epulis, Peripheral Giant Cells, Pregnancy Tumour, Hemangioma, Lymphangioma, Lipoma and Pigmented nerves

_Treatment guidelines:_
Surgical excision and antibiotics

For Haemangioma – Use sclerosing agent first until the tumour calcified then you can carry out surgical excision.
Benign osteogenic tumours (arise from bone) Osteomas, Myxomas, Chondromas, Ewing’s tumour, Central giant cell and Fibro-osteoma.

_Treatment guidelines:_
Surgical excision

**(b) Malignant soft and bone tumours**
Squamous cell carcinoma, Sarcoma, Lymphosarcoma, Myosarcoma, Chondrosarcoma, Fibrosarcoma, Adenosarcoma, Adenocystic carcinoma and Epidermoid carcinoma.

_Treatment guidelines:_
Palliative – but this depends on stage of the tumour: stage I and II surgical excision (squamous Cell carcinoma) with wide margin then curative radiotherapy. Others, surgical excision, radiotherapy followed by chemotherapy, if lesion is not advanced or in stage I and II.
4.12 Burkitt’s lymphoma (African jaw tumour)
**Description/clinical features:**
Burkitt’s tumour is an undifferentiated lymphoblast lymphoma. It shows close association with Infection with the Epstein Barr virus.
Group risk -young children to 14 years Common areas- Northeast in Pemba and Unguja.
The clinical picture varies with age of the patient, the typical jaw tumor being the Commonest in the younger patient.

**Treatment guidelines:**
- Early detection and referral
- Curative treatment comprises of combination chemotherapy
- Palliation with cyclophosphamide is of good but temporary benefit.
- These should be treated after a definitive histopathological report.

**Refer Criteria:**
All tumours of oral cavity - No need of first aid.
But for malignant cases- referral and first aid is needed - Inj Diclofenac 75mg stat.

4.13 Traumatic Injuries in children and adult

**Description/clinical features:**
Dental trauma may result in loosening, displacement and or loss of teeth, fracture of teeth and or bone, lacerations and bleeding. The commonest causes are alls (in sports and play) at home or school and motor accidents. Most affected are teeth upper incisors.

**Management**
Take x-ray picture of affected tooth/teeth

**Non drug treatment:**
- Removal of fracture elements in excessive mobility degree (surgical toilet).
- Strict oral hygiene in cases of loosening and mobility.
- Use hydrogen peroxide, normal saline, tooth brush.
- Immobilization of affected tooth/teeth with arch bar, ss wires, acrylic splints, sutures.
- Restoration of aesthetics (composite filling, prosthesis).
- **Extraction** is treatment of choice for traumatized primary teeth with mobility and or displacement.
**Drug treatment:**
- Tetanus immunoglobulin human, 3 000 units, I.M, as a single dose

*Or*
- Tetanus toxoid vaccine, I.M, 0.5 ml, total of 3 doses:
  - On admission at 4 weeks and at 6 months
- Ampiclox 500mg, oral, 8 hourly for 5 days.
- Diclofenac oral, 50mg, 8 hourly

**Referral Criteria:**
Referral for maxillofacial management in case of extensive damage to maxillofacial structures.
CHAPTER 5

5.0 PSYCHIATRIC DISORDERS

These are problems in which feelings and behaviour are the major factors in diagnostic procedures.

The two main diagnostic categories are:

1. Neuroses
2. Psychoses (functional and organic)

Some specific disorders are found only in children and these may include developmental disorders like autism.

5.1 Neurosis
These are conditions in which anxiety; depression or both are the leading features.
Individuals who suffer from these types of disorders are normally in touch with reality and to a large extent are in charge of their general behaviors. In most cases the patient may be reacting to a stress, known or not necessarily obvious to him.

5.1.1 Anxiety
Description/clinical feature:
In anxiety, presenting symptoms may be feeling fearful, sleep disturbance, sweating, palpitating, hyperventilating or other somatic symptoms. Nothing abnormal may be found on physical examination, though the possibility of co-morbidity with an established physical illness is quite possible.
Non drug treatment:
• Try to see if patient is reacting to any specific stress. Discuss this realistically and give moral support. You may need to talk with a close relative.

Drug treatment:
• Medicines are usually not required in most cases, but when symptoms are severe:
  Diazepam 5-10mg, oral, at night for a few days.
  In case of excessive somatic symptoms:
  Propranolol 10mg, oral, 8 hourly for 2 weeks

Advice:
Do NOT prescribe diazepam or other benzodiazepine agents for long period.

Referral criteria:
• Severe cases and those that do not respond to short supportive psychotherapy should be referred.

5.1.2 Depression
Description/clinical features:
This is disorder of mood with leading symptoms of:
• Feeling sad
• Loss of interest or pleasure
• Prominent symptoms related to anxiety like disturbed sleep, fatigue, poor concentration and palpitations.

In depression there is normally a sense of loss of significant person or object Co-morbidity situations are also very common.

Non Drug treatment:
Supportive social and psychotherapy

Drug treatment:
First choice:
Tricyclic antidepressants
• Amitriptyline 25 mg, oral, 8 hourly. Maximum dose up to 150mg/day.
  Or
• Imipramine, oral, at bedtime, Initial dose: 25mg, 8 hourly. Maximum 150 mg/day
**Second choice:**
- Fluoxetine 20mg, oral, daily. Maximum dose 40mg/day

**Referral criteria:**
Other types of neurotic disorders like phobias, obsessive – compulsive disorders are less common, and should be referred if they are serious enough.

### 5.2 Psychoses

**Description/clinical features:**
In Psychoses reality testing is usually negative, i.e. the patient may not be able react in a rational expected manner in a particular situation, due largely to thought and perceptual abnormalities (delusions and hallucinations).

These conditions may appear without any known co-morbid physical illness and are thus called “functional psychoses”.

#### 5.2.1 Functional psychoses

**Description/clinical features:**
Among diagnoses that fall under this category are:
- Schizophrenia
- Mania (including bipolar illness)
- Paranoid psychosis
- Non-organic acute psychosis

**Non drug treatment:**
- Reassurance and support of patient and family
- Appropriate medical attention
- Psychotherapy as indicated by clinical presentation and usually of a supportive nature.

**Drug treatment:**
Mild psychotic conditions can be treated with:
- Chlorpromazine 100mg, oral, 8 hourly;
- Haloperidol 1.5mg, oral, 8 hourly;
- If agitation and other symptoms are more severe, sedate with Diazepam 10 – 20mg I.V, and Chlorpromazine 100mg, I.M, in order to facilitate transport to the referral Hospital.
- There are patients who have chronic psychotic disorders like Schizophrenia. These patients should be put on maintenance depot anti-psychotic agent: Fluphenazine Decanoate 25mg, I.M, every 4 weeks.
**Note:** In case of recurrent bipolar illness (manic or severe depression alternating), Lithium Carbonate or Carbazepine can be used as a prophylaxis, but under specialist care.

**Note:** Extra-pyramidal side effects of antipsychotics like dystonic reactions, pseudoparkinsonism and akathisia are common occurrence in those who use psychotropic medication for long periods or at high doses. To counteract these unwanted effects, injection Promethazine 25mg, I.M, once can successfully remove the acute symptoms, but to reduce them on a daily basis, Benzhexol 5-15mg, oral, daily in divided doses

**Or**

Procyclidine 2-10mg, oral, daily should be used.

### 5.2.2 Organic psychoses

**Description/clinical features:**
Physical illnesses are always present. Apart from the usual psychotic symptoms, there is a history of an on-going or recent physical illness, and the patient should also present with some of the following symptoms:

- Clouding of consciousness
- Disorientation especially in time.
- Retention- memory problems (disturbed registration, retention, and recall of memory)
- Presence of visual, tactile and auditory hallucinations. Illusions may dominate the picture
- Psychomotor changes – normally retardation of psychological and minor activities

**Non drug treatment:**
Hospitalization is mandatory for physical and environmental support
Control the acute disturbance

**Drug Treatment:**
Treat medical condition if identified, for agitated and acutely disturbed patient
Haloperidol 5mg, I.M, stat: this can be repeated if required
**Note:** This therapy should have been started in a Psychiatric clinic and carried on at the Periphery for follow up.

**Advice:**
Children with psychiatric symptoms should best be left to mental health professionals for assessment and plan of therapy.
Care should be taken when prescribing to the elderly.
Care should be taken when prescribing to those suffering organic psychosis
Symptoms of extra pyramidal and other anti-psychotic medicine side effect should be early detected and properly handled. These may include: Parkinsonism, dystonic reactions, Tardive dyskinesia and akithisia.
Anti-cholinergic medication like Benztropine 5mg daily is useful in most of these conditions.

**Note:** Patients with known or suspected organic psychotic problem should best be referred without sedation.

**Referral criteria:**
Medication for functional condition should continue for about two weeks and if there is no improvement, refer.
Refer in case of persistent side effects
CHAPTER 6

6.0 EYE DISEASE CONDITION

6.1 Conjunctivitis:

**Description/clinical features:**
Conjunctivitis is an inflammatory condition, which may be caused by viruses, bacteria or allergic reactions. Bacterial conjunctivitis is the commonest form of the eye infections. Known causative bacteria include *Streptococcus pneumonia*, *gonococcus* and *Staphylococcus aureus*. Infection from these organisms is usually bilateral and causes copious purulent discharge with no pain and no blurred vision.

**Drug Treatment:**

**First choice:**
- **Adult** – 0.3% Gentamycin eye drop, 4 hourly for 7 - 10 days
- **Children** - 1% Oxytetracycline eye ointment, 6 hourly for 5 days

**Second choice:**
- **Adults** - 0.5 -1% Chloramphenicol eye drops, 4 hourly for 7 -10 days
- **Children** - 1% Chloramphenical eye ointment, 6 hourly for 7 – 10 days.

**Advice:**
- Wash hands, face and eyes well before applying the ointment
- Try to avoid spreading the disease to others.

**Prevention:**
- Washing face and hands regularly
- If a family member has conjunctivitis, make sure that they use a separate towel and do not come into close contact with other family members.
- Environmental sanitation to reduce spread of infection via flies.
Referral criteria:
If condition is not completely cured in 10 days

6.1.1 Conjunctivitis, allergic

Description/clinical features
Is an acute inflammation of the conjunctiva, or chronic cobblestone elevations of the tarsal conjunctiva or chronic thickening and discoloration of the peri-limbal conjunctiva, associated with moderate to severe itching with Hay fever or other features of allergy.

Drug treatment:
Treatment should be for short-term use to relief of mild symptoms.

First choice:
- 2% Sodium chromoglycate ophthalmic drops instill 1-2 drop 4 times daily for one week.
- Chlorpheniramine maleate 4mg, oral, once daily for 10 days.

Second choice:
- 0.025% Oxymetazoline ophthalmic drops, instills 1-2 drops, 6 hourly daily – short term use.
- Chloramphenicol with 0.3% dexamethasone eye drop 1 – 2 drops, 6 hourly daily – short term use

Advice:
Topical corticosteroids are contraindicated when there is no facility for slit lamp biomicroscopic examination of the eye.

Prevention:
Avoid the underline source.

6.1.2 Conjunctivitis Bacterial

Description/clinical features:
The following organisms may be involved:
- S. aureus
- H. influenzae
- S. pyogenes
- Moraxella species
- S. pneumoniae
- N. gonorrhoeae
- Pseudomonas species

It is usually bilateral. There is a mucopurulent discharge and there may be matting of lashes in the morning. The eyelid may be swollen.
Drug treatment:
- 1% Gentamycin ophthalmic eye drops, instill 1 drop 4 hourly
Or
- 0.5% - 1% Chloramphenicol ophthalmic eye drops, instill 1 drop 4 hourly

6.2 Trachoma
Description/clinical features:
Trachoma is a kerato conjunctivitis caused by Chlamydia trachomatis.
Transmission is usually by contact with formites in unhygienic conditions. The clinical manifestations of the disease initially start as a simple eye infection with itchy eye with profuse watery discharge. If untreated, the disease condition may progress to cornea ulcers, scarring and blindness

Drug treatment:
1% Oxtetracycline eye ointment, 6 hourly for 6 weeks
And
Azithromycin 500mg, oral, 6 hourly for 3 weeks
Or
- Doxycycline 100mg, oral, 12 hourly for 3 weeks
Or
Erythromycin 500mg, oral, 8 hourly for 3 weeks
Children: 10mg/kg, 8 hourly for 3 weeks.

Advice:
Wash face well before applying the ointment.

Follow up:
Weekly to make sure that there is improvement and no further complication rose due trachoma that the patient is using the medicine accordingly.

Prevention:
Wash face and hands regularly, using SAFE strategy.
Try and keep flies away from the eyes as much as possible.

Referral criteria:
If the symptoms get worse despite treatment.
If the condition is not cured after 6 weeks.
If there are any signs of in-turned eye-lashes and/or corneal scarring.
6.3  **Traumatic eye injury**  
**Description/clinical features:**  
Traumatic eye injuries occur from incidents such as from being poked in the eye or hit in the head. Depending on the type of trauma, symptoms can include blurred vision, bulging eye, burning, double vision, dry eyes, floaters, light sensitivity and pain or discomfort of the eye or around the eye. Swelling, dilated pupil or unresponsive to light, loss of vision, limited eye or lid movement or ptosis (drooping eyelids), also may occur.  

**Management**  
Cover affected eye with a sterile eye pad or dressing.  
Give analgesic as required.  
Refer all cases urgently.  
Transfer with patient lying comfortably on his/her back.  

**Caution:** Do not put any eye drop/ointment.

6.4  **Glaucoma**  
**Description/clinical features:**  
Glaucoma is characterized by damage to the optic nerve (in the form of cupping) with associated visual field loss, for which raised intraocular pressure (IOP) is a primary risk factor. Glaucoma may occur as a primary condition or secondary to other ocular conditions. Glaucoma can be further classified as acute chronic and open-versus closed-angle. The condition is usually bilateral, but may be unilateral or asymmetrical (especially with secondary causes).  

**Chronic:**  
- Most common  
- Mostly a symptomatic  
- History of gradual loss of vision in the affected eye or loss of visual field  
- Often suspected after seeing cupping of optic disc on routine fundoscopy or finding elevated intra-ocular pressure on screening.  

**Acute:**  
- Sudden onset of severe pain and eye redness, associated with nausea and vomiting  
- Loss of vision in the affected eye  
- Colored haloes or bright rings around lights  
- Hazy-looking cornea
• Fixed, semi-dilated pupil
• Severely-elevated intra-ocular pressure. When measured with finger palpation, the affected eye feels hard, compared to the other eye.

6.4.1 Open Angle Glaucoma, Chronic

Drug treatment:

First choice:
B-blocker:
Non-selective:
• 0.25% - 0.5% Timolol ophthalmic drops, instill 1 drop twice daily

Selective:
• 0.5% Betaxolol ophthalmic eye drops, instill 1 drop twice daily
  Fewer pulmonary side effects with the use of this medicine

Second Choice:
Prostaglandin analogues:
• Latanoprost, ophthalmic drops, instil 1 drop once daily
  Use as first line if patient has contra-indication to use of ß-blocker.
  Use in place of ß-blocker if patient has intolerable side effects with ß-blocker or
  if there is no significant reduction in IOP with ß-blocker alone.
  Use in combination with ß-blocker if there is significant reduction in IOP on ß-blocker, but patient still has progression of disease or target IOP is not reached on ß-blocker alone

In severe cases, carbonic anhydrate inhibitors:
• Acetazolamide 250 mg, oral, 6 hourly daily
  Use if intra-ocular pressure is not controlled on all the above – usually as a temporizing measure before ocular surgery.

Referral criteria:
If there is no improvement refer to an ophthalmology unit.

6.4.2 Angle Closure Glaucoma, Acute

Drug treatment:
Institute initial therapy and then refer to an ophthalmology unit.
Try to achieve immediate reduction in IOP.
• Acetazolamide 500mg, oral, immediately as a single dose, followed by 250 mg, 6 hourly
• 0.25% or 0.5% Timolol ophthalmic drops, instill 1 drop twice daily.
  Treat patient for associated pain and nausea.
Where these measure fail:

- Mannitol, I.V, 1.5-2g/kg as a 20% solution over 30-60 minutes for short-term use only.

Or

- Glycerin, oral diluted to 50% solution, 1-1.5 g/kg, for short-term use only.

To constrict the pupil (open the angle), once the IOP has dropped:

- 2% Pilocarpine ophthalmic drops, instill 1 drop every 6 hours

_Referential criteria:_

- All to ophthalmology unit

### 6.5 Herpes Zoster Ophthalmicus

**Description/clinical features:**
Herpes zoster ophthalmicus occurs when the varicella-zoster virus reactivates in the trigeminal ganglion and passes down the ophthalmic division of the trigeminal nerve. Patients present with a vesicular rash on the forehead, upper lid and side of the nose. A minority of patients may develop conjunctivitis, keratitis, uveitis and cranial nerve palsies. Permanent sequelae of ophthalmic zoster infection may include chronic ocular inflammation, loss of vision, and debilitating pain. Patients under 50 years old should be offered HIV testing.

**Drug treatment:**

- Acyclovir 800mg, oral, 6 hourly for 10 days
- 1% Acyclovir eye drop 4 hourly for 10 days.
- 1% Chloromphenicol ophthalmic ointment, 6 hourly

For neuralgic pain:

- Potassium permanganates. 1:10 000 aqueous solution, topical, cleanse twice daily

**Plus**

- Silver sulphadiazine, topical, apply twice daily after cleansing
  Follow patient weekly until skin lesions healed.

Best results are obtained if treatment is initiated within the first three days of onset of symptoms.
**Referral criteria:**

- Fluoresce in uptake by the cornea (keratitis)
- Decreased vision, 1 up to 2 line fall off in snellen acuity in affected eye compared to healthy eye
- Afferent pupil defect
- Signs of uveitis

6.6  **Keratitis**

6.6.1  **Keratitis, Herpes Simplex**  
**Description/clinical features:**
Associated features: previous history often, decreased corneal sensation.
Morphology: dendritic ulcer seen on staining with fluoresce in

**Drug treatment:**
- Acyclovir ophthalmic ointment inserted in the lower cul-de-sac 4 hourly.
Continue for 3 days after has healed.

**Note:**
Topical corticosteroids are contraindicated in the treatment of dendritic ulcers. In other settings topical corticosteroids may be used only by personnel with experience in ophthalmology and with access to both a tonometer and a slit lamp.

6.6.2  **Keratitis, Supportive**  
**Description/clinical features**
Painful red eye with corneal lesion that stains with fluoresce in and has creamy white appearance. If RVD + or history of injury to eye with plant matter, need high index of suspicion for fungal infection.

**Drug treatment:**
Treat only if access to still lamp, otherwise refer.
Scrape ulcer for microscopy, culture and sensitivity and modify treatment accordingly.
• Ciprofloxacin, ophthalmic drops, instill 1 drop hourly for 3 days then reduce frequency to 1 drop 3-4 hourly.

Or
• Ofloxacin, ophthalmic drop, instill 1 drop hourly for 3 days then reduce frequency to 1 drop 3 –4 hourly.

If gram positive cocci:

Add
• Vancomycin 25 mg/ml, topical
If fungal infection, change to:
5% Natamycin ophthalmic drops, instill 1 drop 1-2 hourly, initially then after 3-4 days reduce to 1 drop 3-4 hourly.
Continue for 14 –21 days until resolution of infection.

Referral criteria:
• No access to still lamp
• No facilities for microscopy, culture and sensitivity

6.7 Retinitis, HIV CMV

Description/clinical features
CMV retinitis is seen in advanced HIV, with CD 4 count <100. The characteristic appearance is necrosis, i.e white exudates, and hemorrhages at the edges of the exudates. Irreversible blindness occurs once the optic disk is involved.

Drug treatment:
• Ganciclovir, intravitreal, 200 mcg once a week
  Once immune function has been restored with antiretroviral therapy, i.e CD4>100, maintenance ganciclovir can be stopped but monitor for recurrence.

6.8 Uveitis

Description/clinical features:
An inflammation of the uveal tract and adjacent structures. The commonest form is acute anterior uveitis, which presents with pain and photophobia, brow ache, loss of vision, circum corneal ciliary injection and a miotic pupil. Chronic uveitis may lead to cystoids macular edema with decreased central acuity, cataract formation and secondary glaucoma. Numerous systemic diseases can cause uveitis.
‘This condition should be managed at an ophthalmology unit’

**Drug treatment:**

Cycloplegic agents:
- 5% Homatropine ophthalmic drops, instill 1-2 drops 3-4 hourly

**And**

Corticosteroids:
- 1% Prednisolone ophthalmic eye drops, instill 1-2 drops 4 times daily
CHAPTER 7

7.0 OBSTETRICAL AND GYNAECOLOGICAL CONDITIONS

7.1 Dysmenorrhoea

Description/clinical features:
Dysmenorrhoea is painful menstruation. It is present if pain prevents normal activity and requires medication. There are 3 types of dysmenorrhoea:
Primary (no organic cause), Secondary pathological cause e.g. PID and uterine polyposis and membranous (cast of endometrial cavity shed as a single entity (rare). Typically, in primary dysmenorrhoea pain occurs on the first day of menses, usually about the time the flow begins, but it may not be present until the second day. Nausea and vomiting, diarrhea and headache may occur.

Non drug treatment:
Allow bed rest

Drug treatment:
Analgesics and antispasmodics:
- Hyoscine-butylbromide
  Adult: 20mg, 8 hourly; Children 6-12 yrs: 10mg, 8 hourly
  Or
  • Mefenamic acid 500mg, 8 hourly
  Or
  • Ibuprofen 200-600 mg, 8 hourly (maximum 2.4 g/day)
  Or
  • Acetylsalicylic acid 300-600 mg, 4 hourly
  Or
  • Diclofenac 50 mg 2-3 times a day

Treat the underlying condition if known
Advice:
For primary dysmenorrhoea patients may be advised to start taking Ibuprofen one or two days before menses and continue for three to four days during menses to minimize painful menstruation.

7.2 Antepartum Haemorrhage (APH)
Description/clinical features:
Bleeding from the birth canal after the 28th week of gestation. Main forms are placenta praevia and abruptio placenta. Bleeding is painless in placenta praevia. Bleeding may be visible or concealed in abruptio placenta. Pain and shock in abruption placenta correspond with degree of separation.

Treatment guidelines:
Expectant therapy
Allow bed rest
Blood grouping and cross-matching
Active therapy delivery if foetus viable. If a major placental separation has occurred, emergency delivery to minimize the possibility of disseminated Intravascular coagulation

7.3 Post Partum Haemorrhage (PPH)
Description/clinical features:
Blood loss of 500mls or more from genital tract after delivery of the baby.
Primary PPH: bleeding within 24 hours
Secondary PPH: bleeding after 24hours to six weeks post delivery

Causes:
Primary
• Uterine atony
• Genital trauma – perineum, cervix, vagina, anus
• Ruptured uterus
• Acute inversion of the uterus
• Disseminated intravascular coagulopathy
• Retained Placenta, Placenta tissues or membranes

Secondary
• Retain products of conception
• Pueperal sepsis
• Breakdown of a uterine wound after caesarean section.
**Risk Factors:**
There are risk factors for haemorrhage during pregnancy, labour and postpartum. It is important to ask questions that will help to recognize when a woman is at high risk. Use the questions that are appropriate to the women’s condition, depending on whether she is in the antepartum, intrapartum or postpartum period.

**Management:**
Find the cause and treat accordingly  
Proper examination for tears  
Blood for grouping and cross matching

**Non drug treatment:**
- Resuscitation with intravenous fluid. Ringer lactate/Normal saline using 16/18G cannula.  
- Treat according to the cause  
- If uterine atony – Bimanual compression of uterus.  
- Suture if tears  
- Remove retained placenta or Product of conception  
- Blood transfusion 4 to 6 unit depending on haemodynamic status.  
- Uterine massage every 15 minutes for the first two hours

**Drug treatment:**
Oxytocin 20 – 40 IU, I.V, in 1lt 0.9% Sodium Chloride/Ringer Lactate at 60 drops per minute  
If necessary and not contraindicated to patient, add Ergometrine 0.2 - 0.5mg, I.M/I.V,  
**Or**  
Oxytocin 5 Units  
**Plus**  
Ergometrine 0.5 mg, I.M/I.V  
**Or**  
If Oxytocin is not available give  
Misoprostol 1000 microgram’s rectally.

**Prevention:**
- Identify risk factor and refer for delivery in Hospital  
- Active management of third stage of labour with the use of  
Oxytocin 10 I.U immediately after delivery  
**Or**  
Misoprostol 600 microgram’s orally
**Referral Criteria:**
Refer non responded case to higher level facility with donors
Refer severe cases for further management e.g for BT

### 7.4 Urinary Tract Infection during pregnancy

**Description/clinical features:**
Urinary tract infections are infections in the bladder, kidneys, ureters (the tubes that carry urine from your kidneys to your bladder) or urethra (the tube that carries urine from your bladder to the outside of your body). UTIs are caused by bacterial Infection of urinary tract e.g. *E. coli*. The most common type of UTI is a bladder infection; other types of UTIs are kidney infections and infections of the urethra. Whenever possible urine specimen for microscopy, white blood cells, culture and Sensitivity tests should be carried out before drugs are initiated, except on acute condition.

**Non drug treatment:**
- Plenty of fluid intakes
- Improve personal hygiene

**Drug treatment:**
- **First choice:** Amoxicillin 500mg, oral, 8 hourly for 7 to 10 days.
- **Second choice:** Nalidixic acid 100 mg, oral, 6 hourly for 5 days with food
- In case of pyelonephritis Ampicilin 1g, I.V, 8 hourly for 7 days

**Prevention:**
- Regular urine examination during ANC visits to prevent recurrence.
- Frequent voiding of the bladder

### 7.5 Vaginal Discharge during Pregnancy

**Description/clinical features:**
The infection usually polymicrobial and necessitates the use of combined drugs. Vulvo-vaginal candidiasis is characterized by pruritic, curdled milk like vaginal discharge, dysuria and sometimes dyspareunia.
Take carefull history (amount, colour, presence of odor, whether leaves stains in the undercloth etc).

**Drug treatment:**
Nystatin pessaries insert 100,000 IU at night for 14 days
Or
Clotrimazole pessaries/vaginal cream insert/apply once at night for 3 days
Or
Ketoconazole 200 – 600mg, 24 hourly for 10 days
Or
Fluconazole 200mg once daily for 14 days

7.5.1 Tricomanial vaginitis (TV)
**Description/clinical features:**
Frothy/yellow green discharge, itching and dysuria

**Drug Treatment:**
Metronidazole 400-500mg, oral, 8 hourly for 5 days.
Treat both partners.

7.5.2 Gonococcal vaginitis
**Description/clinical features:**
Purulent yellow discharge, dysuria

**Drug treatment:**
Benzathine Penicillin 2.4 MU, I.M, 2 doses.
Patients allergic to Penicillin:
Erythromycin 500mg, oral, 6 hourly.
Persisted infections with fungal organisms require rule out systemic disorder such as diabetes mellitus.

**Note:**
The dose of Erythromycin may be reduced to every 8 hours if side effects are intolerable, but the period should be extended appropriately.
Leukorrhoea (increased whitish discharge is common during pregnancy but does not require treatment.

**Caution:**
- Avoid taking both medicines concomitantly if side effects are intolerable
- Avoid Metronidazole in the first trimester
- Avoid alcohol while taking Metronidazole.
Referral Criteria:
If the condition persists despite of proper and adequate treatment refer to higher level for further investigation.

7.6 Abortion
Description/clinical features:
Interruption of pregnancy before it is viable, legally at 28th week of gestation. Clinical types are recognized according to findings when the patient is first seen. These include: threatened abortion, inevitable abortion, incomplete abortion, complete abortion and missed abortion. Vaginal bleeding which may be very heavy in incomplete abortion, intermittent pain which ceases when abortion is complete, and cervical dilatation in inevitable and incomplete abortion. In missed abortion, dead ovum retained for several weeks while symptoms and signs of pregnancy disappear.
When infected (septic abortion) patient presents with fever, tachycardia, offensive vaginal discharge, pelvic and abdominal pain.

7.6.1 Post Abortal Sepsis
Description/clinical features:
Pyrexia in women who has aborted or miscarried in the previous 6 weeks may be due to puerperal or abortal sepsis and should be managed actively. Abdominal pain in addition to pyrexia is strongly suggestive. The uterus may need evacuation.

Non drug treatment:
• Counseling
• Evacuation of the uterus and surgical management of complications after 4 to 6 hourly of antibiotics cover.
• Manual vacuum aspiration (MVA) if pregnant less than 12 weeks.
• Family planning counselling and supply of opted method.

Drug treatment:
Ampicillin 1g, I.V, 6 hourly
Plus
Gentamycin, I.V, 5mg/kg daily.
Plus
Metronidazole 500mg, I.V, 8 hourly for 10 days.

Change to oral treatment after improvement.
Amoxicillin 500mg, oral, 8 hourly
**Plus**
Metronidazole 400-500mg, oral, 8 hourly

**Plus**
Doxycycline 200mg, oral, stat, then 100 mg daily for 10 days

**Note:**
- Pelvic abscess may be suspected if after 48 hours no response in this case laparatomy or referral may necessary.

**Referral Criteria:**
- Evidence of trauma
- No treatment to treatment

**7.6.2 Incomplete and Missed abortion**

*Description clinical features:*
Incomplete abortion: Diagnosed when a woman has an open cervix and she has passed some of the pregnancy tissue.

Missed abortion: Diagnosed when a woman has a closed cervix and a uterus that does not increase in size over time or has an ultrasound that shows a fetal demise.

**Non drug Treatment:**
- MVA if uterus is less than 12 weeks
- Evacuation if uterus more than 12 weeks.
- Dilatation and curettage under general anaesthesia if missed abortion
- Counselling and provision of opted method.

**Drug Treatment:**
For incomplete abortion
Misoprostol 600 mcg, oral, single dose

Or
Misoprostol 400 mcg, sublingual

For missed abortion:
Misoprostol 800 mcg, vaginaly

Or
Misoprostol 600 mcg, sublingual
Contraindications of misoprostol:
• Allergy to misoprostol or other prostaglandins
• Confirmed or suspected ectopic pregnancy or undiagnosed adnexal mass
• IUD in place (remove before beginning misoprostol regimen)

Precautions:
• Heavy bleeding, coagulation disorder or severe anaemia
• Serious pelvic infection/sepsis
• Clinically ill and/or unstable health problems

7.6.3 Prolonged Rupture of Membrane (PROM)
Description/Clinical features:
Rupture of membrane before onset of labour

7.6.3.1 Pre-term premature rupture of membrane (PPROM)
Rupture of membrane before term i.e. 37 completed weeks

Description/Clinical features:
Characterized by leakage of watery fluid per vagina which can be detected by performing a sterile speculum examination. Prolonged PROM for more than 12 hours is a risk of ascending infection which leads to chorioamnionitis (Injection of chorion amnion and amniotic fluid).

Non drug treatment:
PROM at term: Delivery within 24hours
PPROM: If no sign of infection, wait for foetal maturity and give prophylaxis

Drug treatment:
Amoxycillin 500mg, oral, 6 hourly for 10days
Or
Erythromycin 500mg, oral, 6 hourly for 10 days
If there are signs of infections, pyrexia, foul smelling liquor (chorioamnionitis)
Benzly penicilline 2MU, I.V, 6hourly
Or
Chloramphenicol 500mg, I.V, 6 hourly.
Urgent Delivery irrespective of gestational age
7.7 Prophylaxis for Caesarian Section

**Drug treatment:**
Immediately before operation give Benzylpenicillin 5MU, I.V, as a single dose

**Plus**
Chloramphenicol 1 g, I.V, as single dose or Ceftriaxone 1g, I.V

**Note:**
Facilitate early delivery
Continue with antibiotics after delivery for 3-5 days
Use of antibiotics for prophylaxis during surgery, should be evaluated from situation to
Situation and not generalized

7.8 Nausea and vomiting in pregnancy

**Non drug Treatment:**
If vomiting is not excessive, advice to take small but frequent meals and drinks

**Drug Treatment:**
**First choice:**
Promethazine 25mg, oral, at night

**Second choice:**
For severe cases only, Prochlorperazine 5mg, oral, 8 hourly.

7.8.1 Hyperemesis Gravidarum (vomiting and dehydration)

**Description/clinical features**
Recurrent vomiting leading to ketosis generally on the first trimester.
Exclude - medical causes e.g thyrotoxicosis
- Molar pregnancy

**Non drug treatment:**
- Counseling
- Frequent small, dry meals
- Avoid fatty and spicy food
- Restrict oral intake for 24 – 48 hours but ensure adequate intravenous hydration
- Baked fresh ginger root 250mg 4 times daily may have benefit

**Drug treatment:**
• Correct electrolyte imbalance with I.V fluids.
• Pyridoxine 25 mg ,oral 8 hourly
• Metoclopromide 10 – 20mg, oral or I.V, 6 hourly as needed.
• Vitamin B complex , I.V, 10 mls in 5% Dextrose or Ringer

7.9  Anaemia in Pregnancy

Description/clinical features:
Haemoglobin (Hb) of less than 11 g/dl.

Non-drug treatment:
Lifestyle adjustment to prevent nutritional deficiency
Avoid ‘PICA’, i.e., eating sand.

Drug treatment:
Treat as other anaemia

Prophylaxis:
• Ferrous sulphate 170 mg, oral, daily
  Plus
• Folic acid 5 mg, oral, daily
  Iron and folic acid supplementation should be continued during lactation. Other causes of anaemia should be treated according to the diagnosis.

Folic acid deficiency
• Folic acid, oral, 5 mg daily
  Treat until Hb is normal. Hb is expected to rise by at least 0.2 g per week if diagnosis is correct.
  Associated vitamin deficiencies should be identified and treated accordingly.

Iron deficiency
• Ferrous sulphate 200 mg, oral, 12 hourly.

  Continue for 3 months after the Hb reached normal to replenish iron stores.

Referral criteria:
• Symptomatic anaemia
• No response to management
• Anaemia due to cause other than Iron/Folic acid deficiency
7.10 Hypertension in Pregnancy

7.10.1 Essential Hypertension

Description/Clinical features:
This is also called primary hypertension where systolic pressure raises to 140 – 159 mmHg and/or diastolic pressure of 90 – 99 mmHg. The underlying cause of primary hypertension is not clear. High blood pressure can cause symptoms such as headache, dizziness, fatigue, and ringing in the ears. However it may cause no symptoms at all. High blood pressure can cause damage to many organs, including the brain, eyes, heart and kidneys, as well as to arteries throughout the body.

**Drug treatment:**
Methyldopa 250 – 500 mg, oral, 8 hourly

7.10.2 Pregnancy Induced hypertension (PIH)

Description/clinical features:
Pregnancy-induced hypertension (PIH) is a form of high blood pressure in pregnancy. It occurs in about 5 to 8 percent of all pregnancies. Another type of high blood pressure is chronic hypertension - high blood pressure that is present before pregnancy begins.

Pregnancy-induced hypertension is also called *Toxemia* or *Preeclampsia*. It occurs most often in young women with a first pregnancy. It is more common in twin pregnancies, in women with chronic hypertension, preexisting diabetes, and in women who had PIH in a previous pregnancy

**Symptoms:**
- increased blood pressure
- protein in the urine
- edema (swelling)
- sudden weight gain
- visual changes such as blurred or double vision
- nausea, vomiting
- right-sided upper abdominal pain or pain around the stomach
- urinating small amounts
- changes in liver or kidney function tests

**Diagnosis:**
- blood pressure measurement
- urine testing
• assessment of edema
• frequent weight measurements
• eye examination to check for retinal changes
• liver and kidney function tests
• blood clotting tests

Mild PIH  
**Diastolic:** 90 – 100 mmHg, no Proteinuria (protein in urine)

**Advice:**  
• Bed rest  
• Weekly antenatal clinic visits  
• May be given low doses of Acetylsalicylic acid, oral, 75mg once daily.

Moderate PIH  
**Drug treatment:**  
**Diastolic:** 100-110 mm Hg, no Proteinuria Consider low dose of Acetylsalicylic acid, oral, 75 mg once daily plan immediate delivery at gestation above 37 weeks.
Admit and monitor BP up to 6 times per day.
Methyldopa 250 – 500 mg, oral, 8 hourly.

Severe PIH  
**Drug treatment:**  
**Diastolic**>110  
Nifedipine 10 mg, sublingual, stat  
Or  
Hydralazine 12.5mg, I.M stat.
The need for more doses indicates the urgency for delivery.

7.11 Pre-Eclamptic Toxaemia (Proteinuria PIH)  
**Description/clinical features:**  
A complication of late pregnancy, associated with raised blood pressure.

**Symptoms:**  
**In mild cases:** there may be no obvious symptoms apart from raised sphygmomanometer readings  
**In severe cases:** headaches, blurred vision, intolerance of light, nausea and vomiting, and swollen ankles due to fluid retention; protein may appear in urine.  
**If blood pressure is not brought under control:** eclampsia -
convulsions, drowsiness, unconsciousness - develop, threatening the life of mother and baby.

**Note:**
- Exclude UTI
- Check urine for protein daily
- Plan delivery at 37 weeks or before

**Drug treatment:**
Consider low dose of Acetylsalicylic acid 75 mg once daily. Hydralazine 12.5 mg, I.M, stat.
*Or*
Nifedipine 10 mg, sublingual, stat.

7.11.1 **Imminent Eclampsia**

*Description/clinical features*
This is PIH characterized by visual disturbance, epigastric pain and or signs of brisk reflexes.

**Drug treatment:**
Prevent convulsion:
- Magnesium sulphate 4g, bolus slowly I.V for 10 -15minutes and then maintanence dose of 1g per hour for 24 hours post derivery or after last fit
  - If diastolic pressure still above 110mmHg:
- Hydralazine 12.5 mg, I.M, intermittently.

*Plus*
- Nifedipine 10mg, oral, once a day or 12 hourly depending on severity.

7.11.2 **Eclampsia (Proteinuria PIH with Fits)**

*Description/clinical features:*
It is the occurrence of seizures (convulsions) in a pregnant woman. The seizures are unrelated to brain conditions and usually happen after the 20\textsuperscript{th} week of pregnancy.
Patient with eclampsia developing convulsions.

**Non drug treatment:**
Advice adequate dietary Calcium.
Bed rest, preferably in hospital
Monitor BP, urine output, renal and liver function test, proteinuria and foetal condition.
**Drug treatment:**

Stop convulsions:
Diazepam 10-20mg, I.V bolus.

**Plus**
Loading dose of Magnesium Sulphate 4g, I.V, in 20mls normal saline slowly for 10-15 minutes.

**Maintenance dose:**
Magnesium Sulphate 4g, I.V, in 1000mls normal saline 8 hourly.
In case of recurrent seizure add Magnesium Sulphate 2g in 10mls Normal saline I.V, slowly for 10 minutes
Give antihypertensive as above
Plan urgent delivery within 12 hours, preferable vaginal delivery, induction with assisted vaginal delivery of the 2nd stage
- Caesarean section indicated for the obstetrical Indication

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**Note:** Maintain patient airway and secure I.V line with a cannular.

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### 7.12 Diabetes in Pregnancy

**Description/clinical features:**
Diabetes mellitus in pregnancy refers to fasting blood glucose more or equal to 6.9 or more or equal to 11.0mmol/l 2 hours after 75mg of glucose load. Impaired glucose tolerance means, blood glucose 7.8-11mmol/l 2 hours after 75mg glucose load.

Gestational diabetes develops in women during pregnancy because the mother’s body is not able to produce enough insulin. High blood sugar levels in the mother’s body are passed through the placenta to the developing baby. This can cause health problems. Gestational diabetes usually begins in the second half of pregnancy, and goes away after the baby is born. The cause of gestational diabetes is unknown. It is thought that the hormones produced during pregnancy may block the action of insulin.

**Management:**

**Idealy this should be managed by a specialist**
- Diabetic pregnant women require management before and throughout pregnancy.
- Diabetes should be controlled by insulin and diet and not oral hypoglycaemics.
- Diabetic should be advised to start insulin before conceiving.
- Throughout pregnancy blood sugar should strictly be within the
range of 4-6 mmo/l.
• Labour if possible should be in a tertiary level hospital
• Labour should be as short as possible.

**Non drug treatment:**

**Diet**
• Diabetic diet of not less than 1800Kcal unless grossly obese (Protein 15%, Fat 25%, high fibre carbohydrate 60%)
• Eat 3 meals and 3-4 snacks/day
• Elective delivery at about 38 weeks’ gestation

**Drug treatment:**
Insulin requirement will increase as pregnancy progresses and later admission may be necessary.

**Preferable Regimen:**
Use intermediate acting insulin (lente) between 21.00 – 22.00 to maintain fasting blood sugar level and short acting Insulin (soluble) with all 3 mls to maintain random blood sugar level.

Starting dose may be based on previous Insulin requirement if known, or empiric starting dose.

**To maintain fasting blood sugar level:**
Intermediate acting Insulin 10 units

**To maintain random blood sugar level:**
Insulin soluble, short acting 5 units with all 3 meals
Adjust Insulin dosage daily according to blood glucose profile, until control is adequate.

**Where the above ideal regimen is not feasible**
Twice daily regimen with biphasic Insulin.
Empiric starting dose if previous Insulin requirement is not known.
**Daily dose:** 0.2 units/kg/day 2/3 with break fast and 1/3 with supper.
Titrate daily to achieve target blood glucose as above.

**During Labour:**
Monitor serum glucose hourly.
Administer short acting Insulin to maintain blood glucose levels.
• Insulin, soluble, short acting continuous, I.V infusion, 10 units plus 20 mmol Potassium chloride in 1Lt, 5% dextrose at an infusion rate
of 100mls/hour i.e. 1 unit of Insulin/hour
If blood glucose less than 4 mmol, discontinue Insulin.
If above 9 increases to 20 units per litre.

The post partum insulin requirement decrease rapidly.
During the first 48 hours blood glucose levels are maintained by 4 hourly blood glucose measurement and regular short acting insulin administration.
Resume pre pregnancy insulin or oral hypoglycaemic regimen once eating a full diet.
The new born is at risk of:
- Hypoglycaemia
- Respiratory distress
- Hyperbilirubinaemia
- Congenital abnormalities

**Post partum contraception**
Tubal ligation should be considered
Consider:
Low – dose combined contraceptive in well controlled cases.
Progesterone only preparation or intra uterine device if the control is unsuitable

**7.13 Respiratory Distress Syndrome in new born**

*Description/clinical features:*
Respiratory Distress Syndrome is likely to occur in newborn and in premature labour before 36 weeks gestation.

*Non drug treatment:*
Position the baby
Keep the baby warm
Clear air way - suction
Cardio pulmonary rescusitation
Give Oxygen

*Prevention:*
Give mother Steroids 24 - 48 hours prior to delivery

*First choice:*
Hydrocortisone 250 mg, I.V, repeat after 24 hours.

*Second choice:*
Dexamethasone 12 mg, I.V, low doses at an interval of 12 hours
Myometrial Stimulants (Oxytocics)
- Myometrial stimulants should be used with great care before delivery in high porous women.
- Use in obstructed labour should be avoided.
- Oxytocics are indicated for:
  - Argumentation of labour
  - Induction of labour.
  - Uterine stimulation after delivery.

7.14 Labour Induction

Description/clinical features:
Induction of labour is carried out when it is felt that the baby is better off out of the mother than inside. This means that something is making its residence in mother womb risky - be it for mother or the baby.

The most common reason for inducing labour is due to going over dates. Other reasons include diseases of pregnancy (eg. preeclampsia), poor growth in the baby, or unexplained bleeding at term. The aim when inducing labour is to make it as much like a normal labour as possible. By doing this, the chances of a normal delivery are increased, and it needn’t be more painful

Non drug treatment:
Reassurance of patient.

Drug treatment:
If no progress of labour is achieved give:
Oxytocin, I.V infusion as follows:
Dilute 2 units of Oxytocin in 1Litre of Ringer Lactate Solution to make a solution of 2 milliunits/ml.

Cervix unfavourable
Prostaglandins as:
Misoprostol 25 mcg, vaginal,

After 4 hours follow with:
Misoprostol 25mcg, oral, 2 hourly until in labor.
If no response to first two doses:
Increase to 50mcg, 2 hourly. Vaginal doses may be omitted.
### Augmentation of Labour
- If the membranes already ruptured and no labour progressing, the steps above should be followed.
- Obstructed labour could be the cause of labour failure.

### Uterine stimulation after delivery.
- Oxytocin 10 units, I.M, after delivery of the infant.
  When no response gives:
  - Oxytocin 10-20 units, I.V infusion, in 1 litre of Ringer Lactate running at 10-20 doses per minute.
- Or
  - Ergometrine 0.5mg, I.M, after delivery of the infant, in the absence of myometrial contraction and to prevent post partum hemorrhage or Misoprostol 600mcg orally.

### Myometrial Relaxants
These are used to relax the uterus in order to:
- relieve foetal distress immediately prior to LSCS
- Stop uterine contraction in premature labour
- prevent uterine rupture.
- Perform external cephalic version.

### Drug treatment:
Salbutamol 4mg, oral, 8 hourly.

### Medicines in pregnancy and lactation
- All medicines if possible, should be avoided during the first trimester.
- Well known medicine and their use in pregnancy and lactation, which have been documented as safe, should be preferred. Avoid medicine which their safety bin pregnancy is not known.

### 7.15 Hormonal Contraception
**Description/clinical features:**
Oral contraceptives (Oestrogen – Progestogen combinitons) are used primarily for prevention of conception. May also be used in treatment of dysfunctional uterine bleeding, dysmenorrhoea or endometriosis.
The goal of therapy in the use of these products for contraception is
to provide optional prevention of pregnancy while minimizing the symptoms and long term risks associated with excess or deficiency of the oestrogen and progestogen components.

The following questions may be asked to the woman intending to start taking contraceptives before they are prescribed.

**Note:**
Detailed information can be obtained from the Reproductive Health Clinic.

**Check List Questions**
If the answer to All questions is NO the women may be given any oral contraceptives. If in any of the questions the answer is YES. Consult clinician.

- History of severe leg pain or swelling of calf?
  *Only when history of DVT/PE (Deep Vein Thrombosis/Pulmonary Embolism) or Current DVT/PE*
- History of sugar in urine?
  *Can use except when accompanied with neuropathy, retinopathy, nephropathy.*
- History of yellow eyes or skin?
- Severe chest pain?
- Unusual shortness of breath after working or light work?
  *Complicated valvular HD – cant use, if uncomplicated valvular disease you can use.*
- Severe headaches (not relieved by headache tablets)
- Bleeding and/or between periods after sexual intercourse?
  *Can use*
- Missed a menstrual period?
  *Can’t use until investigated for pregnancy.*
- Missed a menstrual period, then started bleeding?
  *Can use*
- Very heavy menstrual periods?
  *Can use*
- Increased frequency of menstrual periods
  *Can use*
- History of mental disturbances?
- Goiter or history of goiter?
  *Can use*
- 35 years of age and over?
  *If smokes < 15 cigarettes – use with cautions if > 15 cigarettes*
**do not use**
- Painful varicose veins?
- Had any surgical operations within the last 2 weeks?

*With prolonged immobilization – Do not use – prolonged immobilization – can use.*
- Normal delivery within 6 weeks?

*Can use (48 hours < 3 weeks use with caution)*
- Received treatment for high blood pressure?

*Can use*
- History of epilepsy.

**Note:**
Establish the age of the woman intending to use contraceptives

**Oral Contraceptives (OCs)**
They fall into two major categories:

**a) Combined Oral contraceptives (COCs)**
Oestrogen 30 – 35 micrograms (as ethinylestradiol) - “Low Dose”
Oestrogen 50 micrograms + progestogen - “High Dose”

**Triphasic pills** – contain phased levels which closely mimic normal cyclical hormonal activity

**Note:**
- Lower oestrogen dose pills cause fewer side effects than higher dose pills
- Mid-cycle spotting in patients on 30 microgram COCs can be managed by changing to 50
- microgram COCs
- Menstruation on COCs will be regular, light and short

**b) Progestogen Only Pills (POPs)**
These contain norethisterone, or norethindrone or norgestrel or levonorgestrel. This type is suitable for lactating mothers or women with mild or moderate hypertension.
Menstrual irregularity is a common side effect.

**POP Use with caution in**
- Current DVT/PE
- Ischaemic H.D
• Cerebro vascular accident
• Headache with neurological symptoms
• Post cancer and no evidence of current disease for 5 years.
• Viral hepatitis
• Certain anticonvulsants

**POP can not be used**

**Current Cancer**

**Management**
• Instruct women always to inform the doctor or nurse that they are on contraceptives while attending clinic or hospital.
• Women on Oral Contraceptives need regular physical check-ups including blood pressure measurement every six months or if women develop depression after starting OCs. Not necessary

**Need to Withdraw COCs or POPs in**
• Pregnancy
• Severe headaches especially associated with visual disturbances
• Numbness or paresis of extremities
• Unexplained chest pain or shortness of breath
• Severe leg pains
• Development of any of the absolute contra-indication conditions

**Note:**

i. **Medicine Reducing Effect of Oral Contraceptives**
The following drugs are likely to reduce the effectiveness of OCs and a woman may become pregnant. If it is unavoidable to prescribe the following drugs, patients should be cautioned appropriately; and if possible advised to use additional methods of contraception such as condoms.

• **Hypnotic/sedatives and anti-migraine medication** such as barbiturates, chloral hydrate, diazepam, phenytoin
• **Anti acids:** Aluminium hydroxide, magnesium hydroxide, magnesium trisilicate. *No – can use*
• **Anti-tuberculosis medicines** (rifampin) *With caution*
• **Certain antibiotics:** ampicillin and other penicillins and tetracyclines *No – She can use.*
• **Antiretroviral medicines** (Nevirapine, and ritonavir) *Can use*
Note:  
- For short term use of these drug, employing additional contraceptive methods may be beneficial e.g. condoms or abstaining from intercourse.

ii. Medicines made less effective by Oral Contraceptives

Prescribers might consider increasing the doses of the following drugs, known with careful monitoring

- Anticonvulsant  (*Use with caution*)
- Antidiabetic agents  (*No*)
- Anticoagulants
- Antihypertensive agents (methyldopa)
- Corticosteroid
- Hypnotics, sedatives or other CNS depressants

Post Coital Contraception (*“morning-after pill”*)

The method is applicable mostly after rape and unprotected sexual intercourse where pregnancy is not desired. Within 3 days (72 hours) of unprotected sexual intercourse, give combined oral Contraceptive 100 microgram Ethinyloestradiol and 500 micrograms Levonorgestrel (2 high dose COC tablets)

Or

When this preparation is not available, use 3 tablets each containing Ethinyloestradiol 30-35 micrograms and Levonorgestrel 150-250 microgram (3 low dose COC tablets).
- Repeat this dose after twelve hours
- Advice to return to physician if menstruation does not occur within 3 weeks
- Give advice on contraceptive use
- Rape victims should also be given Erythromycin 250mg, oral, 6 hourly for 5 days
- Offer counseling

Long Term Hormonal Contraceptives

These contraceptives should be prescribed by medical doctor’s only or trained family planning staff.

i. Injectable Contraceptive

Medroxyprogesterone acetate 150mg, I.M, every twelve weeks.
ii. Implants
Levonorgestred in six silastic capsules in implanted in the left upper arm under local anaesthesia.

Note:
• 6 Norplants prevent pregnancy for 5 years
• 2 Jadelle implanon prevent pregnancy for 3 years
• Fertility will return soon after the capsules are taken.
• No known serious side effects.

Use with caution:
• Active viral hepatitis
• Breast feeding
• Current DVT/PE
• Current history of ischaemic H.D
• Stroke
• Headache with focal neurologic symptoms
• Unexplained vaginal bleeding
• Past history of cancer and no evidence of the disease for 5 years
• Severe cirrhosis
• Liver tumours bening and malignant
• Using rifampicin or anti convulsants.
CHAPTER

8

8.0  BACTERIAL INFECTIONS

8.1  Severe infections – Septicemia

Description/clinical features:
Septicaemia is caused by the spread of bacteria infection into the bloodstream. This might happen in such conditions as severe skin or gland infections, pneumonia, and meningitis. Malnourished and very young babies are more predisposed.

Drug treatment:
Treat any complications that need emergency management first, e.g. fits, shock, coma, etc.

First choice:
Adult: Ceftriaxone 2g, I.V, 12 hourly for 10 days.
Infant and children: 20-80mg/kg body weight, daily by I.V infusion (over 60 minutes) for 10 days.
Plus:
Gentamicin 2.5mg/kg body weight, 12 hourly for 10 days

Second choice- to be applied for specific infections:

8.2  Suspected meningococcal infection

Drug treatment:
Adults: Benzyl penicillin (penicillin G), I.V, 100,000 units per kg/body weight 4 hourly
Plus:
Dexamethasone I.V, 4mg/kg body weight, 8 hourly for 3 days.
Infants: 50mg/kg body weight, I.V, 8 hourly for 10 days.
Children 1month-12 years: 60mg/kg body weight, I.V, 6 hourly for 10 days.
Plus (for infants and children):
Dexamethasone I.V, 0.15mg/kg body weight, 6 hourly for 3 days.
Plus: symptomatic treatment (Fever and headache)
8.3 Suspected staphylococcal infection

**Drug treatment:**
Cloxacillin, I.V, 50mg/kg body weight, 6 hourly for 5 – 7 days.

**Advice:**
- Ensure the patient drinks a lot of fluids; this will help to flush out infection.
- Patients /relatives should return if symptoms/signs worsen.
- Review after completion of antibiotic or earlier if condition deteriorates.

**Prevention:**
Early effective treatment

**Referral criteria:**
Refer all complicated cases urgently
CHAPTER 9

9.0 URINARY TRACT INFECTION (UTI)

*Description/clinical features:* Urinary tract infections are infections in the bladder, kidneys, ureters (the tubes that carry urine from your kidneys to your bladder) or urethra (the tube that carries urine from your bladder to the outside of your body). UTIs are caused by bacterial infection of urinary tract e.g. *E. coli*. The most common type of UTI is a bladder infection; other types of UTIs are kidney infections and infections of the urethra. Whenever possible urine specimen for microscopy, white blood cells, culture and Sensitivity tests should be carried out before drugs are initiated, except on acute condition.

*Drug treatment:*  
**First choice:**  
**Adults:** Co-trimoxazole 960mg, oral, 12 hourly for 10 days  
**Children:** Co-trimoxazole 20mg/kg, oral, 12 hourly for 10 days.  
**Infants below 6 months:** Gentamycin I.M, 2mg/Kg, 12hourly for 5 days.  
**Infants above 6 months:** Gentamycin I.M, 2-3mg/Kg, 8hourly for 5 days.  
**Prophylactic treatment:** Nitrofurantoin 2mg/kg, oral, once a day for 1 month (after 10 days check for urine analysis)

**Second choice:**  
**Adults:** Amoxicillin 500mg, oral, 8 hourly for 10 days.  
**Children:** Amoxicillin 250mg, oral, 8 hourly for 10 days.  
Amoxicillin: Drug of choice for pregnant and lactating women

**Prevention:**  
- Advice personal hygiene after defecation
**Advice:**
Do not give Co-trimoxazole to pregnant or lactating women.

**Referral criteria:**
- Failure to respond to treatment.
- Repeated infections.
- Kidney infection (Pyelonephritis)

9.1 **Cystitis (Bladder Infection)**
**Description/clinical features:**
This condition usually occurs in women. Bladder stones predispose to infection.

**Drug treatment:**
- As for UTI

9.2 **Pyelonephritis (Kidney infection)**
**Description/clinical features:**
Pyelonephritis is an inflammation of renal and parenchyma pelvis. Infections usually occur by the ascending route. It is commonly caused by gram-negative organisms like *E. coli*. Clinical features include: chills, fever, flank pain and vomiting.

**Non drug treatment:**
Hydration: Give plenty of fluids – oral or I.V as required

**Drug treatment:**
**First choice:**
- **Adults:** Nitrofurantoin 100mg, oral, 6 hourly for 10 days
- **Or**
  Amoxicillin 500mg, oral, 8 hourly for 10 days

**If patient is vomiting:**
Ampicillin 100mg/kg body weight by I.V or I.M injection.

**Second choice:**
- **Adults:** Co-trimoxazole 960mg, oral, 12 hourly for 10 days
- **Children:** Co-trimoxazole 20mg/kg, oral, 12 hourly for 10 days.

**Prevention:**
Early effective treatment of UTI / Cystitis

**Referral criteria:**
Refer complicated cases to high level hospital.
9.3  **Kidney stones (Renal calculi)**  
**Description/clinical features:**  
Presence of the stone(s) in the kidney which causes pain, blood in the urine and or infection.

**Drug treatment:**  
**First choice:**  
- If infection is present, give:  
  Co-trimoxazole 960mg, oral, 12 hourly for 10 days.  
  Or  
  Amoxycillin 500mg, oral, 8 hourly for 7 days  
  And  
  Mefenamic acid 250 mg, oral, 8 hourly for 5 days

**Advice:**  
- Patient must drink a lot of fluids.

**Referral Criteria:**  
Refer all severe pain, repeated episodes and severe infection e.g. Pyelonephritis

9.4  **Acute Epididymo – Orchitis**  
**Description/clinical features:**  
An acute severe inflammation of the epididymis testis and spermatic cord man, swollen and tender epididymis, severe pain of one or both testes and redness dermatous scrotum causative organism include filarial worms, Chlamydia trachomatous, Neisserria gonorrhoea, E. coli as well as viruses such as which cause mumps.  
This is usually a complication of two conditions – UTI or gonorrhoea.

**Drug treatment:**  
- If underlying UTI, treat as for UTI.  
- If underlying Gonorrhrea treat as for gonorrhoea- **EXAMINE AND TREAT ALL SEXUAL PARTNERS.**  
  - Indomethacine 25mg, oral, 4 hourly for 5 days.

**Advice:**  
- Patient should rest in bed.  
- Review after 5 days or earlier if condition worsens.

**Referral Criteria:**  
- Failure to responds to treatment.
9.5 Urinary retention

Description/clinical features:
This usually occurs in older men, due to enlargement of the prostate gland.

Non drug treatment:
- If the retention is of short duration try to get the patient to pass urine voluntarily.
- Sterile technique to allow the urine to drain out slowly by catheter, once the bladder is emptied removes the catheter. (This should be performed by trained personnel).

Drug treatment:
- Treat any associated infection – as for UTI

Prevention:
- Early medical check up for enlargement of prostate glands.

Advice:
- Advise patient who has had a previous problem to pass urine (empty his bladder) frequently.
- Instruct the patient to return early if symptoms of retention occurs: e.g. lower abdominal discomfort or swelling, no or little urine passed.

Referral Criteria:
- First episode, but long duration (more than 24 hours)
- First episode but urinary catheter cannot be passed (nobody trained in technique or unsuccessful attempt).
- Repeated episodes.
- Severely ill patient.
10.1 Bone or joint infection (Osteomyelitis/Septic Arthritis)

**Description/clinical features:**
These are acute infections caused by bacteria, often a complication of traumatic injury to a limb. Common symptoms are fever, malaise and severe pain at the site of bone infection. If the infection is close to a joint there may be a swelling of the joint. Staphylococci are the most frequent responsible organism *Salmonella osteomyelitis* infection is a common complication of sickle cell anaemia. Tuberculosis osteomyelitis occurs in association with tuberculosis.

**Non drug treatment:**
Rest and immobilization.
Surgical drainage: always consider early drainage by orthopedic surgeon.
## Drug treatment

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Osteomyelitis</td>
<td>Surgical drainage (recommended in all cases presenting with history &gt; 24 hours) Flucloxacillin 1 to 2g, I.V, 6 hourly or Clindamycin 600mg, I.V, 8 hourly.</td>
<td>6 weeks or stop at 3 weeks if X-ray normal</td>
</tr>
<tr>
<td>Chronic Osteomyelitis</td>
<td>Surgery. Antibiotics not generally recommended</td>
<td></td>
</tr>
<tr>
<td>Osteomyelitis in patient with sickle cell anaemia</td>
<td>Flucloxacillin 2g, I.V, 1 to 6 hourly Plus Chloramphenicol 500mg, I.V, 6 hourly (if salmonella is suspected) check Ciprofloxacin with sickle cell patients</td>
<td>5 to 12 weeks 6 to 12 weeks 2 to 3 weeks</td>
</tr>
<tr>
<td>Septic Arthritis</td>
<td>Surgical drainage Flucloxacillin or Clindamycin as for acute Osteomyelitis</td>
<td></td>
</tr>
<tr>
<td>Gonococcal Arthritis</td>
<td>Benzylpenicillin 2.5 to 5 M.U, I.V, , 6 hourly or (if penicillin resistant) See STI Urethritis Kanamycin, I.M, once daily</td>
<td>7 days</td>
</tr>
<tr>
<td>Compound Fracture (no infection established)</td>
<td>Flucloxacillin 1g, I.V, 6 hourly or Clindamycin 600mg, I.V, 8 hourly</td>
<td>3 days</td>
</tr>
</tbody>
</table>
Note:

On Acute osteomyelitis

- Culture and sensitivity tests are essential to determine further treatment
- Treatment may be completed orally after 4 weeks, if fever and toxicity have resolved.
- ESR useful as guide of efficacy of treatment

Alternative second line medicines for staphylococcal infection include Cephalosporin, Co-trimoxazole and Chloramphenicol

Treatment guidelines:

(a) Acute osteomyelitis

Adults: Cloxacillin 2-3g, I.V, 6 hourly for 7 days and then orally for a total of 4 weeks

Or

Clindamycin 0.3 – 0.6g, I.V, 6 hourly for 7 days and treat orally for a total of 4 weeks.

Children: Cloxacillin 25 mg/kg body weight, I.V, initially 6 hourly for 7 days and then orally for a total of 4 weeks

(b) In patients with sickle cell osteomyelitis gives

Adults: Ampicillin 2 g, I.V, 6 hourly in combination with Flucloxacillin 2 g, I.V, 6 hourly for 7 days then orally for a total of 4 weeks.

Children: Ampicillin 50mg/kg body weight, I.V, 6 hourly in combination with Flucloxacillin 25 mg/kg body weight I.V, 6 hourly for 7 days and then orally for a total of 4 weeks.

Further treatment should be influenced by results of culture and sensitivity. In case of salmonella being identified then give:

Ciprofloxacin 500 mg once a day for 21 days

In chronic osteomyelitis: surgery may be indicated. In all cases of osteomyelitis, pain should be treated with an adequate analgesic e.g. Paracetamol 1g, oral, 6 hourly or in severe cases even Tramadol 50-100mg, oral, twice daily for 3 to 5 days.

Advice:

- Compound fractures are particularly vulnerable to infection so prophylactic antibiotics are advisable to prevent infections to the bones.
**Prevention:**
• Early effective treatment of traumatic injuries, pathological fractures.

**Referral Criteria:**
• For early drainage by orthopaedic surgeon.
• If pyrexia persists inspite of adequate antibiotic therapy, a subperiosteal abscess must be looked for and drained by an orthopaedic surgeon.
• Chronic osteomeolitis

**10.2 Irritable Hip**

*Description/clinical features:*
This is a self – limiting condition that sometimes affects children. Symptoms include pain and limping it usually resolves after 2 – 6 week

*Non drug treatment:*
• There is no specific treatment.
• Analgesics may be required initially, and when necessary.
• The hip should be rested as much as possible, but the patient should not be confined to bed.

*Advice:*
• Reassure the parents that the condition will pass in few weeks.
• Avoid long standing and walking

**10.3 Bone fracture and dislocation**

*Description/clinical feature:*
These are common conditions usually resulting from significant trauma, eg falling from a tree or a road accident. The patient usually presents with a painful, tender, swollen, deformed joint or limb that has reduced function.

*Non drug treatment:*
1. Stabilise the fracture or dislocation. Apply a splint to the site.
2. Immobilise the joint above and joint below the injury.
3. Use a sling for the upper limb and splints for the lower limb.

*Drug treatment:*
Give analgesics for pain: Diclofenac sodium 75 mg, I.M, stat.
Give antibiotics for compound fractures as a prophylaxis.
Apply Plaster of Paris (POP) or Crepe bandage depending on severity.

**Advice:**
X-ray diagnostics before considering POP.

**Referral criteria:**
Refer complicated severe injuries to high level hospital.

### 10.4 Post – Trauma backache

**Description/clinical features:**
Injuries to the back are common. Fractures are uncommon, but may result from a fall or road accident. These cases should be managed very carefully – under Multiple Fracture. Back strains or bruises are more common.

**Drug Treatment:**
Give analgesia for pain:

- **Adults:** Diclofenac sodium 50-100mg, oral, 8 hourly for 3-7 days.
- **Or**
  Diclofenac sodium injection 75 mg stat

**Advice:**
- Rest as much as possible, lying flat on the back.
- No lifting of heavy weights.
- Advise the patient to return if complications develop, eg. Blood in the urine, weakness / numbness or tingling in the legs

**Note:**
- Handle the patient with care
- Avoid unnecessary movement
- Lie the patient on fracture board on his back and use sand bags to avoid movements

**Referral criteria:**
- Failure to respond to conservative treatment.
- Development of any neurological symptoms / signs, eg. Numbness, tingling, weakness, paralysis
10.5 **Rheumatoid Arthritis**

**Description/clinical features:**
Chronic inflammation of joints of unknown etiology marked by pain, heat, redness and swelling.

**Non drug treatment:**
The primary outcome is to improve and maintain functional status of the joints.
The early use of nursing, physiotherapy and occupational therapy is essential.
In Acute flare-ups rest the affected joints and consider the use of day and night splints.

**Drug treatment:**

**Adults:**
- Acetyl salicylic Acid 600mg, oral, 6 hourly, with food.

**Or**
- Diclofenac sodium 50 mg, oral, 8 hourly.

<table>
<thead>
<tr>
<th>Caution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep on minimum possible dose to control symptoms.</td>
</tr>
<tr>
<td>Children under 12 years should not be given Acetyl salicylic Acid.</td>
</tr>
</tbody>
</table>

**Children:**

**1-12 years:** Diclofenac sodium 1-3mg/kg daily in divided doses.

**Advice:**
- Avoid use of alcohol
- Return if side effects of Acetyl salicylic acid develop, or condition worsens.

**Referral criteria:**
- Severe pain, swelling or many joints effected.
- Failure to respond to above treatment.

10.6 **Gout**

**Description/ Clinical features:**
Gout is a recurrent acute arthritis of peripheral joints which results from deposition, in and about the joints and tendons, of crystals of monosodium urate from supersaturated hyperuricaemic body fluids.
The arthritis may become chronic and deforming. The main clinical features are those of an acute gouty arthritis, often nocturnal, throbbing crushing or excruciating. The signs resemble an acute infection with swelling, hot red and very tender joints. The first metatarsophalangeal joint of the big toe is frequently involved.

Non drug treatment:
- Weight loss (if overweight)
- Reduction of Alcohol
- Avoidance of certain foods and drinks that may induce Gout
- Increase fluid intake (around 2 – 3 lts per day)
- Withdrawal of medicines that may precipitate Gout (e.g. Thiazide diuretics)

Drug treatment:
Specific treatment for acute Attack
Give any NSAID high dose such as Diclofenac 75 mg, oral start, then 50 mg, 8 hourly until 24 hours after relief of pain. Reduce dose to 50 mg, 8 hourly for 3 doses then 25 mg, 8 hourly for three doses
Alternatively, give Ibuprofen 400 – 800 mg, 8 hourly. Continue as long as necessary.

Advice:
- Institute prophylactic Diclofenac
- In obese patient, reduce weight
- Avoid precipitants e.g. alcohol
- Institute Anti-hyperuricaemic therapy e.g. Allopurinol 100 mg, 8 hourly to reduce Uric acid synthesis.
- Prevention or reversal of deposition of uric acid crystals by use of Allopurinol and dietary measures.
- Aim is to maintain serum Uric acid level below 8 mg/dl (0.48 mmol/1).

Chronic gout
Give Allupurinol 100mg daily increasing weekly by 100mg to 400 mg daily, the mean dose is 300mg.

10.7 Osteoarthritis
Description/ Clinical features:
Common form of arthritis, characterized by degenerative loss of articular cartilage, subchondral bony sclerosis, and cartilage and bone proliferation subsequent osteophyte formation. Causes unknown, but genetic, metabolic and biomechanical have been suggested. Gradual
onset of one or a few joints involved. Pain is the commonest symptom. Specific clinical features depend on the joint involved e.g. enlargement of distal interphalangeal joint (Bouchard's nodes)

**Non drug treatment:**
- Rest the joint Use crutches or walkers to protect weight bearing joints in severe cases.
- Reduction of weight in obese patients
- Physiotherapy – exercise to the affected joints

**Drug treatment:**
Acetylsalicylic acid 900mg, oral, 6 hourly with food  
**Or**  
Diclofenac 50mg, oral, 8 hourly

**Note:**  
In severe cases surgery may be indicated e.g. hip joint replacement
CHAPTER

11

11.0 NEUROLOGICAL DISORDERS

11.1 Headache

Description/clinical features:
Headache is a symptom of other diseases e.g. Malaria and high blood pressure, Migraine, Psychological stress etc.

Non drug treatment:
• Rest the patient and rule out the cause.

Drug treatment:
Adults: Paracetamol 1g, oral, 4–6 hourly for 3-5 days
Children: Paracetamol 12.5mg/kg, 6 hourly for 1-2 days
Alternative is Acetyl salicylic acid

Caution: Acetyl salicylic acid is not recommended for children under 12 years or peptic ulcer patients.

Referral criteria:
Refer if headache does not improve with treatment above, gets worse or new symptoms develop e.g. (fever, fits, visual disturbance, drowsiness etc) or localizes to one part of the head.

11.2 Migraine

Description/clinical features:
Episodic headache, usually focal in nature which may occur with or without an aura in the majority of cases (80% of cases) usually accompanied by nausea and vomiting.

Non drug treatment:
• Rest to reduce stress and tension.
• Reassure the patient on the nature of the condition.
• Attempt to identify food allergy.
**Drug treatment:**

**Adults:** Ergotamine 2mg stat, then 1mg, 8hourly for 5 days
(Maximum 4mg in 24 hours)

*Or*

Acetyl salicylic acid 600mg, oral, 4-6hourly for 3-4 days

**Children:** Paracetamol, oral, 12.5mg/kg, 6 hourly for 1-2 days.

**In case of Vomiting**

Metoclopramide 10mg, I.M, stat,

**Then**

Metoclopramide 10mg, oral, 8 hourly for 3 days.

**Caution:** Acetylsalicylic Acid should not be give for children under 12 years or peptic ulcer patients.

**Prevention:**

Avoid known precipitating stress and allergic substances.

**Referral criteria:**

Refer to high level hospital if the condition gets worse.

11.3 Concussion

**Description/clinical features:**

Head injury without loss of consciousness.

Headache is a common complication of head injuries. All patients with head injury should be examined carefully to exclude the signs of fracture of the skull. The headache, which may develop after a head injury, may last for many days or even some weeks.

**Non drug treatment:**

Observe the patient initially – first 6 hours, if stable send home do not give any analgesia.

Review regularly (every few days) until the headache resolves. Check carefully for the development of complications (see under advice).

**Drug treatment:**

If no unusual symptoms/signs and mild headache only, give analgesia

**Adults:** Paracetamol 1g, oral, 6 hourly for 3-4 days.

**Children:** Paracetamol oral 12.5mg/kg, 6hourly for 1-2 days
Advice:
Give the relatives careful instructions to return immediately if any unusual symptoms/signs appear:
• fits
• Reduction or loss of consciousness
• Increasing headache
• Disturbed vision or hearing
• Numbness/tingling or weakness of face, arms or legs.

Referral criteria:
Refer urgently if any unusual signs or symptoms develop.

11.4 Meningitis
Description/clinical features:
Meningitis is an inflammation of the membranes of the brain or spinal cord. It is commonly caused by bacteria, viral or parasites such as *Streptococcus pneumoniae* (pneumonial meningitis), *Hemophilus influenza* (influenza meningitis) and *Neisseria meningitis* (meningococcal meningitis) or Trypanosomiasis.
The disease is characterized by an intense headache, fever, intolerance to light and sound and rigidity of muscles, especially those in the neck. Also the disease causes acute confusional state where all mental functions are reduced especially alertness, attentiveness and the ability to grasp the more immediate situation.

Reactions are slow and indecisive, and the patient sleeps long hours. There is a marked disturbance of perception. As the confusion deepens stupor and coma follows.
In infants under 1 year diagnosis is much more difficult therefore always think of:
• Refusal to eat and or suckling, drowsiness and weak cry
• Focal or generalized convulsions
• Fever may be absent
• Irritability
• Infant may be hypotonic, neck is often not stiff
• Bulging fontanelle
Diagnosis requires lumbar puncture at a Hospital.

Non drug treatment:
Observe patient closely with regular monitoring of vital signs and neurological state.
Pay close attention to nutritional and hydration status.
Nurse patient in a quite, semi dark surrounding.
If unconscious, put in coma position and follow other general measures for unconscious patient.

**Drug treatment:**
Treat fits if present
**Give antibiotic.** Where the organism is not known.
Chloramphenical in combination with Benzyl penicillin are recommended.

**Adults:** Chloramphenicol 1g in combination with Benzyl penicillin 5MU, I.V, 6 hourly initially and after good clinical response (i.e. 48 hours after fever settles) continue with Ciproflaxin 500mg, oral, 12hourly for 5-10days.

**Children:** Chloramphenicol 25mg/kg body weight **in combination** with Benzyl penicillin give 25,000 IU/kg body weight, 6 hourly initially I.V, and after a good clinical response give orally.
Amoxacillin 50-100 mg/kg body weight, oral, in dived dose every 8 hourly for 5 days.

**If the patient has convulsions:**
Give Diazepam 0.25-0.5 mg/kg body weight by slow I.V until control is achieved.

Where the **organism** is known the following is advised:

- **Meningococcal meningitis and Pneumococcal meningitis**
  **Adults:** Benzyl Penicillin 5 MU every 6 hours I.V initially until good clinical.
  **Or**
  Chloramphenicol 1g, I.V, 6 hourly and after good clinical response change to Ciproflaxin 500mg, oral, 12hourly for 5-10days.

  **Children:** Benzyl penicillin 25,000 IU/kg body weight, 6 hourly for 10 days
  **Or**
  Chloramphenicol 25 mg/kg weight, 6 hourly for 10 days

**General measures:**
- Observe patient closely with regular monitoring of vital signs and neurological state.
- Pay close attention to nutritional and hydration status.
- Nurse patient in a quite, surrounding.
- If unconscious, put in coma position and follow other general measures for unconscious patient.
11.4.1 Influenza meningitis

First choice:
- **Adults**: Chloramphenicol 1g, I.V, 6 hourly and after good clinical response change to Ciprofloxacin, oral, 500mg, 12 hourly for 10 days.
- **Infants under 2 weeks**: Chloramphenicol 6mg/kg body weight, 6 hourly, intravenously. (Neonates require treatment for 3 weeks).
- **Children**: Chloramphenicol, I.V, 50-100 mg/kg body weight, 6 hourly in divided doses for 10 days.

Second choice:
- **Adult**: Ceftriaxone: 1 g, I.V daily, up to 2-4 g daily in severe infection
- **Children**: 20-50 mg /Kg body weight daily, up to 80mg/kg in severe infection.

Advice:
Any child with convulsion and fever who have proved negative for other causes lumber puncture should be done to exclude meningitis.

Prevention:
Health care staffs and close house relatives who have had contact with patients before treatment for 24 hours should receive prophylaxis: Ciprofloxacin 500mg, oral, immediately as a single dose.

Referral criteria:
Failure to respond to treatment, refer the patient to high level hospital.

11.4.2 Cryptococcal Meningitis

Description/Clinical Features:
It is chronic Meningitis caused by Cryptococcal neoformans. It develops in patients who are immunocompromised e.g. patients with HIV having low CD count.
The disease is characterized by headache, (in 75%), fever (in 65%), intolerance to light and sound and rigidity of muscles, especially those in the neck, vomiting, seizures, deafness and blindness. In advanced stages in addition to exacerbation of mentioned features, the disease causes confusional state where all mental functions are reduced especially alertness, attentiveness and the ability to grasp the more immediate situation. Reactions are slow and indecisive, and the patient sleeps long hours. There is a marked disturbance of perception. As the confusion deepens, stupor and coma ensure.
**Drug Treatment:**  
Fluconazole, oral, 400 – 800 mg/day for 6 – 10 weeks, then 200 mg/day  
Alternative Treatment  
Amphotericin B, 0.7 – 1 mg/kg/day by slow infusion I.V for 2 weeks  
**And**  
Flucytocine, 25 mg/kg, I.V, 6 hourly for 14 days

11.5 Febrile fits  
**Description/clinical features:**  
This is a fairly common complication of fever (above 38.5°C) in children 3 months to 5 years. Viral and bacterial infections are often the cause. Many times, the fits last only for a few minutes and will have stopped by the time the child reaches the clinic.

**Non drug treatment:**  
Ensure the airway is clear.  
Position the child on his/her side.  
Treat the fever (i.e. remove clothing, fanning).

**Drug treatment:**  
**First choice:**  
Most febrile fits are self-limiting and do not require treatment with anticonvulsants.

For prolonged fits (more than 10 minutes):  
**Children:** Diazepam 0.15 - 3mg/kg slowly, I.V, or 0.5 – 1 g/kg per rectum if I.V not possible.

**Caution:**  
IV diazepam may cause low blood pressure and or respiratory arrest. Treat the underling cause of the fever with Paracetamol

**Second Choice:**  
Phenobarbitone 10 – 15mg/kg stat I.V, repeat with 5mg/kg after 20 minutes if convulsions have not stopped.  
**Or**  
Phenobarbitone 15 – 20mg/kg stat I.M, repeat with 5mg/kg after 20 minutes if convulsions have not stopped.
Advice:
Patients should return to hospital immediately if it reoccurs
The parent should manage the fever at home (i.e. remove clothing, fanning).

Referral criteria:
If fits persists even after the above treatment, refer to high level hospital urgently.

11.6 Epilepsy
Description/clinical features:
Epilepsies are disorders of the central nervous system (CNS) which are characterized by chronic spontaneous recurring seizures.

Non drug treatment:
Maintain clear airway and protect tongue bite
Position the patient on his/her side – to avoid aspiration.
Monitor vital signs carefully.

11.6.1 Partial seizures or generalized tonic clonic seizures
Drug treatment:
First choice:
Control seizures (for prolonged fits more than 10 minutes)
Diazepam, I.V, 0.15 - 3mg/kg body weight slowly or 0.5 – 1 g/kg body weight per rectum if I.V not possible.
Or
Phenobarbitone, I.V, 10 -15 mg/kg body weight stat
Or
Phenobarbitone, I.M, 15 – 20mg/kg body weight repeats with 5mg/kg body weight after 20 minutes if convulsions have not stopped.

The choice between the therapeutic agents must be made on the acceptability of side effect and how the number of doses influences life style.

Adults: Carbamazapine 200mg, oral, 12hourly for the first 2 weeks, then 300mg, 12 hourly, increase at fortnightly interval to a maximum dose 600mg, 12 hourly daily as required.

Children:
Up to 1 year: 100-200mg, 8 hourly.
1-5 years: 200-400mg, 8 hourly.
5-10 years: 600- 1000mg, 8 hourly.
Second choice:  
Adults: Sodium valproate 200 - 300mg, oral, 12 hourly, then increase as required every 2weeks to a maximum dose of 1200mg, 12 hourly daily.
Children up to 20kgs: Sodium Valproate 10mg/kg, oral, 12 hourly, then increase up to 20mg /kg 12 hourly.
Children above 20kgs: Initially Sodium Valproate 200mg, oral, 12 hourly. Increase to 30mg/kg according to response.

Note: Phenobarbitone orally 30-90mg daily in single or in divided doses or Phenytoin Sodium orally 100-300mg in single or divided doses can still be used in those areas where the better (but more expensive) anticonvulsants cannot be obtained). Appropriate lower doses should be used for children)

Prevention:  
Avoid birth trauma.  
Monitor children with frequent episode of febrile seizures.
Advice:  
Counseling on:  
• The adverse effect of alcohol on seizures  
• Effect of missing a dose of medication  
• Discontinuing the drug without advice of the Doctor.

Referral criteria:  
Refer to high level hospital if seizures persist.

11.6.2 Status Epilepticus  
Description/clinical features:  
Persistent seizures without regaining consciousness.

Non drug treatment:  
Maintain cardio respiratory status.

Drug treatment:  
First choice:  
Control seizures within 60minutes to prevent permanent brain damage by:
Adults: Inj. Diazepam, I.V, 10-20mg slowly stat.
Then  
Inj. Phenytoin, I.V, 20mg/kg diluted in sodium chloride 0.9 % (and not
dextrose) administered not faster than 50mg/minute preferably with cardiac monitoring. 

**Children:** Diazepam, I.V, 5mg/minutes, dose 0.25mg/kg bwt.

**Caution:**
- If arrhythmias occur, interrupt the infusion temporarily and re-introduce slowly.
- If there is no venous access, give same dose orally or via nasogastric tube. Flush the tube after administering phenytoin

**Second choice:**
**If seizures continue after 30 minutes**
Intubate and ventilate patient.
- Thiopental sodium, I.V, 2-4mg/kg, followed by 50mg bolus every 2-3 minutes to control seizures.
- Maintenance dose: 1-5mg/kg/hour

**Caution:**
- Be aware of hypotension
- Once seizures controlled for 24 hours wean off Thiopental sodium by decreasing dose by 1mg/kg, 12 hourly.

**Maintenance therapy:**
- If seizure controlled
- First maintenance dose should be no more than 12 hours after the loading dose.
- Phenytoin 100mg, I.V, 8 hourly or 300mg daily.

**11.7 Tetanus**
THIS IS A NOTIFIABLE DISEASE.
**Description/clinical features:**
Tetanus is a medical condition that is characterized by a prolonged contraction of skeletal muscle fibers. The primary symptoms are caused by tetanospasmin, a neurotoxin produced by the Gram-positive, obligate anaerobic 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 difficult in swallowing general muscle stiffness and spasms in other parts of the body. In the case of neonates, infection is through the umbilical stump, it results in tetanus neonatorum.
**Non drug treatment:**
- Admit in Intensive Care Unit if available.
- Ensure adequate ventilation and relaxation.
- Monitor ECG and blood pressure.
- Protect the patient from all unnecessary sensory and other stimuli.
- Provide nutrition, fluids and intensive nursing care
- Wound management is essential with debridement and removal of any foreign bodies.

**Drug treatment:**

For rigidity, spasms:
- Diazepam 10 mg, I.V, 4 hourly, for 24 hours, then consider oral route
  Titrate to effect doses as high as 50–100 mg, 2 hourly is sometimes used.
Where muscle relaxation is required:
- Alcuronium 10 mg/2 ml, I.V, as needed, this may exacerbate autonomic instability.
To eradicate bacteria:
- Benzylpenicillin (Penicillin G) 5 MU, I.V, 6 hourly for 10 days

For passive immunisation:
- Tetanus immunoglobulin, human 3 000 units, I.M, as a single dose

For active immunisation of all patients as clinical tetanus does not always confer immunity:
- Tetanus toxoid vaccine 0.5 ml, I.M, total of 3 doses:
  on admission
  at 4 weeks
  at 6 months

For fever give:
- Paracetamol 1 g, oral, 6 hourly

For shock and dehydration, maintain hydration:
- I.V fluids, plasma volume expanders

As prophylaxis for deep vein thrombosis:
- Heparin, S.C, 5 000 units, 8 hourly to alleviate pain.
- Morphine, slow I.V, 10 mg up to 10 mL with sodium chloride 0.9% administered over 45 minutes, repeat after 4–6 hours.

**Note:**
Surgical toilet must be done at least 1 hour after the injection of antitoxin.
Prevention:
Any patients who had cut wound and had not been immunized or has incomplete immunization should be given anti Tetanus serum 150000 I.U subcutaneous.
Active immunization to pregnant mothers.
Children under five years of age should be immunized (DPT and Hepatitis B).

Referral criteria:
All cases to a facility with resources for artificial ventilation

11.8 Rabies

Description/clinical features:
Rabies is an acute viral disease of the central nervous system that affects animals and transmitted to man through infected secretions, usually bites or contamination of mucosa or skin lesion.
Early or prodromal clinical features of the disease include apprehensiveness, restlessness, fever, malaise and headache. The late features of the disease are excessive motor activity and agitation, confusion, hallucinations, excessive salivation, convulsions and hydrophobia. Death is considered the invariable outcome.

Non drug treatment:
Wash the wound thoroughly with water and soap; cover the wound with clean cloth.

Drug treatment:
- Local wound therapy
  Wash wound thoroughly with water and soap and repeat process with 1% Cetrimide solution or apply tincture iodine.
- Active immunization
  Human Diploid Cell Vaccine (HDCV): give 1 ml, I.M, as soon as possible after exposure. Subsequent doses of HDCV are given on days 3, 7, 14, 21, 28 and 90.
  • Tetanus toxoid vaccine: give 0.5 ml I.M on days: 1 month and 6-12 months.

Adults: Procaine penicillin 1.2 MU, I.M, daily for 5 days, if patient is sensitive to penicillin, give Erythromycin 500mg, 8 hourly for 5 days

Advice:
Rabies is a notifiable condition: inform veterinarian officials and District Health Management Team.
**Prevention:**

* Passive immunization

Anti rabies human immunoglobulin:
Give by careful instillation in the depth and around the wound (dose 20 IU/kg body weight half the dose given parent rally and the Other half injected into and around the wound)

* Children Procaine Penicillin 0.4 – 0.8 MU, I.M, every 24 hours for 5 days. If patient is sensitive to penicillin, give Erythromycin, oral, 10mg/kg body weight, 6 hourly for 5 days

**Referral criteria:**
All cases.
12.0 MALIGNANT DISEASE CONDITION

12.1 Hepatoma – Hepatocellular Carcinoma (HCC)

Description/clinical features:
Is a malignant neoplasm of the liver, which may occur either with or without accompanying hepatic cirrhosis. There is a strong association of this cancer and hepatitis B infection.
Clinical features of the condition include a history of right upper abdominal pain often associated with weight loss and fever. There may be considerable abdominal swelling due to liver enlargement with or without ascites.
Weight loss approximately 50% weight loss, anorexia, fever, fever and pain in the right hypochondria, ascites or exam enlarged irregular tender liver.

Non drug treatment:
Discourage the use of alcohol and other intoxicants.
Supportive Psychotherapy.

Drug treatment:
First choice:
General supportive measures:
Adults: Tabs.Diclofenac 50mg, 8hourly.
Or
Tabs.Ibuprofen 400-600mg, 6 - 8 hourly.

Infants and Children:
Over 7kg: Syrup.Ibuprofen 20-30mg/kg
1-2 years: 50mg, 4 hourly
3-7 years: 100mg, 4 hourly
8-12 years: 200mg, 4 hourly
Note: Should be taken after meal

Second choice:
Adults: Pethidine 100mg I.M or Subcutaneous 4hourly
Or
25-50mg I.V, 4 – 8 hourly
If pain persists, use Morphine 10mg, 4 hourly if necessary
Children:
Under 1 year: Pethidine 150 microgram I.M or subcutaneous, 4-8 hourly
1-5 years: Pethidine 2.5-5mg I.M or subcutaneous repeated after 4-8 hours if necessary.
6-12 years: Pethidine 5-10mg I.M or subcutaneous (S.C), 4-8 hourly

Prevention:
• Haemocromatosis – deposition of iron from local alcohol.

Referral criteria
Refer severe cases.

12.2 Cancer of the Cervix
Description/clinical features:
It is the most common Cancer in women, where the etiology is unknown, identified predisposing factors includes, human papiloma virus infection. There is abnormal vaginal bleeding or vaginal discharge associated with contact e.g. sexual intercourse

Drug treatment:
First choice:
Stage 1a: Cancer of the cervix is best treated by total hysterectomy and/or radiotherapy.
Stage 1b: and above are primarily treated with radiotherapy.

Prevention:
• Health lifestyle and environment can help to prevent cancer (e.g. Avoid tobacco, eating right, being active, and maintaining a healthy weight)
• Early detection

Referral criteria:
Refer all vaginal bleeding urgently to the referral Hospital or to Tumour Centre.
12.3 Breast Cancer

*Description/clinical features:*
It is a malignant tumor of the glandular tissue of the breast.
A solitary lump in the breast must be regarded as breast cancer until proven otherwise. Hardness, attachments to skin or deeper tissues, skin ulceration, nipple retraction or presence of auxiliary lymphadenopathy are features pointing towards malignancy.

*Drug treatment:*

*First choice:*
- First stage: Total mastectomy and radiotherapy in some cases. In advanced diseases palliation may be all that can be offered

*Advice:*
- All women in childbearing age and those using contraceptives must learn self-breast examination and should be examined at least once in a six-month or yearly at the hospital.

*Prevention:*
- Early detection and referral to the Referral Hospital

12.4 Kaposi’s Sarcoma

*Description/clinical features:*
It is a malignant tumor of angio-formative cells usually starting from the skin but occasionally involving many other organs of the body. There are three epidemiological variants—sporadic, endemic and epidemic form, which is associated with infection of human immunodeficiency virus (HIV).
It is present as firm-dark-brown nodules or plaque in the skin, usually on the limbs and buccal cavity and swelling of the lower limbs (significant Oedema). In young children those with immunodeficiency, wide spread lymphadenopathy with or without skin lesions occur.

*Drug treatment:*

*First choice:*
Mainstay of treatment is Radiotherapy, where Radiotherapy is not available combination chemotherapy may be given.
Treat underline course.
Advice:
Counseling on HIV test is needed to those people with Kaposi’s sarcoma

Prevention:
Early detection and counseling

Referral criteria:
Referral to HIV Clinic

12.5 Leukemia
Description/clinical features:
The leukemia is a heterogeneous group of neoplasm arising from malignant transformation of the haematopoietic cells. Is characterized by proliferation of immature white blood cells in the peripheral blood or after aspiration of bone marrow. Common symptoms and signs are anaemia, bleeding from the gum, splenomegally and on hepatomegally. Thrombocytopenia acute infection of mouth ulceration, sore throat painful and enlarged, lymphadenopathy, malaise and joint pain. Causes are unknown for both types (Acute lymphoblastic and acute myeloblastic leukemia)

Drug treatment:
First choice:
Early detection and referral to the referral hospital. Treatment with chemotherapy may be useful in some types of leukemias.

Prevention:
Avoid unnecessary exposure to the radiation.

12.6 Burkitt’s Tumour (African Jaw Tumour)
Description/clinical features:
Burkitt’s tumour is an undifferentiated lymphoblastic lymphoma. It shows close association and infection with the Epstein Barr virus. The endemic form of Burkitt’s lymphoma is characterized by rapid enlargement of the patient’s jaw, loosening of the teeth, protruding eyeballs, or an abdominal tumor in the region of the kidneys or ovaries.

In the sporadic form of Burkitt’s, the patient may have a facial tumor but is much more likely to have an abdominal swelling, often in the area of the ileocecal valve (the valve between the lower portion of the
small intestine and the beginning of the large intestine). About 90% of children with Burkitt’s have abdominal tumors. Others may develop tumors in the testes, ovaries, skin, nasal sinuses, or lymph nodes. In adults, Burkitt’s lymphoma frequently produces a bulky abdomen and may involve the liver, spleen, and bone marrow.

In Zanzibar common areas are North Unguja and North Pemba.

**Drug treatment:**

**Adults:** Cyclophosphamide, oral, 1 - 5 mg/kg body weight, once a day for initial and maintenance dose.

**Or**

Injection Cyclophosphamide, Doxorubicin, Vincristine these combinations is given every three weeks for three to six circles, 40-50mg/kg, divided in several smaller doses, for 2 to 5 days. The dose for patients receiving bone marrow transplant may be as high as 60 mg/kg per day for 2 days

**Prevention:**

Early detection and referral
13.1 Gonorrhoea

Description/clinical features:
It is sexually transmitted diseases usually present with penile discharge in Men, Women may have a vaginal discharge, but often have no symptoms.

Drug treatment
Uncomplicated infection
Adult: Ceftriaxone 0.5-1g, I.M, 12 hourly for 7 days, in severe infection 2-4gm daily.
Infant and Children: Ceftriaxone, I.M, 20-60mg/kg body weight daily in two divide dose.
Or
Spectinomycin 2g, I.M, as a single dose twice daily for 7 days
Or
Ciprofloxacin 500 mg, oral, as a single dose twice daily for 7 days
Or
Metronidazole 400mg, oral, 8 hourly
Plus
Doxycycline 100mg, oral, 12 hourly for 7 days.

Caution:
Ciprofloxacin is contraindicated in pregnancy and is not recommended for use in children and adolescents.

Advice:
• Partner must be treated.
• Abstain from intercourse for one week.

Prevention:
• Patients with gonorrhea should be assessed for other sexually transmitted infection such as syphilis and HIV.
• In a pregnant mother close to delivery, ensure the newborn is checked and treated for gonococci eye infection
• Avoid casual sex.
• Avoid multiple sexual partners.
• Use condoms

Referral Criteria:
• Refer if symptoms last more than 3 days after starting treatment

13.1.1 Complicated Gonorrhoea
Description/clinical features:
Usually occurs in women and most commonly presents as pelvic inflammatory disease (PID), in men presents as infection of the testicle and tube (epididymo-orchitis).

Drug treatment:
Ceftriaxone 2-4g, I.M once a day for 7 days
Or
Spectinomycin 2g, I.M twice a day for 7 days

13.2 Ophthalmia Neonatorum
Description/clinical features:
Inflammation of the conjunctiva of a newborn from 0-28 days. Potentially sight threatening condition. The most important sexually transmitted pathogens which cause the disease are Neisseria gonorrhoea and Chlamydia trachomatis. Other non – STI causes of neonatal conjunctivitis include: Staphylococcus aureus, Streptococcus pneumoniae, Haemophilus and Pseudomonas ssp, viral, chemical and physical irritation. Common symptoms and sign of Neonatal conjunctivitis Reddish conjunctiva, Oedema/swelling of the eyelids, purulent eye discharge

Non drug treatment:
The infant’s eyes should be carefully cleaned immediately after birth. This is preventable with timely eye prophylaxis

Drug treatment:
First choice:
1% Tetracycline eye ointment
0.3% Gentamycin eye drop 1-2 hourly for 7-10 days.
Syrup. Amoxycillin 2.5- 5mls, 8 hourly for 5 days.
Second choice:
0.5% Erythromycin eye ointment
Cetriaxone 50 mg /kg, I.M, as a single dose to a maximum of 75mg

Prevention:
• Screening of pregnant women
• Early treatment of vaginal discharge syndrome
• Routine eye prophylaxis in the neonate by providing

Advice:
• Partner must be treated
• Health education on Hygiene

Referral criteria:
Refer the severe cases to the tertiary centre urgent.

13.3 Genital ulcers
Description/clinical features:
There are several diseases that can cause genital ulcers. These include:
• Genital herpes (many small painful shallow ulcers)
• Chancroid (pain ulcers)
• Syphilis (single painless ulcer)

Non drug treatment:
• Avoid casual sex.
• Avoid multiple sexual partners.
• Improve personal hygiene.

Drug treatment:
Treat underline cause

Advice:
• This is crucial, especially when patients are reluctant to be referred, be sure to emphasize confidentiality to ensure compliance.

Prevention:
• As for gonorrhoea
• Use condoms

Referral criteria:
• Refer all cases (and their sexual contacts) for investigation and treatment.
13.4 Syphilis

**Description/clinical features:**
Syphilis is a chronic infectious disease caused by the spirochete *treponema pallidum*. It can be acquired mainly through sexual intercourse, congenitally when the mother transfers it to the Fetus or direct contact infected tissue, blood or contaminated fomites. This condition usually presents in its primary stage as a single painless genital ulcer. Men usually notice the ulcer, but it may go undetected in women. The ulcer disappears after about 6 weeks.

## Table 1: Classification of Syphilis.

<table>
<thead>
<tr>
<th>Type</th>
<th>Stage</th>
<th>Clinical features/presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital</td>
<td>Early</td>
<td>Rhinitis with blood nasal discharge</td>
</tr>
<tr>
<td></td>
<td>late</td>
<td>Mucocutaneous lesions e.g. bullae, stigmata of osteochondritis, osteitis (or scars)</td>
</tr>
<tr>
<td>Acquired</td>
<td>Early Primary and Secondary syphilis</td>
<td>• A painless chancre&lt;br&gt;• Rash&lt;br&gt;Non – tender lymphadenopathy, condylomata accumilata.</td>
</tr>
<tr>
<td></td>
<td>Late tertiary (beginning gummatous)</td>
<td>Interstitial keratitis, photophobia, corneal infection, 8th cranial nerve deafness, bilateral knee effusion, recurrent arthropathy.</td>
</tr>
<tr>
<td></td>
<td>Quarterly (cardiovascular and neurosyphilis)</td>
<td>Cardiovascular syphilis and neurosyphilis will give clinical features associated with that system. Also seen are gumma and osteitis.</td>
</tr>
</tbody>
</table>
**Prevention:**
- As for gonorrhea
- Use condoms
- Avoid sharing the towels or clothes.

**Drug treatment:**
**For primary and secondary syphilis:**
Benzathine penicillin 2.4 IU, I.M, as a single dose given as two injections at separate sites
If there is penicillin allergy give:
Doxycycline 100mg, oral, 12 hourly for 15 days.

**Caution:**
Doxycycline should not be given to the pregnant and lactating women and children under 12 years of age.

**For late Syphilis:**
Benzathine penicillin 2.4 IU, I.M, weekly for 3 weeks.
- Congenital syphilis:
**Up to 2 years of age:**
Aqueous Benzyl Penicillin 100,000-150,000 IU/kg body weight per day administered as 50,000 -75,000 IU/kg, I.V, 12 hourly, during the first 7 days of life and 8 hourly thereafter for a total of 10 days.
**Or**
Procaine benzyl penicillin 50,000 IU/kg body weight, once a day for 10 days
**Above 2 years of age:**
Benzyl penicillin 200,000-300,000 IU/kg body weight I.V or IM administered as 50,000 IU/kg, 4- 6 hourly for 10-14 days
**Or**
Erythromycin 7.5- 12.5 mg/kg body weight, 6 hourly for 30 days

**Advice:**
- Partner must be treated
- Health education on Hygiene

**Prevention:**
- As for gonorrhea
- Use condoms
- Avoid sharing the towels or clothes
Referral criteria:
• Refer all cases for further investigation.

13.5 Genital warts
Description/clinical features:
Superficial muco-cutaneous infection caused by human Papilloma viruses infecting the skin or mucous membrane. The common sites affected by warts include genital region (condylomata acuminata) hands and legs. The lesions are usually asymptomatic fleshy growths. In the genital region, lesions are often finger like and increase in number and size with time. When extensive they may interfere with sexual intercourse and child birth. The removal of the lesion does not mean cure of the infection.
No treatment is completely satisfactory.

Non drug treatment:
Cryotherapy (technique that uses an extremely cold liquid or instrument to freeze and destroy abnormal skin cells that require removal).
Patients with anogenital warts should be checked for the presence of other STIs.

Drug treatment:
Carefully apply either 10-25% Podophyllin or Silver Nitrate to the warts, and wash off in 6 hours, drying thoroughly. Treat every 2-3 days until warts are gone. Contraindicated in pregnancy/lactation.

Note: Do not apply on healthy surrounding skin.

5% Imiquimod cream applied with a finger at bedtime, left on overnight, 3 times a week for as long as 16 weeks. (The treatment area should be washed with soap and water 6-10 hours after application).
Surgery may be useful in selected cases to remove the warts.

13.6 Cervical warts
Description/clinical features:
This case should be referred to consultant/expert. Most expert advice against the use of podophyllin for cervical warts. One of the alternative treatments mentioned above should therefore be used.

Management of Meatal and urethral warts
Accessible meatal warts may be treated with podophyllin or povidone-
iodine solution. Great care is needed to ensure that the treated area is dried before contact with normal, opposing epithelial surface is allowed.

13.7 Trichomoniasis

**Description/clinical features:**
It is caused by a flagellate protozoa *Trichomonas vaginalis*. It causes inflammation of vagina and cervix in females and inflammation of urethra and prostate gland in males. Clinical features may or may not occur. When they do they include a frothy green/yellowish discharge, itchness, erosion of cervix.

**Drug treatment:**
- **Adults:** Metronidazole 2g, oral, single dose at bed time (avoid alcohol). Give the same treatment to partner.
- **Children:** 5mg/kg body weight, 8 hourly for 7 days

**Note:** In pregnancy treatment with Metronidazole should be delayed until after first trimester.
14.0 VIRAL INFECTIONS

14.1 Measles

This is a notifiable disease

Description/clinical features:
Measles is an acute infectious disease caused by a paramyxovirus which is spread by droplets. It usually occurs in children under five who have not been immunized or have been incompletely or unsuccessfully immunized. The main clinical features are indistinguishable from an upper respiratory tract infection i.e. fever, conjunctivitis with lacrimation, photophobia, cough and nasal discharge. Koplic spots are small red, irregular lesions appearing in the mouth 1-2 days before rash and are diagnostic of measles. Red maculopapular rash appearing first behind the ears and spreading to rest of body is a feature of the disease.

Drug Treatment:
Adults: Paracetamol 1g, 8 hourly for 5 days
Vitamin A 200,000 IU, oral, stat against vitamin A deficiency
Tetracycline eye ointment 1% apply once a day for 7 days
Children: Paracetamol 10mg/kg body weight, 8 hourly for 5 days.
Vitamin A if less than 1 year give 100,000 IU stat and if over 1 year give 200,000 I.U

Note: Give extra fluid and food

Prevention:
Vaccination of children at 9 months of age.
Advice:
Feed the child small meals frequently
Ensure all children in community have been vaccinated against measles.

Follow up:
Review if child has cough, diarrhoea or develops red eyes.
Check the weight after two weeks.

Referral criteria:
If the patient has severe complications.

14.2 Poliomyelitis
Description/clinical features:
Poliomyelitis is a disease caused by one of the three related polio viruses, types 1, 2 and 3 which comprise a subdivision of the groups of enteroviruses. Clinical features of the disease can be divided into three groups:
• Non-specific febrile illness of 2-3 days duration without CNS involvement.
• Aseptic meningitis include features mentioned above
• Paralytic poliomyelitis – which is the major possible outcome of the infection but occurs in less than 10% of those infected.

Non Drug Treatment:
Give supportive therapy

Prevention:
This disease is preventable by immunization with polio vaccine starting at birth. Give 4 doses at intervals of 4 weeks.
Parents should be told about the World program to eliminate Polio and the importance of actively participating.

14.3 Viral Hepatitis
Description/clinical features:
Viral hepatitis is a systemic infection predominantly affecting the liver. It is caused by the hepatitis viruses A, B, non-A, non-B and delta viruses (E). The clinical spectrum of the disease is variable. It ranges from asymptomatic and inapparent to fulminates and fatally
acute infections. Subclinical persistent infections with hepatitis virus B, non-A, and non-B, may progress to chronic liver disease, cirrhosis and possible hepatocellular carcinoma.

**Non Drug Treatment:**
Mainly supportive

**Prevention:**
Hepatitis B is preventable by immunization. Vaccines for other types should be made available.
Hepatitis A and B infection can also be prevented by protected sex.

**Advice:**
- Bed rest
- Give a lot of fluids

14.4 Mumps

**Description/clinical features:**
This is a viral infection caused by paramyso-virus, it occurs as epidemic.

**Drug Treatment:**
No specific. Treat pain/fever with Paracetamol.

**Prevention:**
Susceptible people should avoid contact with an open case.

**Advice:**
Give plenty of fluids during episodes of fever.
If eating is made difficult by pain, make sure enough soft, high energy foods are given.

**Follow up:**
If symptoms or signs of complication develop, i.e. high fever, severe headache, vomiting or pain in the testicles.

**Referral criteria:**
Signs of meningoencephalitis.
14.4.1 Mumps orchitis

**Description/clinical features:**
This may occur a few days after the swelling of the saliva glands. In a few cases the swelling of the glands may not have been noticed. The diagnosis will be suspected because there will be other cases of mumps.

**Drug Treatment:**
None specific. Give Paracetamol.

**Advice:**
Support the scrotum with a bandage.

**Follow up:**
The swelling should last 4 – 7 days. If it is still present after a week, or is increasing the patient should be brought back to the clinic for review.

**Referral criteria:**
Orchitis that is getting worse, or which has not gone away after one week.

14.5 Human Immunodeficiency Virus (HIV)

**Description/clinical features**
The spectrum of disease due to HIV infection ranges from mild, non-specific conditions (e.g. persistent generalized lymphadenopathy - PGL, herpes zoster, seborrheic aczema) to it’s sever form i.e. Acquired Immuno Deficiency Syndrome (AIDS). Infection by the human immunodeficiency virus lead to gradual and progressive destruction of the cell mediated immune system. The clinical features may be due to HIV per se or as a result of immune system destruction. Prolonged fever, diarrhoea, weight loss, skin rashes, sores, generalized pruritis, altered mental status, persistent severe headache, oral thrush or Kaposi’s sarcoma may be found in patients with advanced disease. Most patients, however, present with symptoms due to opportunistic infections (which are usually curable) e.g. tuberculosis, candidiasis or pyogenic infections.

**Treatment in adults and adolescents using Antiretroviral medicines (ARV)**
HIV positive patients should be referred to Care and Treatment Clinics. The initial management requires a complete work up of the patient.
A complete blood count, renal and hepatic chemical function tests, urine pregnancy test and viral load where applicable should be done at baseline.

Initiation of treatment should be based on the extent of clinical disease progression. CD4+ T lymphocytes counts remain the standard for evaluating immune function.

**Criteria for initiation for Antiretroviral therapy**

There are three classes of individual who are clinically eligible to begin treatment

- All who are in WHO stage 4 clinical criteria regardless of CD4+ cell count
- Those in WHO stage 3 and CD4+ cells less or equal to 350/mm cubed as an indicator of their progression to AIDS
- All who have a CD4+ count less or equal to 200 cell/mm cubed regardless of symptoms

**Clinical Criteria for ART in Adults and Adolescents**

Before initiating therapy in any patient, apart from clinical eligibility, it is important to assess the patient’s willingness, readiness and ability to be on ART adherently. In this regard, the following evaluation should be done:

- Laboratory tests which include complete blood count, chemistry profile (serum transaminases, creatinine and lipid profile) CD+T lymphocyte count
• Chest X-ray
• Hepatitis C serology
• Ophthalmology examination
• Educate patient and family members on HIV and AIDS
• Measure viral load (where possible)

**Drug Treatment:**
Antiretroviral therapy both in naïve patients and those who had received treatment before, involves the use of combination of drugs. The use of single drugs (monotherapy) in the treatment of HIV/AIDS is not recommended. It is recommended to use the following triple therapy consisting:

• 2 Nucleosides Reverse Transcriptase Inhibitors (**NRTI**) + 1 Non Nucleoside Reverse Transcriptase Inhibitors (**NNRTI**)

**Or**

• 2 Nucleosides Reverse Transcriptase Inhibitors (**NRTI**) + 1 Protease Inhibitors (**PI**)

**Note:** There is no single combination that is best for every patient and that can be tolerated by all. Therefore, treatment regiments should be based on patient’s clinical condition, lifestyle, and ability to tolerate the regimen.

**Treatment Regimen:**
**First line ARV combination regimen for adults and adolescents**
The following drug combinations can be made out of these drugs for adults and adolescents, and should be used according to indications and contraindications that govern the use of ARVs to minimize side effects and drug-drug interactions.

- Zidovudine (**AZT**) + Lamivudine (**3TC**) + Nevirapine (**NVP**)
- Zidovudine (**AZT**) + Lamivudine (**3TC**) + Efavirenz (**EFV**)
- Stavudine (**d4T**) + Lamivudine (**3TC**) + Nevirapine (**NVP**)
- Stavudine (**d4T**) + Lamivudine (**3TC**) + Efavirenz (**EFV**)
- Tenofovir (**TDF**) + Emtricitabine (**FTC**) + Efavirenz (**EFV**)
- Tenofovir (**TDF**) + Emtricitabine (**FTC**) + Nevirapine (**NVP**)
- Tenofovir (**TDF**) + Lamivudine (**3TC**) + Efavirenz (**EFV**)
- Tenofovir (**TDF**) + Lamivudine (**3TC**) + Nevirapine (**NVP**)

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**Note:**
The following drugs may appear in fixed drug combinations (FDC):

- **AZT+3TC**, e.g. Combivir or Duovir
- **AZT+3TC+NVP**, e.g. Duovir N
- **d4T+3TC+NVP**, e.g. Triomune
- **TDF+FTC+EFV**, e.g. Atripla
- **TDF+FTC**, e.g. Trivada

The default first line regimen is:
Zidovudine (**AZT**) 300mg/Lamivudine (**d4T**) 150mg, twice daily and Efavirenz (**EFV**) 600 mg once daily at night.
For women in the child bearing age, Nevirapine (**NVP**) 200mg twice a day is given instead of Efavirenz.

**Note:**
- For Adolescents, the dose of **AZT** is 200mg twice a day for a body weight of between 20-40kgs.
- For patients with <40kg, the dose of **EFV** should be <600 mg.
- Efavirenz has been reported to be associated with teratogenicity in early pregnancy. In this case, Nevirapine should be prescribed instead.
- In women for whom effective contraception can be assured, **EFV** remains a viable option for the NNRTI component of the regimen.

Recommended First line drug regime
Under certain circumstances however, the following regimens can be used as first line:

- **Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP)**
  This regimen can be prescribed when Efavirenz is contraindicated, such as in Neuropsychiatric complications of Efavirenz and pregnancy or when stavudine can not be used such as in the presence of peripheral neuropathy.

  **Note:**
  Nevirapine challenge dosing is required during the beginning of treatment. In the first two weeks of treatment only half of the required daily dose of Nevirapine should be given, and a full dose if there are no side effects such as skin rash or hepatic toxicity. (Repeat alternative at two weeks). In summary, this means:
  (Zidovudine 300mg/Lamivudine 150mg/Nevirapine 200mg in the morning + Zidovudine 300 mg/Lamivudine 150 mg once in the evening for the first 2 weeks. And if there are no problems, THEN Zidovudine 300 mg/Lamivudine 150 mg/Nevirapine 200 mg twice daily).

- **Stavudine (d4T) + Lamivudine (3TC) + Efavirenz (EFV)**
  This regimen can be given when Zidovudine is contraindicated, such as in the presence of anaemia, or concomitant use of anti-TB therapy where Nevirapine can not be used.
• Stavudine (d4T) + Lamivudine (3TC) + Nevirapine (NVP)
  This regimen can be used when there is significant anaemia and use of Efavirenz is contraindicated (e.g. for a pregnant woman who is also anaemic). Nevirapine challenge dosing is required as above.
• Tenofovir (TDF) + Emtricitabine (FTC) + Efavirenz (EFV)
• Tenofovir (TDF) + Emtricitabine (FTC) + Nevirapine (NVP)

The above 2 regimens which contain TDF are indicated when a patient can not use both Stavudine and Zidovudine, for example in the case of both severe anaemia and severe peripheral neuropathy. However, the major concern with Tenofovir-based treatment is renal safety. Tenofovir-associated nephrotoxicity is especially likely in patients with pre-existing renal dysfunction or those receiving other concomitant nephrotoxins. Otherwise the overall rate of discontinuation for renal events is extremely low. Renal function should be monitored through routine urine testing for the occurrence of proteinuria.
In cases where Nevirapine or Efavirenz cannot be used as a first line drug, a single drug from the second line drugs can be used; for example LPV/r or ABC.

Note:
The use of Tenofovir or a second line drug with first line drugs should be decided by clinicians with experience in managing HIV. Therefore, patients whose condition requires such decisions should be referred to the regional hospital

ART in women of childbearing potential or pregnant women
The guiding principle for the treatment of women of childbearing potential or pregnant women is that therapeutic decisions should be based solely on their need and eligibility for ART. The recommended first-line regimen for this patient subgroup is: AZT + 3TC + NVP. However, special circumstances of pregnancy or breast-feeding raise additional issues concerning toxicity to mothers and children, the choice of ARV drugs, and the prevention of HIV transmission from mothers to infants.
While d4T might be necessary as a substitute for AZT, close monitoring should be done because of the increased risk of the development of lactic acidosis due to d4T use.
Women who are receiving ART and become pregnant should continue their treatment unless they are in the first trimester of pregnancy and EFV has been part of the regimen, in which case, EFV should be discontinued and replaced by NVP.
**Note:**
ARV drugs have the potential to either decrease or increase the bioavailability of steroid hormones in hormonal contraceptives. Thus, if a woman on ARV treatment decides to initiate or continue hormonal contraceptive use, the consistent use of condoms must be recommended for preventing HIV transmission. This may also compensate for any possible reduction in the effectiveness of the hormonal contraceptive.

**Antiretroviral drugs for non-ART naïve patients**
Treatment for patients who have been previously exposed to Antiretroviral therapy should be discussed with an antiretroviral expert before they are enrolled in the CTC and (re)started on treatment. Generally:
- Patients that are controlled on their antiretroviral medication at appropriate doses should continue on the same regimen if possible.
- Those who stopped for reasons other than treatment failure and for whom failure is not suspected, can restart the original regimen.
- Those known or suspected to have failed a previous regimen should be started on drugs they have not been exposed to before as appropriate.

**Adherence to Antiretroviral therapy**
Adherence to ART is an essential component of treatment success. Adherence rates of more than 95% are needed to maximize the benefits of ART. Achieving such high rates over a long period of time is a challenge; therefore different approaches to improving adherence should be sought and tailored to the patient’s lifestyle through proper counselling and health education.

**Factors that Influence adherence**
The following predictors of good adherence to HIV medications have been identified:
- Availability of emotional and practical life support, including the assigning a treatment assistant at home
- Patients’ ability to fit the medications into their daily routine
- Patients’ understanding that poor adherence leads to resistance development and may limit future treatment options
- The recognition that taking all medication doses is important
Patients feeling comfortable to take their medication in a variety of settings including in public
• Availability of a clinic capable of monitoring treatment
• Keeping clinic appointments

**Strategies that enhance adherence**
There are three main categories of strategies that those caring for HIV patients must be aware of to facilitate improvement and sustain adherence to treatment with ARVs. Below are the different strategies and their applicability:

(i) **Patient related strategies**
• Health care workers should negotiate a treatment plan that the patient understands and to which he/she commits.
• A patient’s “readiness” to be on life-long medication should be clearly established.
• Patients must understand that the first ART regimen has the best chance of long-term success.
• Family members should be recruited to become participants in the treatment plan.

(ii) **Clinician and health team related strategies should include**
• Building a trusting relationship with patients
• Adopting provider attitudes and behaviours that are supportive and non-judgmental to encourage patients to be honest about their adherence and about problems they have with adherence.
• Monitoring and encouraging adherence at every clinical encounter.
• Explaining possible side effects when initiating treatment

(iii) **Regimen-related strategies**
• Regimens should be simplified by reducing the number of pills and the frequency of taking drugs
• Drug interactions and side effects should be minimized through rational drug selection
• Differences between medication requirements (e.g. with food, without food, etc.) should be minimized

**Changing Antiretroviral therapy**
There are multiple reasons which may prompt the need to change antiretroviral therapy. These can be grouped into two major categories:

1. **Drug adverse events – toxicities, including**
   • Intolerable side effects
   • Drug interactions
   • During pregnancy if the patient is on **EFV**
2. Treatment failure or type of treatment failure

- Clinical failure – occurrence or persistence of HIV related OIs
- Immunological failure
- Virological failure

There are no studies or reliable estimates of the number of days, weeks, or months that represent a clinically important interruption of one or more components of a therapeutic regimen that would increase the likelihood of drug resistance. If there is a need to discontinue any Antiretroviral medication for an extended period, Clinicians and Patients should be advised of the theoretical advantage of stopping all antiretroviral agents simultaneously, rather than continuing one or two agents, to minimize the emergence of resistant viral strains. However, with regimens containing Nevirapine, dual therapy should continue for a week after stopping Nevirapine.

Changing Antiretroviral therapy due to toxicity

From a clinical perspective, it is generally recommended that when changing a patient's regimen due to toxicity, only the toxic drug(s) should be replaced, if possible. Table below provides guidance on ARV drug combinations with some common toxicity switches

Common toxicity switches for first line drugs

<table>
<thead>
<tr>
<th>First Line</th>
<th>Problem</th>
<th>Substitution</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZT + 3TC + NVP or ERV*</td>
<td>Anaemia due to AZT</td>
<td>d4T + 3TC + NVP or ERV* TDF*** + FTC + NVP or EFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TDF*** + 3TC + NVP or EFF</td>
</tr>
<tr>
<td>d4T + 3TC + NVP</td>
<td>Hypersensitivity due to NVP</td>
<td>d4T + 3TC + ERV*</td>
</tr>
<tr>
<td>d4T + 3TC + NVP or ERV*</td>
<td>Severe peripheral neuropathy due to d4T</td>
<td>AZT + 3TC + NVP or ERV* TDF*** + FTC + NVP or EFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TDF*** + 3TC + NVP or EFF</td>
</tr>
<tr>
<td>d4T + 3TC + NVP or ERV*</td>
<td>Intolerant of NVP and EFV</td>
<td>D4T + 3TC + LPV/RTV** TDF*** + FTC + LPV/RTV**</td>
</tr>
<tr>
<td>TDF containing regimen</td>
<td>Nephrotoxicity due to TDF</td>
<td>Replace with AZT or d4T</td>
</tr>
</tbody>
</table>

*Only if the patient is older than 3 years of age or is a woman with no risk of pregnancy.
** Follow liver function tests (LFTs) closely.
***Follow renal functions closely.
Severity of Adverse Events Due to ARVs
Side effects or toxicities caused by ARVs can be classified into three broad categories:

**First category:** Symptoms are mild and transient and often require patient assurance that these symptoms are common and will decrease over time. These can be mild headaches, mild gastric upset, nausea, fatigue and the CNS disturbances particularly with EFV. ARV interruption is seldom indicated in this situation.

**Second category:** Symptoms are somewhat more severe and often respond to some medical intervention. They include more severe gastric upset with nausea and vomiting, more severe headaches and mild peripheral neuropathy that does not incapacitate or interfere with a patient’s lifestyle. These symptoms can often be successfully treated with Anti-emetics, Anti-diarrhoea medicines, Analgesics, Neuroleptics (e.g. Amitriptylin) and other medicines. ARV interruption is usually not indicated in this situation and often symptomatic treatment is only temporary. The mild rash associated with NVP (dealt with under a separate paragraph below) can often be treated with medical intervention.

**Third category:** Symptoms are severe such that ARV drugs must be stopped and replaced by an alternative drug. These include anaemia (haemoglobin less than 7.5 gm/dl or a falling haemoglobin, that often drops by 2gm/dl) as can occur with the use of AZT. Severe symptoms noted in the first two categories can sometimes lead to the stopping of ARV due to severe toxicities such as nausea with severe discomfort and minimal intake for 3 or more days, vomiting all intake in 24 hours or dehydration due to vomiting, severe headache not responsive to non-narcotic analgesics, or fatigue reducing activity by more than 50%. In these situations, one or more ARVs should be replaced by another. This also includes the hypersensitivity reaction to NVP which can include a severe rash or liver function test (LFT) elevations to grade III or >5 times the upper limit of normal range.

**NVP Hypersensitivity Reactions**
NVP hypersensitivity reactions can manifest as a rash and/or elevated LFTs. The rash can occur in up to 20% of patients and usually occurs in the first 6-8 weeks of therapy. NVP will be initiated at a lower dose for the first 2 weeks when only one NVP dose is given per day for 14 days. If there are no clinical signs or symptoms of a NVP hypersensitivity or allergy, the LFT (ALAT) will be checked and the NVP dose will be escalated to 2 doses per day starting at the second week.
There are commonly two levels of severity in NVP-induced rashes.

i) **Mild NVP hypersensitivity reaction**

A mild rash is defined as erythema, urticaria, intact skin, no blistersing or sloughing of skin or desquamation, no involvement of mucous membranes, no angioedema, and no systemic signs (body aches, arthralgias, myalgias, fevers, lymphadenopathy or significantly elevated LFTs). If a mild drug-reaction type rash occurs, patients will continue treatment with caution and careful monitoring. LFTs that are less than grade III (<5 times the upper limit of normal) can usually be followed until it is resolved. This rash will be treated with patient assurance, antihistamines and close follow up until resolved. NVP dose escalation will be delayed for up to one week until symptoms disappear. If symptoms worsen, this may indicate that the patient has severe hypersensitivity reaction and NVP will have to be stopped immediately and other medical interventions considered.

ii) **Severe NVP hypersensitivity reaction (Stevens-Johnson syndrome, SJS):**

A severe rash is defined as severe erythema, urticaria, moistening of skin (desquamation), skin blistersing, sloughing of skin, exfoliative dermatitis, erythema multiforme (when severe and involving the mucous membranes known as SJS), anaphylaxis, involvement of mucous membranes, angioedema, cracked/fissured lips, or systemic signs (body aches, arthralgias, myalgias, fevers, lymphadenopathy or significantly elevated LFTs). If a severe drug-reaction type rash occurs, patients will discontinue NVP treatment, begin high dose prednisolone, antihistamines, analgesics, and be admitted to the hospital for I.V fluids and careful monitoring. LFTs can be grade III (>5 times the upper limit of normal) or higher. NVP will be stopped immediately and not re-introduced. All ARVs will be stopped. Once the patient recovers, 3 ARV drugs will be started that do not include NVP. The remaining 2 ARVs will be paired with a replacement ARV such as EFV, if not contraindicated.

**ABC (Abacavir) Hypersensitivity**

ABC hypersensitivity occurs in 3-5% of patients and can be fatal. Hypersensitivity symptoms include: flu symptoms, shortness of breath, cough, fever, aches and pains, a general ill feeling, fatigue/tiredness, swelling, abdominal pain, diarrhoea, nausea, muscle or joint aches, numbness, sore throat or rash. ABC will be stopped immediately and not re-started if this occurs.
Note: If there is a history of ABC hypersensitivity, then ABC is contraindicated.

**EFV (Efavirenz) Side Effects**
EFV can cause CNS side effects such as vivid dreams, nightmares, vertigo, or confusion. These symptoms are often mild and transient. Patients may benefit from assurance that these symptoms are common and will decrease over time.

**d4T (Stavudine) Side Effects**
Peripheral neuropathy is a common side effect with the use of Stavudine and occurrence of lactic acidosis has been reported. These need to be carefully monitored.

**Changing Antiretroviral therapy due to treatment failure**
Treatment failure can be virologic, immunologic and/or clinical. It results from failure to suppress viral replication with the development of viral resistance.

Virological Failure is defined as:
- Primary virologic failure if there is a fall in Viral Load (VL) by less than a 10-fold drop in viral load after 6-8 weeks of therapy.
- Secondary virologic failure if there is a 10-fold increase of VL from lowest recorded level.

Immunologic failure if defined as a:
- 30% drop in CD4 count from peak value, or
- Return to pre-ART baseline CD4 count or lower

Clinical failure results in disease progression which clinically may present with the development of opportunistic infections or malignancy occurring 3 months or more after initiation of ART.

**Second-Line ARV Regimen**
Before treatment failure is presumed and a particular regimen discarded, every effort should be made to rule out causes other than drug resistance. Patients should be evaluated for correctable factors, such as:
- Inappropriate dosing schedules
- Drug interactions that may reduce the efficacy of some of the ARV
- Non adherence due to side effects
- Evidence of malabsorption
Each of the above scenarios could result in sub-therapeutic drug levels and poor clinical response. In such cases, the regimen in question may be salvaged with palliative medication and/or patient education. If clinical assessment indicates the presence of treatment failure due to confirmed drug resistance, the best approach is to switch to an entirely new regimen, choosing two or more drugs to which the patient is naïve as the second line drug regimen. Before changing to the second line drug regimen, the patient needs to go through the treatment readiness and education process again. This needs to be carefully monitored as some patients might hide their non-adherence.

Second-line Antiretroviral therapy in adults and adolescents

- Abacavir (ABC)
- Didanosine (ddI)
- Tenofovir (TDF)
- Lopinavir boosted by Ritonavir (LPV/r)
- Atazanavir boosted by Ritonavir (ATV/r) 300mg/100 mg

The default second line regimen for adults and adolescents includes the following drug combinations: ABC+ddI+LPV/r

The doses should be administered as follows:
- Abacavir 300 mg twice daily
- Lopinavir/Ritonavir 133.3/33.3 mg (Kaletra) 3 tablets twice a day
- Didanosine 200 mg, two tablets a day on an empty stomach

**Note:**
- ddI is easier to dose at 250-300 mg once a day for a body weight of <60 kgs and 400 mg once a day for a body weight of >60 kgs
- The dose for Atazanavir/r is 300mg/100mg given 6 hourly
  Alternatively the following regimens can also be used:
- ABC+TDF+LPV/r or ATV/r
- ABC+ddI+ATV/r

Women of childbearing and pregnant Women

The first line treatment of women of childbearing and pregnant women should be based sorely on their need and eligibility for Antiretroviral Therapy.
- The first line regimen for this patient subgroup is AZT+3TC+NVP.
- The second line regimen is ABC+ddI+SQV/r or NFV
- Pregnant women who are not eligible for Antiretroviral Therapy should receive prophylaxis according to PMTCT guidelines
Treatment in infants and children using Antiretroviral medicines

Determination of HIV infection in infants/children under 18 months possesses special diagnostic challenges. The pathogenesis of HIV infection and the general virological and immunological principles underlying the use of ART are similar for all HIV infected persons. However, when prescribing ARVs in children, the following consideration should be made namely:

- Possible in utero exposure to ARV medicines
- Difference in immunological markers among children of different age groups
- Change in pharmacokinetic parameters with age caused by the continuing development and maturation of organ systems involved in drug metabolism and clearance
- Differences in the clinical virological and immunological parameters between children and adults and among children of different age group
- Adherence to treatment for children is influenced by parents/guardians

Criteria for initiation for Antiretroviral therapy in children

There are difficulties in making laboratory diagnosis of HIV infection in infants aged less than 18 months due to persistent of maternal antibody, thus requiring virological testing to make definitive diagnosis of HIV infection in this age group. The recommendations for initiation of antiretroviral therapy in children are divided into categories related to:

- Age
- Availability of virological diagnostic tests

When CD4+ cells assay are available, use of CD4+ cell percentage is recommended for decision making on ART.

The availability of virologic testing is desirable, but not absolutely necessary to the development of recommendation for the initiation of therapy in infants

Initiation of treatment for infants under 18 months

Initiation of Antiretroviral therapy in infants under 18 months is recommended in:

- Infants with WHO stage 3 or 4 disease, initiate ART regardless of neither CD4 percentage nor virological confirmation/availability but confirm HIV antibody diagnosis at 15-18 months

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• Infants with virological proven infection and have WHO paediatric stage 3
• Infants are in WHO paediatric stage 1 or 2 disease with CD4 less than 20% and virological confirmation
• Infants less than 18 months with neither virological confirmation nor CD4 percentage available, with WHO paediatric stage 3 or 4. In these cases, HIV antibody testing must be repeated at age 18 months to definitively confirm that the child is HIV infected. Only infants/children with confirmed infection should have ART continued.
Initiation of treatment for infants above 18 months

**Clinical features:**
For children above 18 months of age, a positive antibody test is an indication of HIV infection since any acquired antibodies from mother would have degenerated, and breast feeding has typically stopped. Initiation of ART is therefore recommended if:
- WHO paediatric stage 3 or 4 HIV disease irrespective of CD4 percentage
- WHO paediatric stage 1 or 2 HIV disease and CD4 less than 15%

All children in stage 3 could be started on ART even if a CD4 percent is not available, but attempt should be made to do a CD4 percent as soon as possible for monitoring.
Treatment regime for infants and children

First line ARV Regimen:
• Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP) for children under 3 years old.
• Zidovudine (AZT) + Lamivudine (3TC) + Efavirenz (EFV) or Nevirapine (NVP) - for children 3 years old or more.
• Abacavir (ABC) + Lamivudine (3TC) + Efavirenz (EFV) for children 3 years or more or Nevirapine (NVP) for children under 3 years.

Note: d4T is an alternative for AZT in case of anaemia (Hb less than 7.5g per Decilitre). The product in liquid formulation requires refrigeration

Second line ARV Regimen:
The recommended second line regimen for infants and children who have failed first line is as follows:
• Didanosine (ddl) + Abacavir (ABC) + Lopinavir / Ritonavir (LPV/r)

Note: Given the bitter taste of LPV/r, children sometimes refuse it because of the taste. Nelfinavir (NFV) may be used as a substitute for LPV/r

USE OF ARV IN SPECIAL CIRCUMSTANCES
Treatment of People with Tuberculosis and HIV Co-infection
The recommended first line regimen is (AZT or d4T) +3TC+EFV in which the dose of EFV is 800mg.
Patients who develop TB while on ART, treatment should be continued through TB treatment with changes as follows:
• First line medicines: Substitute EFV with NVP. If this is not possible, substitute NVP with ABC or SQV/r.
• Second line medicine: Substitute Lopinavir/ritonavir with Saquinavir/ritonavir (dose 400/400mg every 12 hours- 3 extra capsules of ritonavir). This should be continued until two weeks after completion of Tb treatment, when the extra ritonavir can be stopped.
Treatment of people with Tuberculosis before commencing ART

- If the patient has CD4+ count of more than 350 cells/mm cubed, ART is not yet needed. The need for ART should be reassessed on completion of TB treatment.
- If the patient has a history of WHO stage 4 illnesses and/or a CD4+ count of 200 -350 cells/mm cubed, complete 2 months of Tb therapy before commencing ART.
- If the patient has a CD4+ count of less than 200 cells/mm cubed or other serious HIV related illness, make sure that the patient is tolerating Tb treatment before initiating ART. Patients in this group should be started on the first line therapy consisting of d4T/3TC/EFV

SPECIAL CONSIDERATIONS OF ART IN TB AND HIV CO-INFECTED PATIENTS

<table>
<thead>
<tr>
<th>CD4&gt;200 or CD4&gt; 15%</th>
<th>Treat TB first</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 50 – 200 or CD4 5% - 15%</td>
<td>Treat TB first at least for 2 months before ART (but evaluate case-by-case)</td>
</tr>
<tr>
<td>CD4&lt;50 OR CD4&lt;5%</td>
<td>Can begin ART as early as 2 weeks after TB treatment initiation</td>
</tr>
</tbody>
</table>

POST EXPOSURE PROPHYLAXIS (PEP)
The most common mode of exposure to HIV is in hospital setting where hospital workers are at increased risk of HIV infection through exposure to body fluids through accidents or when safety precautions are not followed. However, the other most common cause of exposure is through sexual assault

**Drug treatment:**
The recommended treatment regimen is:
- **AZT** 300 mg every 12 hours + **3TC** 150mg every 12 hours for 4 weeks
- A third medicine, **EFV** or **NVP** (proposed Indinavir) should be added if there have been multiple perpetrators, anal penetration occurred, trauma to the genital areas, if one of the perpetrators is known to be HIV positive
*Administering PEP on an HIV+ individual could lead to resistance development*
15.0 CARDIOVASCULAR DISEASES

15.1 **High Blood Pressure (Hypertension)**

*Description/clinical features:*
Hypertension is elevation of blood pressure (B.P) noted on at least three separate occasions. The disease processes associated with high arterial pressure are the consequences of the damage caused to the heart or to the arterial wall. The consequences of the actual level of pressure in a given person will depend not only on the measured level but also upon certain other ‘risk’ factors such as age, race, sex, glucose intolerance, cholesterol and smoking habit hypertension. In over 80% of hypertensive patients no specific cause is detectable, hence the name ‘primary hypertension.’ Hypertension can be secondary to conditions like coarctation of the aorta, renal disease, endocrine disease and EPH gestosis due to the contraceptive pill. Hypertension is symptomless in the majority of patients. Because hypertension may result in secondary organ damage and reduced life span it should be evaluated and treated appropriately.

**Types of High Blood pressure:**

1. **Essential (Primary) or idiopathic** – over 90%, most common in black peoples (course not known).

2. **Secondary** – caused by renal disease, increase of rennin, age due to arteriosclerosis, stress, obesity, diabetes, inheritance and endocrinology.
High blood pressure should only be diagnosed when the blood pressure is raised at rest on three occasions over 1 – 2 weeks.
**Classification:**

**Diastolic/Systolic**

**Mild hypertension:** DBP 90 – 99 mm Hg /140-159 mm Hg

**Moderate hypertension:** DBP 100 – 109 mm Hg /100-180 mmHg

**Severe hypertension:** DBP 110 mm Hg or above/ 180 mm Hg and above

Lower levels of blood pressure **below 130/80 mmHg** are recommended for diabetics

**Non-Drug Treatment:**

**Mild hypertension**

Advice change of life style:
- Lose weight (diet control)
- Stop smoking
- Stop alcohol
- Daily exercise
- Low salt diet, fats diet, eggs, coconuts.
- Monitor blood pressure regularly
- Stop using contraceptive pills.

**Drug Treatment:**

**Mild Hypertension**

Patients with mild hypertension generally can be treated by change in life–style alone but consider total risk profile of a patient.

In diabetics for example medical treatment preferably with a converting enzyme inhibitor (Captopril, Enalapril) is recommended, to protect the kidney.

**Moderate/Severe Hypertension**

Consider drug therapy only in patients with average DBP over 100 mm Hg checked on at least 3 occasions over 6 months in spite of changed lifestyle.

**Note:** A step up approach is recommended for choice of antihypertensive drugs.

**Recommended Step-up Care**

**Step One:**
Bendrofluazide 2.5 – 5mg, oral, once daily

**Or**
Hydrochlorthiazide 12.5-25mg, oral, once daily.
Step Two:
Hydrochlorthiazide 25mg, oral, once daily

Plus
Methyldopa 250mg, oral, 8 hourly
Or
Propranolol 40-80mg, oral, once daily
Or
Atenolol 50 – 100mg, oral, once daily
Or
Nifedipine modified release 20-30mg, oral, once daily

Step Three:
Captopril 12.5 – 25mg, oral, 8 hourly
Plus
Furosemide 40-80mg, oral, once daily, preferably in the morning
Plus
Propranolol, oral, 40-80mg once daily
Or
Atenolol 50-100mg, oral, once daily
Or
Nifedipine modified release 20-30mg, oral, once daily

Advice:
Antihypertensive treatment is required for life in truly hypertensive patients. Hypertension often has no symptoms; the aim of treatment is to lower the risk of end-organ damage, especially stroke.

Compliance is the most important determinant of blood pressure control. Explanation, education and minimizing side-effects of drugs are important.

Extra care should be taken with antihypertensive drugs administered to those over 60 years of age, because of increased side-effects. Lower doses are needed. Recommended an alternative contraceptive method for women using oestrogen containing oral contraceptive.

The adverse effect of hypertension principally involve the blood vessels (vasculopathy), the central nervous system (cerebral vascular accident -CVA), the retina (retinopathy), the heart (Ischemic heart disease) and the kidneys (nephropathy) and can often be detected by simple clinical means. Patients should be reviewed every 1-3 months, and more often if necessary. Sudden blood pressure reduction may precipitate stroke.
or blindness. It is only indicated in those patients with hypertensive crisis (see below)

The aim of treatment is to bring the diastolic BP below 90 mm Hg, without unacceptable side effects.

**Prevention:**
Change in Life style
- Regular exercises and weight reduction for overweight patients
- Dietary management
- Relaxation to calm down stress
- Discontinuation of smoking
- Avoidance of stress
- Patients with previous history of EPH should use alternative contraceptive.

**Adjuvant drug therapy**
**Asprin**: Antiplatelet therapy is a powerful means of reducing cardiovascular risk but may cause bleeding particularly intracerebral haemorrhage, in a small number of patients. The benefits of Asprin therapy are thought to outweigh the risks in hypertensive patients age 50 or over who have well controlled blood pressure and either target organ damage or diabetes.

**Adults**: Acetylsalicylic Acid (Asprin) 75mg, oral, once daily

**Note**: Acetylsalicylic Acid is contraindicated in peptic ulcers

**Statins**
Treating hyperlepidemia can also produce a substantial reduction in cardiovascular risk.

**Complications:**
Heart failure, CVA (stroke), eye damage and kidney failure.
Hypertension in pregnancy
For mother: Fits, convulsions, renal failure and sometimes death
For Baby: Small for dates and interuterine fetal death,

**Referral Criteria:**
Moderate, severe and crisis hypertension.
Refer severe and crisis patient urgently.
Complications:
Heart failure, stroke, eye damage, kidney disease.
Hypertension in pregnancy can cause problems for the mother (fitting) and/or the baby (early labour, etc.)

15.2 Angina Pectoris

**Description/clinical features:**
Angina pectoris is the symptom complex caused by transient myocardial ischemia and constitutes a clinical syndrome rather than a disease; it may occur wherever there is an imbalance between myocardial oxygen supply and demand. Coronary atheroma is by further most common cause of angina; however the symptom may also be a manifestation of other forms of heart disease, particularly aortic valve disease and hypertrophy cardiomyopathy.
The presenting clinical features are central chest pain, discomfort or breathlessness that is precipitated by exertion or other form of stress and is promptly relieved by rest. Some patients find the pain comes when they start walking and that later it does not return despite greater effort (start-up angina).

**Non drug treatment:**
- The management of angina pectoris involves:
- A careful assessment of the likely extent and severity of arterial disease
- The identification and control of significant risk factors (e.g. smoking, hypertension and hyperlipidemia)
- The use of measures to control symptoms
- The identification of high-risk patients and application of treatment to improve life expectancy

Other factors which should be considered and addressed where appropriate include: high blood cholesterol, stressful lifestyle and excessive alcohol intake. Regular moderate exercises should be encouraged.

**Drug treatment:**

**Stable Angina (Infrequent Attacks)**

**Antiplatelet therapy**
Acetylsalicylic acid (Aspirin) 75-150mg, oral, once daily reduces the risk of adverse events such as myocardial infarction and should be prescribed for all patients with coronary arterial diseases indefinitely. (Contraindicated in peptic ulcers)
Anti-anginal drug treatment
Four groups of drugs are used to help to relieve or prevent the symptoms of angina: nitrates, β-blockers, calcium antagonists and potassium channel activator
Nitrites: Glyceryl trinitrate 0.3-1mg, sublingual, repeated as required, usually relieve the attack of angine in 2-3 minutes.

Plus
Glyceryl trinitrate 500 micrograms, sublingual, as required (no more than 3 tablets every 15 minutes).

Note: Glyceryl trinitrate deteriorates on storage. It is recommended that tablets be kept in original container and not more than 3 months after opening. Do not leave the container open for a long time, close immediately after use.

Unstable Angina (Frequent Attacks)

First choice: Isosorbide dinitrate, oral, 30-120 mg/day in 12 hourly.

Caution: Acetylsalicylic acid (Aspirin) is contraindicated in patients with peptic ulcers
If no response, add:

Second choice: Propranolol 40-80 mg, oral, 8 hourly
Or
Atenolol 50 – 100 mg, oral, once daily
Atenolol is preferred for diabetics and asthmatics. If there is no response to the combination of nitrates and beta-blockers change to:
Nifedipine 10-20 mg, oral, 8 hourly

Referal criteria:
Nifedipine may replace or be cautiously combined with beta-blockers. If pain continues in spite of above treatment refer patient for further management.

15.3 Myocardial Infarction (MI)
Description/clinical features:
It is ischemic necrosis of the heart muscle due to occlusion of coronary arteries by thrombus or sub-intimal hemorrhage at the site of atheromatous narrowing. The cardinal symptom of MI is pain but breathlessness, vomiting and extreme tiredness and syncope may be
present. The pain occurs in the same sites as for angina pectoris but is usually more severe and lasts longer.

**Non drug treatment:**
- Rest, reassurance
- Early ambulation

**Drug treatment:**
The main immediate needs are for the relief of pain, thrombolysis, and prevention or treatment of arrhythmias and other complications.
Acetylsalicylic acid soluble 300mg, oral, immediately, followed by 150mg daily.
**Plus**
Isosorbide dinitrate 5mg, sublingual, immediately.
**Plus**
Streptokinase 1.5 MU, I.V, diluted in 200mls sodium chloride 0.9%, infused over 30-45 minutes.
**Or**
Heparin (I.V) 5000 IU, 8 hourly in the acute phase and Then Warfarin 5-10mg, oral, in 24 hours.
**Plus**
Morphine 2-4 mg, I.V, every 5 minutes diluted with Sodium chloride solution 0.9% until pain subsides.

**Note:**
Do not use heparin if streptokinase is given.
Oxygen should be given.

**General Measures:**
Bed rest
Oxygen administration
Set up an I.V line (dextrose 5%)

**Note:**
Avoid I.M injection where possible since this interferes with the measurement of cardiac enzymes. If necessary, give oral antiemetic: Metoclopropamide, oral, 10mg 8 hourly
**Note:**
Thrombolytic/Anticoagulant therapy is only indicated in patients with infarcts of less than 6 hours duration.
Prochlorperazine 5 mg, oral, 6 hourly when required
Streptokinase 1500000 IU, I.V., in 100 ml normal saline or dextrose 5% over 1 hour, to be preceded by hydrocortisone, I.V., 100 mg as a single dose

**Plus**
Heparin (I.V) 20,000-30,000 IU per day in divided doses for 48 hours.
To be commenced 6 hours after streptokinase administration

**Plus**
Acetylsalicylic acid 150 mg, oral, once daily

**Caution:**
Do not give digoxin in acute infarction unless there is a supraventricular arrhythmias which requires it
Do not use inotropic agents such as isoprenaline, glucagon or adrenaline, as they may be productive and cause an extension of the infarction indefinitely

**Left Ventricular (Pump) failure**
Treated in the normal way (see cardiac failure).

**Arrhythmias**
**Bradycardia**
**Sinus Bradycardia**

Post-infarction:
Atropine 0.6 mg, I.V, to maintain pulse above 50 per minute
If chronic (sick sinus syndrome) patient requires pacemaker – refer

**Note:** Post-infarction angina is treated as for angina pectoris.

**Tachycardia**
**Atrial fibrillation**
Direct current (D&C) cardioversion
Caution: If patient is on digoxin avoid it if there is mitral stenosis. Digoxin therapy should be withdrawn 36 hrs before electric cardioversion. Anticoagulants should be provided after D&C cardioversion for 4 weeks.

Supraventricular Tachycardia
Consider D&C cardioversion if patient distressed.
Carotid sinus massage/valve manoeuvre

Verapamil 5-10 mg, I.V bolus,
Repeat at 5 minute intervals until tachycardia controlled; max 1 g.

Caution: Verapamil with B-blocker combinations are dangerous. Verapamil with Digoxin combinations should be used with caution.

Ventricular tachycardia
Consider D&C cardioversion if patient distressed
5%Lignocaine 100 – 200 mg, I.V, followed by infusion 2-4 mg per minute for 12-24 hours.
Or
Amiodarone 200-400mg, oral, daily.

Caution: Ensure Potassium ion>3.5 mmol/1 in all arrhythmias.

Rehabilitation
The period of bed rest, rehabilitation, and management varies in individual cases; precipitating factors should be avoided, such as smoking, high cholesterol diet, stress, and thrombogenic agents such as oestrogen.

Prevention of Re-infarction
Acetylsalicylic acid 150 mg, oral, daily.
The addition of β - blockers may be beneficial:
Propranolol, oral, 40 – 80 mg twice daily
Or
Atenolol 50 – 100 mg, oral, once daily.
Plus Simvastatin 20mg, oral, at night.

15.4 Cardiac Failure

Description/clinical features:
It is a state in which an abnormality of cardiac function is responsible for the failure of the heart to pump sufficient blood to meet tissue requirement.
Most commonly seen in severe anaemia less than 5gm/dcl (usually a result of malaria). Other causes include rheumatic fever, hypertension and I.V fluid overload.

Breathlessness (Dyspnoea), oedema, especially lower limb, hepatomegally, excessive sweating, basal crepitation. congestive hepatomegaly and peripheral oedema. The principles of therapy are removal of the precipitating cause, e.g. pneumonia, correction of the underlying problem e.g. hypertension and control of the congestive heart failure state.

Non drug treatment:
• Patient and family education.
• Monitor body weight to assess changes in fluid balance.
• Limit fluid intake to 1–1.5 L/day if fluid overloaded despite diuretic therapy.
• Salt restriction.
• Regular exercise within limits of symptoms.
• Avoid NSAIDs as these may exacerbate fluid retention.
• Counsel regarding the risk of pregnancy and the use of oral contraceptives.
• Sit the patient up, with pillows behind the back.

Acute cardiac Failure

Drug treatment:
Formulæ (due to pulmonary oedema)

Amount of fluid to be given \( \times \) Rate factor (20)  
Time to be given in minute

Adults: Frusemide 40-80 mg, I.V, single dose
Or
Bumetanide 2-5mg, I.V, over 30-60 minutes.
Or
Bumetanide 2 - 5mg, oral, stat, then 1 mg 12 hourly.

Children: Frusemide, I.V, 1 mg / kg single dose.

And
Digoxin 0.75 – 1mg, I.V, over at least 2 hours, then maintenance dose by mouth on the following day: 125 – 250micrograms daily (lower dose may be appropriate in elderly)

And
Captopril 6.25 – 12.5mg, oral, initially under close supervision, usual maintenance dose 25mg, 2 – 3 times daily, maximum 50mg twice daily.

Note:
Blood transfusion is necessary for patients with severe anemia. Ensure a blood donor (relative if possible) goes with the patient to hospital. Diuretic treatment will provide only limited temporary relief for these patients.

Referral criteria:
Refer urgently in the sitting – up position.

Chronic cardiac Failure
Refer all new cases to high level hospital or special clinic.
Manage as per the instructions of the hospital specialist.
Ensure the patient takes the medication regularly and attends follow – up hospital appointments as required.
Refer any patient with increased respiratory rate or increased swelling of legs for review.

15.5. Rheumatic Heart Disease (RHD)
Description/clinical features:
These are chronic sequelae consisting of valvular damage, usually left heart valves, with progression and complications.

Clinical features of the rheumatic heart disease are closely parallel to those of acute rheumatic fever. The main site of pathology is on the valves. There may be initial stenosis, mixed mitral valve disease (both stenosis and regurgitation), mitral regurgitation due to chordal shortening, aortic stenosis and incompetence, aortic regurgitation due to aortic cusp distention, acquired tricuspid valve disease resulting in
either stenosis or regurgitation. The main clinical features of rheumatic heart disease depend on the valve damaged. For example in pure mitral stenosis there is reduction in exercise tolerance, breathlessness and palpitation. In the case of aortic regurgitation, when severe, then the clinical manifestations are those of left ventricular failure.

**Non Drug treatment:**
- Acute stage bed rest and supportive care
- Patient education
- Intensive health education for prevention of sore throats

**Drug treatment:**
- For eradication of streptococci in throat:
  - Benzathine penicillin 1.2 MU, I.M, as single dose.
  - Or
  - Phenoxymethylpenicillin 500mg, oral, 8 hourly for 10 days.
- For Penicillin allergy patients:
  - Erythromycin 500mg, oral, 8 hourly for 10 days.

**Prevention:**
A patient with rheumatic heart disease is at risk of getting recurrences of acute rheumatic fever, which may lead to further rheumatic heart disease manifestations with more valves being involved or more damage to already affected valves. Treat complications which arise e.g. congestive heart failure Valvular replacement surgery is indicated for the treatment of valvular rheumatic heart disease.

Prophylaxis to prevent recurrence of rheumatic fever:
- Benzathine penicillin 1.2 MU, I.M every three weeks for life

**Anticoagulants (Warfarin)**
These are indicated in patient with prosthetic valves where regular determination of prothrombin time is possible.
Refer such care for prothrombin determination and warfarin administration.

**15.6 Rheumatic fever**
**Description/clinical features:**
Rheumatic fever is a disease caused by streptococcus infections; usually start at throat, skin infection (impetigo), tonsillitis, and pharingitis. This is predominantly a disease of childhood and adolescence. It
produces arthritis, skin rash. There may be heart problems and other complications.
Bacteria infected joints, muscles of heart and valves

**Drug Treatment:**
**Treatment of Acute Attack**
**Children under 5 years:** Benzathine penicillin 0.3 MU, I.M, as a single dose:
**Children 5-10 years:** Benzathine penicillin 0.6 MU, I.M, as single dose.
**Children above 10 years and adults:** Benzathine penicillin 1.2 MU, I.M, as a single dose.

**Or**
Phenoxymethylpenicillin, oral, for 10 days
**Children under 5 years** 125mg, 6 hourly
**5-10 years:** 250mg, 6 hourly
**Above 10 years and adults:** 500mg 6 hourly

**Or**
Erythromycin, oral, 500mg, 6 hourly for 10 days (penicillin allergy).

**Prophylaxis after Rheumatic Fever**
Prophylaxis should be given to all patients with a history of rheumatic fever and to those with heart valve lesions thought to be or rheumatic origin. When possible, prophylaxis should be continued up to 30 years of age. This may be individualized in some circumstances.

Specific situations always requiring prophylaxis at least to 30 years are:
• High risk to Streptococcal infections
• Proved carditis in previous attacks
• Not more than 5 years since last attack.
### Table: Antibiotics Prophylaxis after Rheumatic Fever

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Children &lt; 12 years</th>
<th>Children &gt; 12 years and adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzathine penicillin I.M</td>
<td>1.2 M.U monthly</td>
<td>2.4 M.U monthly</td>
</tr>
<tr>
<td><strong>Or</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenoxymethylpenicillin, oral</td>
<td>125-250 mg 12 hourly</td>
<td>250 mg 12 hourly</td>
</tr>
<tr>
<td><strong>Penicillin allergy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin, oral</td>
<td>125-250 mg 12 hourly</td>
<td>250 mg 12 hourly</td>
</tr>
</tbody>
</table>

**Note:** Prophylaxis is given to prevent recurrence of rheumatic fever, and is not enough to protect against infective endocarditis. Phenoxymethylpenicillin and Erythromycin are less effective.
16.0 HEMATOLOGICAL DISEASE CONDITION

16.1 Anaemia

*Description/clinical features:*
Anaemia is a state in which the level of haemoglobin in the blood is below the expected value for age and sex. Anaemia may be due to blood loss, haemolysis or decreased production of red blood cells. The clinical presentation of anaemia depends on the underlying disease, severity and abnormality of the anaemia. These may include, fatigue, palpitation, headache, pallor and features of heart failure may occur in severe cases.

16.1.1 Iron Deficiency Anaemia

*Description/clinical features:*
Anaemia due to iron deficiency, common causes of Iron deficiency are poor Nutritional and blood loss

*Non drug treatment:*
- Treat the cause, for example in iron deficiency anaemia due to hookworm, deworm the patient.
- Blood transfusion is only indicated where it is life saving.

*Drug Treatment:*

**Adult:**
Ferrous sulphate 200 mg, oral, 8 hourly.

**Children:**
Ferrous sulphate, oral, 5 mg/kg body weight, 8 hourly.
Continue for 3 months after the normal haemoglobin has been achieved.
16.1.2 Megaloblastic Anemia

**Description/clinical features:**
Anemia caused by a deficiency of Folate and/or Vitamin B\textsubscript{12}

**Non drug treatment:**
Dietary modification to ensure adequate intake of folate and vitamin B\textsubscript{12}, identify and treat the underlying cause e.g. antibiotics for intestinal overgrowth with Bacteria.

**Drug Treatment:**
- **Folic deficiency**
  Folic acid 2.5 – 5mg, oral, once daily for at least 2 months.

- **Vitamin B\textsubscript{12} deficiency anaemia**
  Hydroxocobalamin 1mg daily parenterally for one week and thereafter 1 mg every 2-3 months for life.

16.1.3 Sickle Cell Anaemia

**Description/clinical features:**
This is an inherited disorder of the haemoglobin in red blood cells. Symptoms usually begin after 6 months of life, and include anaemia, joint pain/swelling, recurrent infections, impaired growth and development, abdominal pain, bossing of the sky, and deep conjunctival jaundice.

**Non Drug treatment:**
- Bed rest
- Give Oxygen

**Drug Treatment:**
- Folic acid 5mg, oral, once daily
- Acetylsalicylic acid gives as required
- Keep well hydrated

**In crisis**
Prompt determination and treatment of precipitating cause e.g. Malaria infection
- Give intravenous fluid and electrolyte therapy

**Adults /Children:**
- I.V Infusion Dextrose with Normal Saline (DNS)
- Give pain relievers e.g. diclofenac 50mg. In severe pain (with no difficulty in breathing)
Adults: Pethidine 25mg-100mg, Subcutaneous or I.M, repeated after 4 hours.

Children: Pethidine, I.M, 0.5mg-2mg /kg

Or

By slow I.V, 25mg-50mg repeated after 4hours

Advice:
There is no cure.
Encourage good nutrition, hydration and full immunization.
Return to clinic early if crisis (bone pain and / or abdominal pain and /or rapid onset of severe of disease.
Use treated bed nets.

Prevention:
Use treated nets
Treat joint pain / swelling with analgesic
Treat infections early with usually drugs.
Ensure child is fully immunized according to the schedule.
Give the patient Proguanil as a prophilaxis of Malaria

Complications:

• Predisposed to infections, eg. Malaria, pneumonia, meningitis, bone problems (including osteomyelitis).

• Crises.

Referral criteria:
Refer the patient urgently to high level hospital.

16.2. Bleeding Disorders

Description/clinical features:
Bleeding disorders can be due to qualitative or quantitative abnormalities in either platelets or coagulation factors. Clinical manifestations often point to the underlying cause of excessive bleeding. The general rule is:

• Bleeding into the skin and mucous membranes: ecchymoses, epistaxis, petechiae, gastrointestinal or genitourinary bleeding are suggestive of platelet disorders.

• Bleeding into the joints or the retroperitoneum suggest coagulation factor abnormalities or warfarin toxicity.
• Bleeding into both joints and mucocutaneous tissue can suggest disseminated intravascular coagulation (DIC).

The most common reason for bleeding is thrombocytopenia. **Thrombocytopenia** refers to a lower than usual number of platelets. Decreased platelet production or increased platelet destruction can result in thrombocytopenia. Bone marrow disease, side effects from drugs such as antineoplastics, and some infectious diseases can result in a decreased platelet count.

### 16.2.1 External Bleeding

This is visible and can be controlled by applying pressure to the site. External bleeding is usually due to trauma as a result of an accident, and often affects one or more limbs.

**Non drug treatment:**
- Raise the injured part (s) up high.
- Apply a dressing to the wound and hold it firmly in place. (The best dressing for this is a pad of several thickness of sterile surgical gauze or a pad of towel or linens.)
- Bandage the dressing over the wound and hold it firmly (but not so firmly that it acts like a tourniquet).
- A tourniquet should never be used.
- Check the circulation regularly beyond the bandage to make sure it is not too tight.
- Elevate the extremity and keep head low.

**Drug treatment:**
Analgesics (not for internal bleeding).
Diclifenac sodium 50mg, oral, 8 hourly.
If bleeding cannot be stopped start an infusion, Normal saline.

**Referral criteria**
Refer the patient urgently to high level hospital.

### 16.2.2 Internal Bleeding

This is a more difficult and dangerous problem. Diagnosis requires a careful history and physical examination. This is best done at the referral hospital. However, internal bleeding should be suspected in anyone who has had a serious injury to the head, chest or abdomen, or any woman who is or could be pregnant. Internal bleeding cannot usually be controlled by applying pressure, except for some cases of vaginal bleeding.
Non drug treatment
• Assess for SHOCK. If present manage as Hemorrhagic Shock.
• Position the patients carefully by laying them flat on the back.

Drug treatment
• Start an I.V infusion Normal saline or Dextran.
• In new born and bleeding for the cord or return should be given Vitamin. K₁ – 5mg I.M or I.V.

Referral criteria
Refer urgently to high level hospital.

Vaginal Bleeding
• Manages as per life saving skill.
• If the patient is or could be pregnant, assess for bleeding per vaginal. If present apply pressure to the vagina using a pad held firmly in place, and manage according to the MCH guidelines.

16.2.3 Hereditary bleeding disorders
Description/clinical features:

Hemophilia is a X chromosome linked recessive trait that is the result of deficiency in the production of factors VIII or IX. Factor VIII deficiency (hemophilia A) can also be acquired as a result of the development of VIII inhibitors. Liver transplant corrects factor VIII deficiency in inherited hemophilia.

Idiopathic thrombocytopenic purpura (ITP) is a condition in which antibodies form against platelets. Patients with bleeding disorders due to platelet problems often experience immediate bleeding after trauma. The bleeding usually affects the skin, mucous membranes, nose, and urinary and gastrointestinal tracts. Bleeding may range from small petechiae to large ecchymotic areas.

Von Willebrand’s disease is the most common hereditary coagulation disorder. It occurs in about 1% of the general population. Many cases go undiagnosed due to the mild nature of the bleeding which is often masked by an acute trauma. Deficiency or molecular defects in vWF result in problems with platelet adhesion. Adhesion is necessary for the activation of platelets.
16.2.3.1 Haemophilia A (Factor VIII deficiency)

Description/clinical features:
Haemophilia A is a chronic bleeding disorders caused by a lack of protein factor VIII.
Amount of factor VIII given depends on assessment of severity of bleeding. Use table to determine dosage, for both children and adults according to body weight.

Non drug treatment:
Haemophilia register.
Dental care

Drug treatment:
Table: Dosage Schedule of Factor VIII

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Severity of bleeding</th>
<th>Required Factor VIII level</th>
<th>Factor VIII Concentrate 500IU/bottle</th>
<th>Cryoprecipitate 80IU/bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mild bleed (nose, gums etc)</td>
<td>14 IU/kg</td>
<td>1-2 bottles adult</td>
<td>1 bag/6kg</td>
</tr>
<tr>
<td>2</td>
<td>Moderate bleed joint muscle, GIT, minor surgery</td>
<td>20 IU/kg</td>
<td>2-4 bottles adult</td>
<td>1 bag/4kg</td>
</tr>
<tr>
<td>3</td>
<td>Major bleed (e.g. cerebral)</td>
<td>40 IU/kg</td>
<td>4-6 bottles adult</td>
<td>1 bag/2kg</td>
</tr>
<tr>
<td>4</td>
<td>Prophylaxis for major surgery</td>
<td>60 IU/kg</td>
<td>6 – 10 bottles adult</td>
<td>1 bag/kg</td>
</tr>
</tbody>
</table>
**Note:**
For **Serial Number 1, 2, 3** above repeat dose 12 hourly if bleeding persists or swelling is increasing. With more severe bleeds it is usually necessary to continue treatment with half of total daily dose 12 hourly for 2-3 days, occasionally longer.
For **Serial Number 4**, start therapy 8 hours before surgery, continue 12 hourly therapies for 48 hours Postoperatively and if NO bleeding occurs, scale down gradually over next 3-5 days.
As adjunct to factor replacement in mucosal or gastro-intestinal bleeding and surgery give fibrinolytic inhibitor:
Tranexamic acid, oral, 500 - 1000 mg 8hourly. **DO NOT** use for haematuria.
In an emergency, fresh frozen plasma can be used to treat bleeding in haemophiliacs.

**Note:**
Avoid I.M injections
Avoid use of aspirin
Taking blood from femoral veins is absolutely contraindicated.

**16.2.3.2 Haemophilia B (Factor IX deficiency)**
**Description /clinical features:**
Haemophilia B is a chronic bleeding disorders caused by a lack of protein factor IX.

**Mild bleeding**
**Factor IX concentrate** 2 bottles (500 IU/bottle) in adults
Or
**Fresh frozen plasma (FFP)** 1 bag/15 kg body weight (4-5 bags for average adult)

**Major bleeding**
**Factor IX concentrate** 3-6 bottles (500IU/bottle) in adults
Or
Fresh frozen plasma (FFP) 1 bag/7.5 kg body weight (8-10 bags in adults).
Repeat in 24 hours if bleeding continues.
As adjunct to replacement therapy
Tranexamic acid, oral, 500 – 1000 mg, 8 hourly as for Haemophilia A
For children use appropriate proportions.
Factor VIII concentrate and cryoprecipitate are not useful for
Haemophilia B, so accurate diagnosis is essential.
Some Haemophilia A and B patients are on recommended dosage but
may require assistance form health personnel.

16.2.3.3 Von Willebrand Disease (VWD)
Description /clinical features:
Is a chronic bleeding caused by lack of clotting factor VWF.

Drug treatment:
Treat as for mild or moderate bleeding of Haemophilia A except that
the haemostatic dose may be repeated not 12 hourly but after 24 – 48
hours since therapeutic response is more sustained in VWD.

16.2.3.4 Acquired Bleeding Disorders/Platelet Disorders
Disseminated Intravascular Coagulation (DIC)
Description /clinical features:
Is a condition associated with thrombocytopenia, hypofibrininaemia
and low haemoglobin.

Non drug treatment:
Monitor prothrombin time (PT), international normalized ratio (INR),
activated partial thromboplastin (APTT), platelet count and fibrogen.
Identify if possible and treat/remove cause of DIC

Drug treatment:
If PT/APTT prolonged and patient is bleeding give,
- Fresh frozen plasma (FFP) 1 bag/15 kg body weight (4-5 bags in
  adults). Repeat FFP after 24 hours if indicated
If platelets count < 50000 and patient is bleeding give:
- Platelet concentrate 4-6 bags (adults)
If fibrogen is low and/or APTT prolonged give (to supply fibrogen and
FVIII):
- Cryoprecipitate 1 bag/6kg (8-10 bags in adults).
The use of heparin is NOT recommended in bleeding patients with
DIC

16.2.4 Haemorrhagic Disease of the Newborn
Description /clinical features:
This is due to a deficiency of Vitamin K dependant clotting factors
II, VII, IX and X. All new borns who did not received Vit. K at birth, especially premature babies and breast-fed babies are at risk. Spontaneous bleeding from any site usually gastro-Intestinal producing hematemesis or melena. Bleeding from umbilical stump, epistaxis and cephalohematoma/subgaleal hemorrhage are also relatively common.

**Drug treatment:**
The policy is to give vitamin K routinely to all newborns as a preventive measure. However, if haemorrhaging occurs, give Vitamin K, I.M, 1 mg once daily for 3 days

**Idiopathic thrombocytopenic Purpura (ITP)**
Prednisolone, oral, 1 mg/kg once daily, gradually reducing the dose over subsequent weeks. Consider splenectomy for those in whom steroids fail to achieve adequate control or who relapse after treatment.

**Anticoagulation**

**Duration of treatment**
Deep vein thrombosis (DVT): 6 – 8 weeks except in pregnancy, or if there is another reason for prolonged treatment
Pulmonary embolism (PE): 3 months
Atrial fibrillation: life long treatment
Heart valve prostheses: life long treatment.
After DC cardioversion, duration 4 weeks

**Heparin Treatment**

**Prophylaxis against DVT**
Following surgery and immobility e.g. cardiac failure:
Heparin 5,000 units, subcutaneous (S.C), 8 hourly until ambulant

**Treatment of DVT/PE**
Heparin 10,000 units, I.V, 6 hourly
Monitor APTT – aim for 2-3 times control
Continue until warfarin is effective, usually 3-5 days.
If facilities for monitoring APTT and INR are not available, DVT, may be treated with:
Heparin 10,000 units, subcutaneous, twice daily

**Or**
**Warfarin** after first trimester (12 weeks) keeping INR in the range 2-3.
At 32-34 weeks stop **Warfarin** and change to **Heparin** as above.
Caution: Warfarin may harm the foetus and should not be used under 12 weeks. Monitor closely whichever method is used. Specialist supervision is recommended.

Heparin Over dosage
If bleeding occurs, stop heparin and give:
• Protamine sulphate 1mg, slow I.V, neutralizes 100 units of Heparin.
  Maximum doses 50 mg (in excess protamine is also an anticoagulant).

Oral Anticoagulation
Warfarin 10mg, oral, loading dose, once daily for 2 days.
Check INR on 3rd day and dose accordingly.
The medicine should be taken at the same time each day.

Therapeutic range for Warfarin use DVT/PE: INR 2-3, heart valve prosthesis: INR 3-4.5
There is great individual variation in dose (average daily dose 3-9mg).
Monitor INR regularly, initially daily/alternate days then increase interval gradually to a maximum of 8 weeks. Reduce loading dose in elderly and in patients with renal/hepatic impairment.

Drug Interacting with Warfarin.
Caution: Drug interactions are common and can be dangerous
Below are few examples:
Warfarin Inhibition, Warfarin Potentiation Barbiturates, Alcohol, Oral contraceptives, Chloramphenicol, Griseofulvin, Cimetidine, Rifampicin, Erythromycin, Carbamazepaine, Co-trimoxazole, Vitamin K, Acetylsalicylic acid

Warfarin Overdosage:
If INR 4.5 – 7 without haemorrhage – withhold Warfarin for 1-2 days then review
If INR > 7 without haemorrhage – withhold Warfarin and check INR daily.
Consider giving:
Vitamin K 0.5 – 1 mg, slow I.V, (not I.M)
If INR>4.5 with haemorrhage, give:
Fresh frozen plasma (FFP) 2-4 bags then check INR and repeat infusion if bleeding continues.

**Plus**
Vitamin K , Slow I.V, 0.5 – 1 mg (higher doses Vitamin K will prevent adequate anticoagulation for up to 2 weeks).

**Streptokinase Treatment**
Life Threatening Myocardial infaction and Pulmonary Embolism/Arterial Embolism Streptokinase (I.V) loading dose of 250000 units over 30 minutes, then 100000 units every hour for 24-72 hours

| **Caution:** Allergic reactions may occur before infusion give: Hydrocortisone 100 mg (I.V). |
17.1 Diabetes Mellitus

*Description/clinical features:*

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia, due to deficiency or diminished effectiveness of insulin, or combination of both. Classical symptoms of diabetes are:

- Polydipsia
- Polyuria
- Loss of weight
- Lethargy,
- Pruritus vulvae
- Unhealed wound
- Impotence

Diagnosis must be confirmed biochemically (blood sugar test).

**Normal Value = 4.0 – 6.9 mmol/L**

**Types of Diabetes Mellitus:**

- Type 1
- Type 2
- Gestational Diabetes Mellitus (GDM)
- Other specific types of Diabetes

**Non Drug Treatment:**

- All patients require lifestyle modification.
- In patients with type 2 diabetes mellitus, appropriate weight loss if body mass index (BMI) exceeds 25
- Correct meal/energy distribution in type 1 diabetes mellitus
- Discourage Alcohol intake and smoking
- Increased physical activities
- Education for foot care
**Advice: (Monitoring)**

- Blood glucose at every visit
- HbA1c at every three to six months.
- Weight & Height (BMI) at every visit
- Blood pressure at every visit
- Urine for glucose, ketones and proteins
- Potassium, creatinine and lipids annually
- Fundoscopy annually
- Proteinuria annually
- ECG and Chest x-ray to be encountered annually
- Foot examination

<table>
<thead>
<tr>
<th>Biochemical Index</th>
<th>Optimal</th>
<th>Acceptable</th>
<th>Additional action suggested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cappillary blood glucose values (finger-prick) fasting (mmol/L)</td>
<td>4-6</td>
<td>6-8</td>
<td>&gt;8</td>
</tr>
<tr>
<td>2-hours post-pradial (mmol/L)</td>
<td>4-8</td>
<td>8-10</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Glycated haemoglobin (HbA1C) (%)</td>
<td>&lt;7</td>
<td>7-8</td>
<td>&gt;8</td>
</tr>
<tr>
<td>Weight: BMI (kg/m²)</td>
<td>&lt;25</td>
<td></td>
<td>&gt;27</td>
</tr>
</tbody>
</table>

**Referral criteria:**
- inability to achieve optimal metabolic control
- developed complications
- diabetes in pregnancy or GDM

**17.1.1 Type 2**

**Description/Clinical features:**
This is a type of diabetes which is characterized by insulin resistance and/or abnormal insulin secretion, either of which may predominate, but both of which are usually present. It is the most common type of diabetes. Commonly affect people of age above 40 years.
Risk factors include:

<table>
<thead>
<tr>
<th>MODIFIABLE</th>
<th>NON-MODIFIABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>Age above 40 years</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>First degree relative with diabetes</td>
</tr>
<tr>
<td>Impaired fasting glycaemia</td>
<td>Previous gestational diabetes</td>
</tr>
<tr>
<td>Dislipidaemia</td>
<td>Hypertension</td>
</tr>
</tbody>
</table>

The management includes:
- Treatment of hyperglycaemia
- Treatment of hypertension and dyslipidaemia after risk-assessment.
- Prevention and treatment of microvascular complications
- Prevention and treatment of macrovascular complications

**Drug Treatment:**

**Oral blood glucose lowering drugs**

Oral drugs are indicated when individualised glycaemic targets are not met by the combination of dietary modifications and physical activity/exercise.

In some cases, oral drugs are indicated at the first presentation of diabetes i.e. fasting blood glucose level of more than 15 mmol/l. These agents may be used as monotherapy or in combination therapy targeting different aspects in the pathogenesis of hyperglycaemia in type 2 diabetes mellitus, i.e. increased insulin production and release, decrease insulin resistance and/or decrease hepatic glucose production.

Monotherapy with any of the drugs should be the initial choice. Use of stepped-care approach is recommended to clinicians. Combination therapy using oral agents with different mechanisms of action is indicated if monotherapy with one of the agents has failed. When oral combination therapy fails, insulin should be added to the treatment regimen or replace the oral agents.
Secondary failure of oral agents is said to be common, i.e. 5–10% of patients annually. Metformin should be the first choice.

**Biguanides derivatives:**
- Metformin 500 mg, oral, daily
  Dose increments if the blood glucose is uncontrolled:
  Increase to 500 mg, 12 hourly after two weeks.
  Increase to 850 mg, 12 hourly after another two weeks if needed.
  Maximum dose: 850 mg, 8 hourly.

**Or**

**Sulphonylurea derivatives:**
- Gliclazide 40 mg, oral, daily with breakfast
  Dose increments if the blood glucose is uncontrolled:
  Increase with 40 mg daily at two-weekly intervals.
  Maximum dose: 160 mg 12 hourly.
  If 80 mg or more is needed, divide the total daily dose into 2.

**Contra-indicated in:**
- Patients with a serum creatine of >50 micromol/L
- Uncontrolled congestive cardiac failure
- Impaired liver function

**Insulin Therapy in Type 2 Diabetes**
See insulin protocols as in type 1 diabetes mellitus below.
Insulin therapy is indicated in:
- Patient presents with severe hyperglycemia
- Secondary failure with oral drugs, i.e. combination/substitution insulin therapy
- Peri-operative period especially major or emergency surgery
- Severe kidney or liver failure
- Pregnancy
- Latent autoimmune diabetes in adults

Oral agents should not be used in Type 1 diabetes, severe kidney and hepatic impairment.
The regimen and dose of insulin therapy vary from patient to patient. Two forms of insulin therapy are often used in combination with oral blood glucose lowering drugs:
- Intermediate or long acting insulin plus oral agents or
- Premixed combination of short acting with intermediate acting insulin.
At initiation of insulin therapy, appropriate advice on self-blood glucose monitoring (SBGM) and diet should be given.

**Note:**
Insulin requirements decrease in patience with chronic renal impairment. In these situations, blood glucose monitoring must be regularly (at least daily) performed in order to reduce the dose appropriately, reducing the risk of hypoglycaemia.

### 17.1.2 Type 1
**Description/clinical features**
This is a type of diabetes results from destruction, most commonly auto-immune, of pancreatic beta-cells. Commonly affect people of age 0-39 years. Insulin is required for survival

The management includes:
- Maintenance of glycaemic control within acceptable limits
- Prevention of chronic complications
- Prevention of acute complications, e.g. hyperglycaemic and hypoglycaemic coma

**Drug treatment:**
**INSULIN PROTOCOLS**
- **Short acting:** Soluble Insulin, S.C, three times daily, 30 minutes prior to meals
  Onset of action: 30 minutes.
  Peak action: 2–5 hours.
  Duration of action: 5–8 hours.
- **Long acting:** Lente Insulin, S.C, once or twice daily usually at night
  Onset of action: 1–3 hours.
  Peak action: 6–12 hours.
  Duration of action: 16–24 hours.
- **Mixed Insulin, biphasic, S.C, once or twice daily**
  Mixtures of short and long acting insulin in the proportion of 30: 70 respectively
  Onset of action: 30 minutes.
  Peak action: 2–12 hours.
  Duration of action: 16–24 hours.

**SELECTION OF INSULIN**
**Basal bolus insulin**
All type 1 diabetes should preferentially be managed with combined long-acting (basal) and short-acting soluble insulin (bolus), the so-
called basal bolus regimen. This consists of pre-meal short acting insulin and bedtime long-acting insulin not later than 22:00. The initial total daily insulin dose should be calculated as 0.6-units/kg body weight.

60% of the total daily dose (TDD) should be injected as short-acting (bolus) insulin before meals, e.g. if person has three equally sized meals per day.

Before breakfast 20%, before lunch 20% and 20% before supper. The remaining of 40% of the TDD should be injected as basal insulin, e.g. before bed time (22:00)

**Pre-mixed insulin (mixture of long and short acting insulin)**
Twice-a-day regimen: simple regimen to suit a more well organized lifestyle.

2/3 of TDD to be administered before breakfast. 1/3 of TDD to be administered before supper.

**INSULIN DELIVERY DEVICES**
Due to cost, prefilled disposable pens should be reserved for special categories of patients, e.g. visually impaired patients and patients on the basal bolus regimen.

**HOME GLUCOSE MONITORING**
- Patients on basal bolus insulin should measure glucose at least daily
- All type 2 patients on insulin should be given up to 25 strips per month for home glucose monitoring

**GLUCAGON**
Type 1 diabetes on tight control, i.e. basal bolus, who are judged to be at high risk of hypoglycaemia should have a glucagon hypoglycaemia kit and both the subject and the family should be educated how to use this emergency therapy.

**Note:**
During surgery omit the usual morning dose of insulin. Give small doses of short acting insulin during surgery and continue with short acting insulin until the patient has resumed his usual meals. Most diabetics properly informed and managed soon become experts in their own care. Be cautious about changing regimens and do not change dietary and drug regimens simultaneously. Infections may require increased dosage of insulin.
Follow up carefully when the patient returns home. Ensure any medications prescribed (especially insulin) are taken carefully. Review regularly to check the condition is stable.

Advice:
Ensure patient / relatives knows:
The symptoms/ signs of hypoglycemia: sweating, weakness, nausea, hunger, stomach cramps, headache, anxiety.

How to treat hypoglycemia:
If patient is conscious, advise to drink a cup of tea with two table spoon of sugar, or a glass of soda, or glucose immediately. If patient is unconscious, relatives should give sugar, glucose powder or honey, sublingually, then immediately send the patient to Hospital.

Referral criteria:
- Unstable diabetes
- Pregnancy in diabetes
- Recurrent hypoglycemia
- High blood pressure
- Infection, especially foot

Complications:
Diabetic shock (hyperglycemia), hypoglycemic shock (from over treatment), hypertension, infections, gangrene.

17.2 Diabetic Emergencies
17.2.1 Hypoglycemia

Description/clinical features:
An abnormally diminished concentration of Glucose in the Blood, below 3.9mmol/L, which may lead to cold sweat tremulousness hypothermia and headache accompanied by irritability, confusion, hallucination and ultimately convulsion and coma.

Drug Treatment:
Start immediately 50% Dextrose, rapid I.V Injection 50ml
Assess Clinical and biochemical response over the next 5-10 minutes
Establish a large bore intravenous line and keep open with dextrose 10% I.V
If no clinical response give a second injection of 50% Dextrose I.V 50 ml
Prevent recurrent hypoglycemia continue infusion with dextrose 10% I.V infusion, at a rate of 1litre in six hours.
Once blood glucose is normal or elevated and the patient is awake, check blood glucose hourly for several hours and check serum potassium for hypokaliemia
If I.V Glucose cannot be given for any reason give Glucagons I.M, 1mg blood will take 10-15 minutes to rise.
If the patient has not regained consciousness after 30 minutes with normal or elevated blood glucose look for other causes of coma.
Once the patient is awake give a snack and refers or admits to hospital for observation and for education to prevent further hypoglaecemic episodes.

**Recurrent hypoglycemia**
Consider the following in the case of recurrent hypoglycemia:
- Inappropriate management e.g. Too much insulin or too high dose of sulphonyl urea
- Poor compliance
- Alcohol abuse
- The advent of renal failure
- Hypoglycemic unawareness
- The honeymoon period of type 1 diabetes
- Pancreatic diseases, e.g肿瘤 of the pancreas.

Other causes of hypoglycemia should also be considered e.g. associated Addison’s disease or hypopituitarism.

Recurrent hypoglycemia may be the cause of hypoglycemic unawareness, which occurs frequently in Type I diabetic patients. The loss of warning symptoms can lead to severe hypoglycemia. Evidence exists that in some cases this situation can be restored to normal with avoidance of hypoglycemia.

**17.2.2 Diabetic Ketoacidosis (DKA)**
*Description/clinical features:*
Diabetic ketoacidosis (DKA) is a dangerous complication of diabetes mellitus in which the chemical balance of the body becomes far too acidic. Always results from a severe insulin deficiency
Diabetic Comas – Recognition and Clinical profiles

DKA is most commonly seen in individuals with type I diabetes and is usually caused by the interruption of their insulin treatment or by acute infection or trauma. A small number of people with type II diabetes also experience ketoacidosis, but this is rare given the fact that type II diabetics still produce some insulin naturally. When DKA occurs in type II patients, it is usually caused by a decrease in food intake and an increased insulin deficiency due to hyperglycemia.

- Blood glucose usually < 40;
- Blood ketones are positive
- Serum osmolality < 350 mOsm/L

Some common DKA symptoms include:

- high blood sugar levels
- frequent urination (polyuria) and thirst
- fatigue and lethargy
- nausea
- vomiting
- abdominal pain
- fruity odor to breath
- rapid, deep breathing
- muscle stiffness or aching
- coma

17.2.3 Hyperosmolar Nonketotic Coma (HONK)

Description/clinical features:

HONK is a syndrome characterized by impaired consciousness, sometimes accompanied by seizures, extreme dehydration and severe hyperglycemia, that is not accompanied by severe ketoacidosis. It usually occurs in the elderly type II diabetic and develops over days to weeks.

- Blood glucose usually > 40
- Blood ketones usually negative
- Serum osmolality > 320mOsm/L

Anion gap = Na – (Cl + HCO₃⁻) (N = ± 12 : DKA > 20
Calculated serum osmolality = 2 (Na + K) + glucose + urea (N = 275 – 285 mOsm/L)
Some common HONK symptoms include:

- Patients usually notice early symptoms of generalised weakness, leg cramps or visual impairment.
- Nausea and vomiting may occur but this is much less so than for diabetic ketoacidosis.
- As the condition progresses patients may become bed-bound, confused and lethargic.
- Focal neurological symptoms such as weakness on one side or hemisensory abnormalities may develop, and be easily confused with stroke.
- Seizures are present in up to 25% of cases, and can be generalised, focal, movement-induced or myoclonic-jerk type.
- Progression to an obtunded or coma state represents severe disease. Only about a tenth of patients with HONK actually suffer coma.

| Note: Up to a third of patients in some series did not have a history of diabetes. |

**Non drug treatment:**

**All patients**
- Setup an intravenous line.
- Protect airway and insert a nasal gastric tube, if unconscious.
- Monitor urine output.
- Plasma glucose and ketones, urine and electrolyte and venous blood gas.
- Look for precipitating causes, e.g. infection and Myocardial infarction (MI).

**Drug treatment:**

**Fluids Therapy**
Average deficit 6 lts, may be as much as 12 lts.
If renal or cardiac disease is present, monitor the central venous pressure.

- In the absence of hypertensive, renal or cardiac compromise:
  - 0.9% Sodium chloride (N/S), I.V, 15 – 20 ml/kg in the first hour. For patient under 20 years of age, initial volume: 10 – 20ml/kg in the first hour. Subsequent infusion rate varies from 5 – 15 ml/kg/hr depending on the clinical condition.
  - Correction of estimated deficits should take place over 24 hrs.
The volume infused in the first 4 hrs should not exceed 50ml/kg.

- If plasma Na+ > 140mmol/Lt:
  5% Dextrose or 5% dextrose in 0.9% sodium chloride (DNS)

**Note:** Adjust fluid volumes according to clinical criteria. If hypotension is still present after 2 hours, give 2 units of colloid.

**Insulin Therapy**

**SLIDING SCALE**

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 ml-mol/L</td>
<td>None</td>
</tr>
<tr>
<td>6-9 ml-mol/L</td>
<td>2</td>
</tr>
<tr>
<td>10-14 ml-mol/L</td>
<td>4</td>
</tr>
<tr>
<td>15-19 ml-mol/L</td>
<td>8</td>
</tr>
<tr>
<td>20-24 ml-mol/L and above</td>
<td>16</td>
</tr>
</tbody>
</table>

**Note:** To be administered *intravenously*

17.3 **Microvascular Complications (Target organ damage – Nerves, Kidneys, Eyes)**

**Description/clinical features:**

**Diabetic Neuropathies**

Neuropathies are common complications of diabetes. They play an important role in the increased morbidity and mortality suffered by people with diabetes.

There are three majors’ categories:

- Peripheral neuropathy
- Autonomic neuropathy
- Acute onset neuropathy

**Drug treatment:**

Improve glycaemic control.

Exclude or treat other contributory factors:

- Alcohol excess
- Vit B₁₂ deficiency, if suspected
- Uraemia
Pain
• Paracetamol 1g, oral, 6 hourly as needed
• Amitriptyline 10-25mg, oral, at night increasing to 75mg, if necessary

If ineffective, give
• Carbamazepine 100mg, oral, once daily, increasing to 200mg, 12hourly daily when required. Maximum up to three months

Gastroparesis
Metoclopramide 10mg, oral, 8 hourly before meal, if patient vomits use Metoclopramide 20mg, I.M, 8 hourly.

17.3.1 Diabetic Kidney disease
Description/clinical features:
Hypertension is a major factor in the development of kidney problems in people with diabetes. Diabetic kidney disease takes many years to develop. In some people, the filtering function of the kidneys is actually higher than normal in the first few years of their diabetes. People who are developing kidney disease will have amounts of the blood protein albumin leak into their urine (macroalbuminuria or proteinuria). Kidney damage rarely occurs in the first 10 years of diabetes, and usually 15 to 25 years will pass before kidney failure occurs. For people who live with diabetes for more than 25 years without any signs of kidney failure, the risk of ever developing it decreases.

Non drug treatment:
• Limit salt intake.
• Avoid high protein diet

Drug Treatment:
• Antihypertensive drugs
• Intensive management of blood glucose or glycemic control

Note:
People with diabetes experience kidney failure, must undergo dialysis or a kidney transplant.
17.3.2 Diabetic foot ulcer (Diabetic Foot)

**Description/clinical features:**
Diabetics are prone to foot ulcerations due to both neurologic and vascular complications. Peripheral neuropathy can cause altered or complete loss of sensation in the foot and/or leg. Similar to the feeling of a “fat lip” after a dentist’s anesthetic injection, the diabetic with advanced neuropathy loses all sharp-dull discrimination. Any cuts or trauma to the foot can go completely unnoticed for days or weeks in a patient with neuropathy. It’s not uncommon to have a patient with neuropathy tell you that the ulcer “just appeared” when, in fact, the ulcer has been present for quite some time. There is no known cure for neuropathy, but strict glucose control has been shown to slow the progression of the neuropathy.

**Non drug treatment:**
- Metabolic control and treatment of co-morbidity
- Relief pressure: non-weight bearing is essential
- Smoking cessation
- Local: frequent wound inspection and debridement

**Drug treatment**
Debridement with removal of all necrotic tissues

Antibiotic therapy:
Cloxacillin 2g, I.V, 6hourly

**Plus**
Metronidazole 400mg, oral, 8hourly

**How to prevent foot ulceration and amputation**
Advice about foot care is important: keep clean and dry, wear well-fitting shoes, and take care to avoid burns.
- Optimize blood glucose, blood pressure and lipid control.
- Help patient to stop smoking
- Perform a detail foot evaluation at presentation and annually
- People with demonstrated risk factors should be examine every six months
- If there is no symptom, it does not mean that the feet are healthy, since the patient can have neuropathy, peripheral vascular disease or even an ulcer without any complaints.
**General Advice for Diabetics**
All diabetic patients should be advised to join the Diabetic Association of Zanzibar.

**Insulin Storage**
Insulin should be stored in a cool dry place.

**Injection technique**
Clean and dry skin. Inject subcutaneously **NOT** intradermally. The site of injection should be varied (abdomen and thighs are the most suitable sites).

17.4 **Hypothyroidism**

*Description/clinical features:*
Deficiency of thyroid activity; in adults, it is most common in women and is characterized by decrease in basal metabolic rate, fatigue and lethargy, sensitivity to cold, and menstrual disturbances.

**Causes:** Primary hypothyroidisms are thyroiditis, post surgery and post-radiodine:

Secondary hypothyroidism may be due to any cause of anterior hypopituitarism.

**Symptoms:**
- Fatigue
- Weakness
- Weight gain or increased difficulty losing weight
- Coarse, dry hair
- Dry, rough pale skin
- Hair loss
- Cold intolerance (can't tolerate the cold like those around you)
- Muscle cramps and frequent muscle aches
- Constipation
- Depression
- Irritability
- Memory loss
- Abnormal menstrual cycles
- Decreased libido

**Investigations:**
Thyroid Stimulating Hormones (TSH) and T4 initially and for monitoring adequacy of therapy
**Drug treatment:**
If TSH is high, while T4 is low = Hypothyroidism
New born: 1-5 days:
• Levothyroxine 25mcg, oral, daily;
  6days – 1 year:
• Levothyroxine 50 mcg, oral, daily;
Above 1 year:
• Levothyroxine, oral, 4-6 mcg/kg body weight daily.
Recheck after 1 month: If TSH is still high, while T4 is low = Underdose
If T3, T4 are high, TSH is low = Overdose

**Advice:**
• If there is a risk of ischemic heart disease, start at 25mcg daily and increase by 25mcg every 4 weeks
• Check TSH and T4, after 1 month and adjust dose if required.
• TSH level will take several month to stabilize.
• Once stable check T4 and TSH annually.

**17.4.1 Hypothyroidism in Pregnancy**

*Description/clinical features:*
About 60% of hypothyroid in pregnant women need an increase in thyroxine therapy in the second and third trimesters.

*Drug treatment:*
Check TSH monthly and increase Thryoxine dose to keep serum TSH level normal. After delivery, revert to pre-conception doses.

**17.5 Hyperthyroidism**

*Description/clinical features:*
The thyroid is a gland in the neck that produces two thyroid hormones, thyroxine (T4) and triiodothyronine (T3). Thyroxine is inactive and is converted by the tissues and organs that need it into tri-iodothyronine. The role of thyroid hormones, put simply, is to regulate the metabolism of virtually all cells in the body.

When the thyroid gland becomes affected by disease, sometimes the production or release of thyroxine and tri-iodothyronine can be abnormally high, leading to increased levels in the blood; a state of thyroid overactivity known as hyperthyroidism or thyrotoxicosis. Symptoms and signs of hyperthyroidism includes fatigue, heat intolerance, sweating, weight loss despite good appetite, shakiness,
inappropriate anxiety, palpitations of the heart, shortness of breath, tetchiness and agitation, poor sleep, thirst, nausea and increased frequency of defecation

**Investigation**
Request TSH and T4. If TSH suppressed and T4 normal, request in addition T3. The usual biochemical abnormalities, however, are:

**Diffuse goiter with bruit (Graves’)**
Ophthalmopathy
Pretibial myxoedema
Family history

**Thyroiditis**
Toxic multinodular
Goiter small to large
Older patients
Obstructive surgery
Cardiac manifestations

**Thyroid nodule**
Moves on swallowing.
If diagnosis is uncertain: request thyroid uptake scan: If uptake is:
- elevated or diffuse: Graves’ hyperthyroidism
- markedly decreased: Thyroiditis
- patchy, normal or increased: Toxic multinodular goiter

**Drug treatment:**
- Carbimazole 30–45mg, oral, once daily
  Titrate dose according to thyroid hormone levels (T4).
  Duration of therapy: 12–18 months.

**β-blockers**
Used to counteract excessive sympathetic symptoms, e.g. palpitations.
Dose is titrated by the heart rate.
Give for 2–4 weeks.
- Propranolol 20–40mg, oral, twice daily
  Titrate dose upwards as needed.
**Or**
- Atenolol 50mg, oral, daily
Radioactive iodine
In the setting of Graves’ disease radioactive iodine may be administered for failed medical therapy and may be indicated for patients with coexistent heart disease.
It is contraindicated in active thyroid associated ophthalmopathy.

Surgery
Consider if the thyroid is very large or if there is failure of antithyroid drug therapy.

Monitoring
Patients with Graves’ disease who are treated with antithyroid drugs should be monitored every 6–8 weeks using a serum T4. TSH may remain suppressed for months.
Once in remission, patients may be monitored less frequently to determine signs and symptoms of recrudescence of thyrotoxicosis.
Because there is a risk of neutropaenia with carbimazole, a FBC must be done in patients presenting with an infection or sore throat.
Post-radioiodine TSH and T4 should be checked at 6 weeks, 3, 6, 9 and 12 months and annually thereafter until either hypothyroidism occurs or patient remains euthyroid for ± 3–4 years. Although uncommon, hypothyroidism can occur years later.

Referral criteria:
• Consultation with a specialist is recommended in all cases
• For thyroid scan if necessary
• Thyroid associated ophthalmopathy
• When radioactive iodine or surgery is contemplated

17.6 Osteoporosis
Description/clinical features:
Reduction in the amount of bone mass and micro-architectural bone deterioration leading to bone fragility and increase in fracture risk after a minimal trauma

Non-drug treatment:
Adequate energy and protein intake
Adequate dietary calcium intake particularly in the young, in breast feeding mothers and in the elderly mothers
Weight bearing exercises e.g. brisk 30minutes walk 3 times a week
Smoking cessation
Avoid excessive alcohol
Avoid falls (avoid sedative drugs esp. in the orderly, manage visual, mental and/or balance impairment, weakness, sarcopenia, environmental hazards, history of falls)

**Drug treatment:**
Calcium Supplementation
Vitamin D supplementation
Hormone Replacement therapy
18.0 EAR, NOSE AND THROAT DISEASE CONDITIONS

18.1 Otitis

Description/clinical features:
This is an inflammatory condition of both the external auditory meatus and/or the middle ear. The clinical features are itching and pain in the dry, scaling ear canal. There may be a water or purulent discharge and intermittent deafness. Pain may become extreme when the ear canal becomes completely occluded with edematous skin and debris. In otitis media (acute) the clinical features are ear pain, a sensation of fullness in the ear and hearing loss, aural discharge. Onset usually follows an upper respiratory tract infection. Chronic otitis media is associated with perforation of the eardrum, normally if is painless, and no fever.

18.1.1 Otitis Externa

Non Drug Treatment:
• Exclude an underlying chronic otitis media before commencing treatment
• Instruct the patient to thoroughly clean and dry the ear. (aural toilet)
• Prevent water from entering the ear for 14 days.

Drug Treatment:
Adult and children:
Candibiotic eardrops 1-2 drops, 6 hourly after cleaning and drying the ear for 14 days.

18.1.2 Otitis Media

Description/clinical features:
(a) Acute otitis media: Acute purulent exudates in the middle ear with discharge (acute suppurative otitis media)
(b) **Secretory otitis media** Multifactorial non-purulent inflammatory condition in the middle ear without discharge. Also a residual condition after acute otitis.

(c) "**Chronic suppurative otitis media**" A child having ear discharge for more than 14 days or with recurrent ear discharge with perforated ear drum.

Acute otitis media usually follows a viral infection; the bacterial infection is caused by:
- Pneumococci
- Haemophilus influenzae
- Group A streptococci
- Moraxella catarrhalis

**Symptoms:**

*Acute otitis media*
- Previous common cold
- Pain
- Restlessness
- Usually feverish
- Hearing often reduced
- Possible discharge of pus from ear

*Secretory otitis Media*
- Little or no pain
- Gradual loss of hearing
- “Popping” in the ear (rarely)
- Often discovered by reducing hearing.

**Drug Treatment:**
Symptomatic treatment of acute otitis media and simplex otitis
Analgesics: Paracetamol 10 mg/kg body weight every 6-8 hours,
Elevation of the upper part of the body
Decongestive nasal drops or nasal spray e.g. Ephedrine hydrochloride
Oral decongestants and antihistamines are not indicated.

**Treatment of Acute Otitis**
It should be treated with antibiotics.

**First choice:**
- **Adult:** Amoxycilin 500 mg, oral, 6 hourly for 5 days
- **Children up to 5 years:** 6 mg/kg, 6 hourly for 7 days
- **6-12 years:** 250mg, 6 hourly for 7 days
Note: Treatment periods shorter than five days increase the risk of treatment failure

Second choice:
Erythromycin if allergic to penicillins
Adult and children above 8 years 250 – 500 mg, 6-8 hourly for 5 days

Referral criteria:
Children with high fever who are toxic affected or children with severe pain that persists in spite of treatment
Treatment failure without improvement after change of antibiotics.
Otitis in the normal (or better hearing) ear combined with permanent hearing loss in the other ear.

Treatment of Secretory otitis
Initial inspection
Nasal drops, oral decongestants and antihistamines can be given on this conditions Secretory otitis with hearing loss that does not improve should be referred to a specialist.

18.2 Acute Rhinitis and Sinusitis
Description/clinical features:
Rhinitis is caused by a variety of viruses. Acute sinusitis starts with obstruction of the ostium, followed by reduced ventilation, retention of discharge and bacteria multiplication. If the ostium is blocked for a longer period, sinus empyema may occur. The bacteria most often causing purulent sinusitis are pneumococci and *Haemophilus influenza* which in some studies are shown to be equally common. *Moraxella catarrhalis* and group A streptococci also occur. In sinusitis of dental origin, anaerobic bacteria are often found.

Acute rhinitis: A viral inflammatory condition in the nasal mucous membrane, usually part of a more wide-spread infection of the upper respiratory tract.
Acute purulent sinusitis: Bacterial infection with pus accumulation in one or more of the sinuses
Acute serous sinusitis: An inflammation in one or more sinuses with fluid accumulation but without pus formation.
**Drug Treatment:**

**Acute Rhinitis and serous sinusitis**
- Elevation of the head
- Nasal drops or spray e.g. steroid nasal drugs for children.
- Beclomethasone spray for adult.

**Purulent Sinusitis**

**Symptomatic Treatment**
- Elevation of the head
- Nasal drops or spray e.g. Ephedrine hydrochloride 1% for adult and 0.5% for children or Beclomethasone spray. 1-2 drop/puffs, 8 hourly for 3 days
- Oral drugs to reduce swelling of the mucous membrane or anti-histamines are not indicated.

**Drug treatment:**

**Adult:** Phenoxymethylpenicillin 250 – 500mg, oral, 6 hourly for 10 days
**Children up to 5 years:** Phenoxymethylpenicillin, oral, 6 mg/kg, 6 hourly for 10 days
**5 – 12 years:** 250mg, 6 hourly for 10 days

**Or**

**Adult:** Amoxycillin 500mg, oral 8 hourly for 10 days
**Children Up to 10 years:** 10 mg/kg, 8 hourly for 10 days

**Second choice:***

**Adults:**
Ampiclox 500mg, 8 hourly for 10 days
**Children Up to 10 years:** 10 mg/kg, 8 hourly for 10 days

**Or**

**Adults:** Erythromycin 500mg, oral, 6 hourly
**Children:** 25 - 50mg/kg, 6 hourly for 10 days

**Referral criteria:**
Children with ethmoiditis present as an acute peri-orbital inflammation or orbital cellulitis must be hospitalized immediately
Adults with treatment failure and pronounced symptoms
If sinusitis of dental origin is suspected
Recurrent sinusitis, >3 times a year
Cases where sinus puncture or operation may be indicated.
18.3 Pharyngotonsillitis

Description/clinical features:
It is an acute inflammation of the pharynx and/tonsils, characterized by fever and pain.
Pharyngotonsillitis is caused by virus or bacterial. Most cases of Pharyngitis are caused by viruses and do not require treatment with antimicrobials. Clinical important pathogens are groups A betahaemolytic Streptococci and Epstein – Barr virus (EBV) in practice group A beta-haemolytic Streptococci is an indication for treatment with antibiotics.

Drug treatment:
Group A beta-haemolytic streptococci Infections
As general rule pharyngotonsillitis caused by group A beta-haemolytic streptococci should be treated with antibiotics.
If treatment is begun early, duration of the illness can be shortened. Antibiotics can hinder the spread of infection and reduce the risk of complications.

First Choice:
Adults: Amoxycillin 500mg, 8 hourly for 10 days
Plus
Paracetamol 10 mg/kg body weight, 8 hourly until fever controlled
Children: See under treatment of purulent sinusitis
Plus
Paracetamol 10 mg/kg body weight, 8 hourly until fever controlled.

Second choice:
Adults and Children over 8 years: Erythromycin 250 – 500mg, oral, 8 hourly for 10 days
Children up to 8 year: Erythromycin, oral, 10 mg/kg, 8 hourly for 10 days
Plus
Paracetamol 10mg/kg, 8 hourly for 10 days

Note:
Duration of treatment is 10 days. Shorter treatment period increases risk of therapy failure
Follow up:
• After 5 days in order to make sure patient is improving.
• Children must take the medicine properly in order to prevent complications such as rheumatic fever.

Referral criteria:
• Signs of abscess formation in one or both tonsils.

18.4 Laryngitis
Description/Clinical features:
This is an acute infectious inflammation in the larynx. The etiologic agent is normally a virus. Viral infection may give rise to bacterial superinfection. The picture of the disease is different in children and adults. Acute subglottic laryngitis (pseudocroup) occurs mainly in children under the age of seven. Edema of the mucous membrane of the subglottic space causes breathing difficulties, especially on inspiration. Laryngitis in Children may require active treatment.

Non drug treatment:
• Parents should behave calmly and avoid frightening the child
• Raise the upper part of the body
• Keep the air damp and cold
• Give extra fluid
• If symptoms persist or worsen, seek medical advice

Drug treatment:
• Epinephrine (Adrenaline) inhalation effectively reduces symptoms, but the effect may be short – lived

Dosage:
Preparation of racemic Epinephrine solution for inhalation

Hospitalization:
• If severe symptoms persist or worsen or recur after Epinephrine inhalation hospitalization is indicated
Treatment guidelines of laryngitis in older children and adults

<table>
<thead>
<tr>
<th>Age</th>
<th>Recemic Epinephrine (20mg/ml)</th>
<th>0.9% Saline</th>
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</thead>
<tbody>
<tr>
<td>0-6 months</td>
<td>0.1 ml</td>
<td>2 ml</td>
</tr>
<tr>
<td>6-12 months</td>
<td>0.15 ml</td>
<td>2 ml</td>
</tr>
<tr>
<td>&gt;12</td>
<td>0.2 ml</td>
<td>2 ml</td>
</tr>
</tbody>
</table>

Note: The total fluid volume is inhaled in 5 minutes with the use of inhaler

Symptomatic Treatment:
- Voice rest
- Ban smoking
- Antitussive
- Nasal drops or sprays
- Extra fluid intake

Treatment with antibiotics
Not indicated

18.5 Acute Epiglotitis (AE)

Description/clinical features:
Acute infectious inflammation of the epiglottitis, supraglottic and hypopharynx.
Epiglottitis is a potentially lethal disease. Oedema of the epiglottis may cause acute airway obstruction.
Epiglottitis occur both in children and adults. *Haemophilus influenzae* is often the cause.
AE is characterized by throat pain, difficult swallowing, drooling, husky voice, fever often high and with chills, patients prefer sitting posture, laborious inspiration, cough in some cases and anxiety.
**Note:**
When epiglottitis is strongly suspected, the patient should be referred immediately to a specialist for hospitalization without further examination, as incision of the throat may be dangerous.

**Non Drug Treatment:**
Immediate hospitalization
Transport the patient in sitting, with oxygen supplementation
Be prepared to treat respiratory failure (intubation or tracheotomy)

**Drug treatment:**
Antibiotics may be given if transport lasts more than one hour.

18.6 **Adenoid hypertrophy.**
Occurs in children under the age of 5 due to recurrent URTI and allergy.

**Symptoms:**
- Snoring
- Mouth breathing
- Chronic rhinorrhea

**Signs**
Lateral soft tissue neck X-ray will show obstruction/ narrowing of the nasal cavity

**Treatment**
Nasal steroid
Probeta-N, Budenase nasal spray
Antihistamine

**Complication.**
Failure to thrive
Sleep apnea
Corpulmonale
Adenoid facies
Recurrent otitis media / otitis media with effusion

**All these are indication for surgery. Refer the patient early as possible.**
19.0 MEDICAL EMERGENCIES

19.1 Shock

*Description/clinical features:*
A condition of profound hemodynamic and metabolic disturbance characterized by failure of the circulatory system to maintain adequate perfusion of vital organs. The patient may present the following symptoms:
- Decreasing Blood Pressure
- Increasing pulse rate/decreasing volume
- Increase Capillary filling time
- Increasing Respiratory rate
- Possibly high fever and signs of infection
- Drowsiness, which may develop into coma
- Cold sweats

There are several causes of shock. This include the following:

1. Extreme blood loss (internal or external) – hemorrhagic shock.
2. Severe fluid loss (severe diarrhoea, burns) – hypovolaemic shock
4. Severe allergic reaction – Anaphylactic shock
5. High blood sugar – Diabetic (Hyperglycemic) shock
6. Low blood sugar – hypoglycemic shock

19.1.1 Haemorrhagic shock

*Description/clinical features:*
Loss of intravascular fluid, e.g. dehydration, haemorrhages or fluid shifts.
Non-drug treatment:
Control obvious bleeding with direct pressure. Do not use tourniquets
Insert one or two large bore I.V catheters, peripheral lines are adequate

Drug treatment:
INITIAL VOLUME RESUSCITATION
0.9% Normal Saline, I.V, 1-2lts
Monitor BP, pulse and clinical response,

Most patients will respond to initial fluid bolus.
If they respond initially and subsequently deteriorate there may be an ongoing occult haemorrhage.
If no response occurs, consider:
Occult exsanguinating haemorrhage: Intra-abdominal, retroperitoneal and intrapleural.
Non-hypovolaemic shock: tension pneumothorax, myocardial contusion or M.I

CONSIDERABLE HAEMORRHAGE
Blood transfusion is indicated
Transfer to an appropriate unit once stable

19.1.2 Hypovolaemic shock

19.1.2.1 Septic shock
Description/clinical features:
It is a shock due to the presence and persistence of Pathogenic microorganism or their toxins in the blood.

Drug Treatment:
Adequate fluid resuscitation of up to 6 liters in the first 6 hours
Additional inotropic support such as Digitalis, Dobutamine, Betablockers as appropriate)
A central venous line to monitor fluid
Adrenalin, I.V infusion, 2-10 mcg/minutes
Dilute 4 ampoules of adrenalin 1mg/ml (in 200ml Sodium Chloride 0.9% and infuse at 5ml/hour (2mcg/min)
Plus
Appropriate antibiotic such as
Crystalline penicillin (50,000 IU/kg) single done I.V
Or
Procaine penicillin 50,000 IU kg single dose I.M
Treat for cerebral malaria as well.

Referral criteria:
Transfer urgently. Monitor and control shock.

19.1.2.2 Anaphylaxis/Anaphylactic shock
Description/clinical features:
An acute, potentially life-threatening hypersensitivity reaction
starting from seconds to minutes after administration of/or exposure
to a substance to which the individual has been sensitized. Clinical
manifestation range from mild urticaria and angioedema to upper
airway obstruction bronchospasm, hypotension, shock and death
The reaction can be short-lived, protracted or biphasic, i.e. acute with
recurrence several hours later. Immediate reactions are usually the
most severe and/or life threatening.

Non-drug treatment:
Cardiopulmonary resuscitation
Maintain and open airway, intubate if necessary
Monitor all vital parameters closely
Check pulse and blood pressure
Reassure and comfort patient
Patient counseling to prevent the recurrence
Medical alert bracelet should be worn at all times

Drug treatment:
Administer adrenaline and hydrocortisone early to prevent circulatory
collapse and severe bronchospasm

Intravenous fluids
Establish a large bore canular (FG 16 OR 18) intravenous line and keep
open with:
0.9% Normal saline, I.V

If I.V access not possible, administer the first dose of adrenaline I.M.
Adrenalin 1:1000 solution, I.M, 0.3-0.5ml by deep I.M injection. **Not subcutaneously**

**Or**

Adrenaline, I.V, 3-5ml of 1:10,000 solutions
Give very slowly. Start with 1ml then repeat after every minute
Maximum dose: 1mg/dose or 5mg/day
To make a 1:10,000 solution: dilute 1ml in 9ml Normal Saline 0.9%

**Plus**

Hydrocortisone 200mg, I.V, immediately

**Plus**

For bronchospasm
Oxygen at least 40%
Salbutamol, nebulised, 2.5-5mg undiluted given over 3 minutes
Repeat 4-6 hourly.

For severe allergic reaction, after resuscitation:
Prednisolone oral 0.5mg/kg daily for 10 days

For urticaria, after resuscitation:
Chlorpheniramine 4mg, oral, as a single dose

Observe all patients for at least 4-6 hours after stabilization

19.2 **Foreign body**

19.2.1 **Foreign body in throat**

*Description/clinical features:*
This usually caused by food, especially fish bones, getting caught in the throat. It may result from a child swallowing a toy.

*Non drug treatment:*
Ensure the patient has an airway. If not, try to dislodge the foreign body by slapping the patient on the back. Try the Heimlich manoeuvre. If this fails, an emergency tracheotomy is required. Proceed to do this if you know how.

Once an airway is established, examine the throat in good light. If the foreign body can be seen, and is easily removable, take it out with forceps. (Children will have to be properly positioned and restrained.)
Fish bones often catch in the tonsil and are easily removed.
**Prevention:**
Supervise young children when eating and playing
Take care when eating fish and other bonny foods

**Referral criteria:**
Any foreign body that cannot be easily removed.

**Complications:**
Infection can occur where the throat has been damaged by the foreign body or attempts to remove it.

19.2.2 Foreign body in ear

**Description/clinical features:**
Usually seen in young children, who insert objects, e.g. vegetables, toys in their ears.

**Non drug treatment:**
Examine ear in good light (Child will need to be properly positioned and restrained). If easily accessible, gently remove foreign body using ENT kit; if not available refer the patient.

**Prevention:**
Education and proper supervision of young children.

**Caution:**
“BE VERY CAREFUL” Permanent damage may occur to the ear if foreign body removed traumatically.

**Follow up:**
Review after 5 days to check if there is no secondary infection.

**Treat with oral antibiotic:**

**First Choice:**
Adult: Cloxacillin 500mg, oral, 6 hourly for 7 days
Children: Cloxacillin, oral, 50 mg / kg, 6 hourly for 7 days

**Second Choice:**
Adult: Erythromycin 500mg, oral, 6 hourly for 7 days
Children: Erythromycin oral, 50 mg / kg, 6 hourly for 7 days
19.3 **Snake bites**

**Description/clinical features:**
Contact with snakes, scorpions and other insects result in two types of injuries:
Those due to direct effect of venom on victim and those due to indirect effect of poison e.g. hypersensitivity reaction to bee sting.
Most snake bites are by non-poisonous snakes. Poisonous snakes include cobras and mambas (Elapidae).
Sea snakes (hydrophidaceae) and the boomslang and vine snakes (columbidae) Snake bites are fairly common in rural Zanzibar. Clinical condition depends on the type of snake bite and amount of poison (venom) injected. Hence envenomation (poisoning) will be neurotoxic in Cobras and Mambas and sea snakes and haemotoxic in Vipers and Boomslang.

**At lower level of Health Care Delivery**
Wash the skin to remove residual venom.
Snake venom spat into eyes must be washed thoroughly with water
Emergency treatment by bandaging affected limb with a crepe bandage without compromising blood supply
Reassure the patient; Snake bite causes a lot of anxiety.
Transport to hospital urgently.

**Note:**
1. Do not apply a tourniquet
2. Sucking or cutting the wound has not been found to be of any benefit

**Non drug treatment:**
- Reassure the patient
- Clean bitten site with clean water to remove any poison and remove any fangs.
- Remove any tourniquets and assess degree of envenomation.
- In severe envenomation by vipers rapid leg swelling from hemorrhage into anterior, compartment of lower limb may contain as much as 2 units of blood
**Drug treatment:**
Rarely there will be a need to use specific antivenom
When indicated (by the degree of envenomation) use polyvalent anti-
snakes venom (PAV)

Infuse 80-100ml of (PAV) diluted in 500ml normal saline and start drip
very slowly
Watch for hypersensitivity reaction and be prepared with already
drawn out 100mg hydrocortisone and Adrenaline. If reaction occurs,
stop drip and give Hydrocortisone and Adrenaline and restart drip
after 1 hour and again watch for reaction.
Debridement of necrotic tissue where necessary.

**Note:**
Reaction is from horse serum contained in the polyvalent serum
Dose of polyvalent serum will depend on degree of envenomation.
Same for both adults and children. The SAMRI variety of polyvalent
is best compared to others. Use polyvalent since often the type of
snake is unknown. There are specific monovalent sera where type
of snake is known.
Analgesics, antihistamines, blood letting are all absolute. With
reassurance, competent clinical observation, very few cases need
active treatment since envenomation is rare.

19.4 Injuries

19.4.1 Burns

**Description/clinical features:**
Skin and tissue damage caused by
-Exposure to extremes of temperature
-Contact with an electrical current
-Exposure to a chemical agent
-Radiation
## ASSESSMENT OF BURNS

<table>
<thead>
<tr>
<th>Depth of burn</th>
<th>degree</th>
<th>Surface/color</th>
<th>Pain sensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superficial (Partial loss of skin)</td>
<td>1st</td>
<td>Dry, minor blister, erythema</td>
<td>Painful</td>
</tr>
<tr>
<td>Partial A (Superficial dermal)</td>
<td>2nd A</td>
<td>Blisters</td>
<td>Painful</td>
</tr>
<tr>
<td>Partial B (Deep dermal)</td>
<td>2nd B</td>
<td>Moist white slough, red mottled</td>
<td>Painful</td>
</tr>
<tr>
<td>Full thickness (Deep/complete loss of skin)</td>
<td>3rd</td>
<td>Dry, charred whitish</td>
<td>Painless</td>
</tr>
</tbody>
</table>

### Non-drug treatment:
- Remove smouldering or hot clothing
- Immerse the burnt area in cold tap water to limit the extent of the burn
- Clean and dress wounds appropriately.
- Early intubation if hypoxia or drop in oxygen saturation and ventilation or if soft tissue swells, as these patients frequently tend to develop respiratory failure.
- Support vital organ function.
- I.V access should be obtained to administer intravenous fluids in e.g shocked patients.
- Look for aggravation comorbidity, e.g. seizures, hypokalaemia and renal failure.
- Clean superficial burns can be managed by occlusive dressings.
- Do not use ‘burnshied’ on full thickness wounds and on extensive surface area wounds.
- While waiting to transfer to the burn centre, cover wound with cling wrap

Rehabilitation
Drug Treatment:
- Intravenous fluids
- If required as soon as possible
- 0.9% Normal Saline, I.V
- Calculate fluid requirement per 24 hours

\[
\text{weight } \times \% \text{ of surface burnt } \times 2 = \text{quantity of fluid}
\]

- Give 75% of fluid requirement as sodium lactate compound solution and 25% as 6% Dextran 70 as blood/plasma expanders. Give first half in 8 hours and the rest within 24 hours.
- Give adequate analgesia especially at change of dressing
- Give antibiotics whenever indicated- Procaine Penicillin 1.2 MU I.M every 24 hours

Or

Adults: Erythromycin 500mg, oral, 6 hourly
Children: 25 - 50mg/kg, 6 hourly for 5-7 days

Immunisation, primary or booster:
TT vaccine 0.5ml I.M immediately

Burn dressing
Povidone Iodine
Or
1% Silver Sulphadiazine
Cover with paraffin Gauze

GASTRIC ULCER PROPHYLAXIS, particularly in 2\textsuperscript{nd} and 3\textsuperscript{rd} degree burns

Referral criteria:
- Burns>15% body surface area (BSA) or >10% BSA if over 50% years
- burns of face, hands, feet, genitalia, perineum or involving joints
- Electrical burns, including lightning burns
- Chemical burns
- Inhalation injury or burns
- Burns associated with major trauma
19.4.2 Head injury

**Description/clinical features:**
This is the result of head trauma and may present in a number of ways, such as contusion, concussion and compression.

**Management:**
If the patient is unconscious, manage as for the unconscious patient. Assess and treat for other injuries, bleeding, shock etc, and refer urgently to hospital.
If the patient is conscious, but less than normal, assess and treat for other injuries, bleeding, shock etc, and refer urgently to hospital.
If the patient is conscious assess and treat injuries.
Monitor conscious state carefully for 6 hour in the unit.
If conscious state deteriorates or there or there are other indications (other serious injuries), refer urgently to hospital.
If fully conscious after 6 hour and the patient is otherwise stable:
Send home with a relative and with instructions to return if any warning signs develop: drowsiness, loss of consciousness, fitting, disturbed vision, increasing headache, paralysis, numbness, tingling, etc. or patient’s condition deteriorates in any way. Review the following day

**DO NOT GIVE ANALGESIA TO PATIENTS WITH HEAD INJURY AS THIS MAY MASK COMPLICATIONS**

**UNCONSCIOUS PATIENT.**

**Non Drug treatment:**

**First Aid**
Place the patient in coma position (lying down on their side) to prevent vomit being inhaled (if the patient vomits).
Ensure the patient has an airway. Clear the mouth. (Be careful if patient fitting, you might get bitten).
Ensure the patient is breathing. If not give mouth-to-mouth resuscitation (or use a bag and mask if available).
Check the pulse. If no pulse (no heart beat) give cardiac massage.
Once the patient has an airway, breathing and circulation (pulse), try to establish the cause of the unconsciousness. Treat the underlying cause if possible.
Transfer the patient urgently. Keep the patient in the coma position. Continue giving artificial breathing and heart massage as long as necessary.
20.0 NUTRITIONAL DISORDERS

20.1 Avitaminosis

20.1.1 Vitamin A Deficiency

*Description/clinical features:*
Deficiency of vitamin A (retinol) is associated with ocular defects (particularly xerophthalmia) and an increased susceptibility to infections.
The most common clinical features of Vitamin A deficiency are: night blindness, photophobia, conjunctival xerosis, bitot’s spots, corneal xerosis, corneal ulceration and keratomalacia.

*Drug Treatment:*
Vitamin A:
- **0 – 1 year:** 100,000 IU, orally on days 1, 2, 7 and 14
- **Above 1 year:** 200,000 IU, orally on days 1, 2, 7 and 14

*Advice:*
Get diet reach in vitamin A such as green vegetables, carrot

*Advice:*
Keep eyes clean. Wash twice daily with clean water

*Follow up:*
After 3 days, 7 days and 14 days to make sure that the lesions are healing and there is no infection. If infection develops treat for conjunctivitis.

*Referral criteria:*
Perforation of eyeball
Cornea remains cloudy despite treatment.
20.1.2 Vitamin D Deficiency

Description/clinical features:
Vitamin D deficiency occurs when the concentration of 25-hydroxy-vitamin D (25-OH-D) in the blood serum occurs at 12 ng/ml (nanograms/milliliter), or less. The normal concentration of 25-hydroxy-vitamin D in the blood serum is 25-50 ng/ml. When vitamin D deficiency continues for many months in growing children, the disease commonly referred to as rickets will occur. A prolonged deficiency of the vitamin in adults results in osteomalacia. Both diseases involve defects in bones.

Non drug Treatment:
Prevent deficiency by exposing skin to sunlight

Drug treatment:
• Rickets heals promptly with 4,000 IU of oral vitamin D per day administered for approximately one month.

• Osteomalacia is treated by eating 2,500 IU per day of vitamin D for about three months.

20.1.3 Nicotinic Acid Deficiency (Pellagra)

Description/clinical features:
Pellagra is a disease due to deficiency of Niacin (nicotinic acid), one of the components of the vitamin B-complex in the diet.

Drug Treatment:
Adult: Nicotinamide 100 mg, oral, 6 hourly for 7 days followed by a multivitamin preparation containing 50 - 60 mg of nicotinamide daily for one month.
Children: 10-25mg, 8 hourly for 7 days followed by multivitamin preparation as above.
Advice:
Get diet reach rich in Niacin such yeast, organ meats, peanuts and wheat germ.

20.1.4 Thiamine Deficiency (Beriberi)

Description/clinical features:
The primary disease of thiamine deficiency is beriberi. There are four principal types; acute and wet beriberi; infantile beriberi, chronic or dry beriberi and the Wernicke-Korsakoff syndrome.
**Drug Treatment:**
Thiamine 5-25 mg, I.M, 12 hourly for three days followed by the same dose orally for four weeks.

**Advice:**
Get diet rich in thiamine such as fortified breads, unpolished cereals, pasta, wheat germ, fish, dried peas and soya beans

**20.1.5 Riboflavin Deficiency**
**Description/clinical features:**
The deficiency syndrome is characterized by sore throat, pharyngeal and oral mucous membrane hyperaemia, angular stomatitis, cheilosis, glossitis, and anaemia. Riboflavin deficiency almost invariably occurs in combination with other vitamin deficiencies.

**Drug Treatment:**
Vitamin B complex, oral, one tablet 8 hourly for 1 month.

**Advice:**
Get diet rich in riboflavin such as meat, dairy products, dark green vegetables especially broccoli, beans and peas

**20.1.6 Pyridoxine Deficiency**
**Description/clinical features:**
Pyridoxine deficiency is related to:
• Malnutrition
• Alcoholism
• Malignancy

Common manifestations include:
• Symptoms and signs of anaemia
• Signs of peripheral neuritis such as:
  • tingling sensation of the legs
  • leg pains
  • calf muscle cramps
  • muscle weakness

**Note:** Signs of peripheral neuritis may occur during TB treatment (isoniazid).
**Drug treatment**
Pyridoxine oral in the morning for 3 weeks:

**Deficiency**
- **children:** 25 mg
- **adults:** 25 mg

**Drug-induced neuropathy**
- **children:** 50–200 mg
- **adults:** 50–200 mg
- followed by prophylactic doses of 25–50 mg oral, in the morning

**Note:** For Isoniazid induced Pyridoxine deficiency replaces Isoniazid with Ethambutol.

**Advice:**
Get diet rich in pyridoxine such as chicken, eggs, fish, kidneys, liver, peas and wheat germ

**Referral Criteria:**
- Convulsions
- Hallucinations
- Anaemia
- Seborrhoeic dermatitis around the eyes, nose and mouth accompanied by stomatitis and glossitis

20.1.7 Ascorbic Acid Deficiency

**Description/clinical features:**
Scurvy is the primary deficiency disease. Clinical features of scurvy include follicular hyperkeratosis, swollen, purple and spongy gums which bleed easily. Haemorrhages may occur in other sites.

**Drug Treatment:**
Ascorbic Acid 100 mg, oral, 8 hourly for 14 days, then 100 mg orally for one month.
A diet rich in Vitamin C e.g. Oranges and other citrus fruits and vegetables should be recommended

20.1.8 Vitamin K Deficiency

**Description/clinical features:**
Vitamin K is essential for the synthesis in liver for prothrombin; factor VII, IX and X. Primary deficiency occurs only in neonates. Secondary
Vitamin K deficiency may be associated with malabsorption syndromes, liver cirrhosis and the use of Coumarin derivatives like Dicumarol, Warfarin and other analogues.

**Drug Treatment:**
Phytomenadione 10mg, I.V, stat (neonates 1 mg I.M)

**Advice**
Get diet rich in vitamin k such as green leafy vegetables and oils such as olive, cotton seeds and soya beans. Others include green peas, beans, spenarch, and broccoli.

20.2 **Malnutrition**

20.2.1 **Malnutrition, severe**

*Description/clinical features:*
A multideficiency state of severe undernutrition of protein, energy and various other minerals, micronutrients and vitamins that includes the clinical entities of Kwashiorkor, Marasmus and Marasmic-Kwashiorkor. It is associated with a high but significantly modifiable mortality.

**Kwashiorkor:** usually below the 3rd percentile of weight for age, peripheral oedema, skin changes, fine pale sparse hair, potential high mortality.

**Marasmus:** under 60% expected weight for age or less than 3 standard deviations (< 70% expected weight for height), visible severe muscles wasting, loss of muscle bulk and subcutaneous fat due to severe undernutrition in children.

**Marasmic-Kwashiorkor:** children with features of both Kwashiorkor and Marasmus.

**Danger Signs**
Any of these indicate need for intensive management:
- dehydration • hypoglycaemia
- shock • jaundice
- lethargy • refusing feeds
- weeping skin lesions • respiratory distress
- hypothermia • bleeding
### Time frame for management of child with severe malnutrition

<table>
<thead>
<tr>
<th></th>
<th>Stabilization</th>
<th>rehabilitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1-2</td>
<td>Day 3-7</td>
<td>Weeks 2-6</td>
</tr>
</tbody>
</table>

- Hypoglycemia
- Hypothermia
- Dehydration
- Electrolytes
- Infection
- Micronutrients
  - no iron
  - with iron
- Initiate feeding
- Catch up growing
- Sensory stimulation
- Prepare for follow up

**Stabilisation phase**
- feeding
- immediate: stabilisation phase
- begin feeding immediately – do not miss feeds
- use “start up formula” 130 mL/kg/day divide into 3 hourly feeds, i.e. 8 times daily
- “start up formula”:
<table>
<thead>
<tr>
<th></th>
<th>Formula A</th>
<th>Formula B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole drink milk</td>
<td>25 g</td>
<td>-</td>
</tr>
<tr>
<td>Fresh cows milk</td>
<td>-</td>
<td>300 ml</td>
</tr>
<tr>
<td>Sugar</td>
<td>100 g</td>
<td>100 g</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>20 g</td>
<td>20 ml</td>
</tr>
<tr>
<td>Trace element mix*</td>
<td>20 ml</td>
<td>20 ml</td>
</tr>
<tr>
<td>Water to make up to</td>
<td>1 000 ml</td>
<td>1 000 ml</td>
</tr>
</tbody>
</table>

100 ml contains:
- Energy: 75 kcal
- Protein: 0.9 g
- Sodium 0.6 mmol

* **Trace element mix**

<table>
<thead>
<tr>
<th>Trace element mix</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CuSO4 (0.5% solution)</td>
<td>10ml</td>
</tr>
<tr>
<td>ZnSO4</td>
<td>18g</td>
</tr>
<tr>
<td>MgSO4</td>
<td>140g</td>
</tr>
<tr>
<td>Aqua Chlorof conc</td>
<td>12.5ml</td>
</tr>
<tr>
<td>Water to</td>
<td>500ml</td>
</tr>
</tbody>
</table>

- if danger signs, hypothermia or hypoglycaemia present, feed the same daily volume but divided into 2 hourly feeds, i.e. 12 times daily
- if feeds refused/not finished feed via nasogastric tube
- Rehabilitation phase
- when appetite returns, usually within a week, change to “rebuilding formula” to increase the calories/protein content in the feeds introduce a balanced soft mixed high-energy diet and add oil or margarine or peanut butter to meals.
Prepare food without added salt.

- for first two days replace the initial feeds with equal amounts of “rebuilding formula”, then gradually increase the volume by 10 mL per feed until some formula remains unfinished, usually ± 200 mL/kg/day
- “Rebuilding formula”:

<table>
<thead>
<tr>
<th></th>
<th>Formula C</th>
<th>Formula D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole drink milk</td>
<td>80 g</td>
<td>-</td>
</tr>
<tr>
<td>Fresh cows milk</td>
<td>-</td>
<td>880 ml</td>
</tr>
<tr>
<td>Sugar</td>
<td>50 g</td>
<td>75 g</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>60 g</td>
<td>20 ml</td>
</tr>
<tr>
<td>Trace element mix</td>
<td>20 ml</td>
<td>20 ml</td>
</tr>
<tr>
<td>Water to make up to</td>
<td>1 000 ml</td>
<td>1 000 ml</td>
</tr>
</tbody>
</table>

100 ml contains:
  Energy: 100 kcal
  Protein: 2.9 g
  Sodium 1.9 mmol

- detect and treat hypoglycaemia
- test blood glucose level 3 hourly in severely ill child for 1st 24 hours and until stable
  - If blood glucose <3 mmol/L in asymptomatic child, give:
    - immediate feed of “start up formula”, or
    - Dextrose, 10%, IV, bolus, or
    - sugar solution, oral, 5 mL/kg
  - monitor blood glucose and maintain above 3 mmol/L. Continue feeds.
  - if symptomatic or unresponsive hypoglycaemia, give dextrose 10%, IV, 5 mL/kg
  Continue feeds.

**Note:** These children have poor cardiac reserves and are easily volume overloaded – do not maintain I.V infusions unless absolutely necessary
• Prevent and treat hypothermia
• Prevent hypothermia
• Use mother-child skin-skin contact, i.e. Kangaroo care, to keep child warm
• Keep child, especially the head, covered at all times especially at night. Protect the airway.
• Avoid drafts and change wet napkins regularly
• Avoid exposure e.g. bathing
• Care for child in a warm area, i.e. 25–30°C
• Feed immediately and 3 hourly as this provides energy to generate heat
• Treat hypothermia
• Check underarm temperature 3 hours post feed
• Axillary temperature < 36°C indicates urgent need to warm child
• Use mother-child skin-skin contact, i.e. Kangaroo care, to keep child warm and wrap both with blankets
• If no mother, clothe and wrap child, including the head with warmed blanket. Protect the airway.
• Place heater nearby
• If severely hypothermic and not improving use other heating measures but do not apply direct heat to the skin as they may burn the child, e.g. hot water bottles
• Check temperature 2 hourly until > 36.50°C using a low reading thermometer
• Consider infection and sepsis (see below)
• Exclude HIV and TB (consider empiric treatment)
• Ensure immunisation, especially measles
• Counsel parents or caregivers regarding regular and appropriate feeding
• Before discharge, ensure parent/caregiver is able to access food for the child, referral to a primary health care nutritional support centre, and all financial supports and grants have been accessed

**Drug Treatment:**

**Acute management**
Treat all admissions as infected as signs of infection are usually absent.
• Gentamicin, I.V, 6 mg/kg once daily for 7 days

**Plus**
• Ampicillin, I.V, 50 mg/kg/dose, 6 hourly for 2 days
Follow with
• Amoxicillin, oral, 30 mg/kg/dose, 8 hourly for 5 days
For gastrointestinal infection/infestation
• Metronidazole, oral, 7.5 mg/kg/dose, 8 hourly for 5–7 days

For dysentery
• Cefotaxime, I.V, 25–50 mg/kg/dose, 6–8 hourly

Or
Ceftriaxone, I.V, 50–75 mg/kg, once daily

Mineral and micronutrient deficiencies
Serum potassium does not indicate body potassium status. Formulae may have the potassium and trace elements included in the feeds.
• Potassium chloride solution, 25–50 mg/kg/dose, oral, three times daily until oedema subsides
  < 10 kg 250 mg
  > 10 kg 500 mg
• Magnesium sulphate 50%, oral, 0.2 mL/kg as a once daily dose for a week
• Vitamin A, oral, as a single dose
  Under 6 months: 50 000 IU
  6–12 months: 100 000 IU
  Above 12 months: 200 000 IU
• Folic acid, oral, 2.5 mg as a single daily dose
• Multivitamin, oral, 5 mls as a single daily dose

If child does not improve clinically in 48 hours
• refer

Non-acute management
Iron supplementation is only given once gaining weight and oedema has resolved.
• Iron, oral, 2 mg/kg elemental iron per dose 8 hourly with meals

For intestinal infestation
Children under 2 years:
• Albendazole 200 mg, oral, as a single dose immediately

Children 2–5 years:
• Mebendazole 100mg, oral, twice daily for three days

Children over 5 years:
• Mebendazole 500mg, oral, as a single dose immediately
**Prevention:**
- Breast feeding up to two years
- Introduction of weaning foods at 4 – 6 months
- Regular feeding with a balanced diet
- Child spacing.

**Advice:**
- All children with severe malnutrition should be admitted to Hospital

**Follow up:**
- Children who have suffered from Malnutrition should be weighed every two weeks at the MCH Clinic until they are in the green area of the road to Health card.
- Thereafter, it is important that they are weighed monthly for at least 6 months.
CHAPTER 21

21.0 SKIN DISEASE CONDITIONS

Description/clinical features:
Skin infection is an inflammation of the skin, usually caused by bacteria. Fungi, viruses and parasites may also cause skin infections. Bacterial skin infections can be impetigo, erysipelas or recurrent boils. All these are caused by either staphylococcus alone or together with streptococcus but rarely streptococcus alone.
Viral conditions: warts, herpes simplex, herpes zoster and varicella, kaposis varicelliform eruption
Fungal conditions: candidiasis, ringworm and tinea vesicolor
Parasite skin conditions: scabies and pediculosis

21.1 Bacterial Skin Infection

21.1.1 Impetigo

Description/clinical features:
A superficial bacterial infection causing rapidly spreading blisters which easily break down to form a crust. It occurs commonly in children, usually starting on the face, especially around the mouth or nose. Often due to Staphylococcus aureus.

Non Drug Treatment:
Keep infected areas clean and prevent spread to others (care with towels, clothes, bedding; change frequently)

Drug Treatment:
Bath affected parts/soak off the crusts with:
Potassium permanganate, Cetrimide, Chlorohexidine or Pant with Gention Violate
Or
Simply with soap and water.
If severe, or systemic symptoms are present (e.g. Pyrexia) add an oral antibiotic.
Systemic
First Choice:
Adults: Cloxacillin 500mg, oral, 6 hourly for 10 days
Children: Cloxacillin, oral, 50-100 mg/kg/day in four divided doses for 10 days.

Second choice:
Adult: Erythromycin 500mg, oral, 8 hourly
Children: Erythromycin, oral, 50mg/kg, 8 hourly for 10 days

Advice:
Cut nails to prevent scratching and spreading the lesion

Prevention:
• Wash hands and body regularly
• Prevent contact with infected people

21.1.2 Folliculitis
Description/clinical features:
Superficial infection causing small pustules each localized around a hair follicle. Deep follicular inflammation often occurs in the bearded areas of the face (Sycosis barbae).

Non Drug Treatment:
Suspected irritants should be avoided
Use of suitable disinfecting and cleansing agents should be encouraged (Potassium permanganate or Cetrimide or chlorohexidine)

Drug treatment:
If the boil causes swollen lymphnode and fever consider systemic antibiotic as above.

21.1.3 Boil/Absces
Description/clinical features:
Boil/Absces most frequently caused by Staphylococcus aureus. The skin around becomes red and hot.
Usually resolves itself, but improved by placing frequent hot compresses over the boil until it breaks.
In a healthy person, review after 2 days, if not improving consider surgical incision and drainage.
**Note:**
If the boil/Abscess causes swollen lymph nodes and fever, consider systemic antibiotics

**Non Drug Treatment:**
- Encourage general hygiene
- Apply local hot compresses three times daily until the boils / abscess starts draining
- Drainage of abscess is treatment of choice surgical incision being performed only after the lesion is mature.

**Drug Treatment:**
Antibiotic therapy
Is only indicated if there are systemic features of infection on marked surrounding cellulites

**First Choice:**
Cloxacillin, oral, for 7 days
**Adult:** 500mg, 6 hourly
**Children:** 50 mg / kg, 6 hourly

**Second Choice:**
Erythromycin oral, for 7 days
**Adult:** 500mg, 6 hourly
**Children:** 50 mg / kg, 6 hourly

21.1.4. Erysipelas

**Description/clinical features:**
A superficial cellulitis with lymphatic vessel involvement, due to streptococcal infection.
Usualy you don't see the portal entry. The area affected has a growing redness, well demacated and accompanied by high fever and pains. Responds to oral Penicillin.

**Drug treatment:**
**First choice** Phenoxyemethylpenicillin, oral, for 5-7 days
**Adults:** 250 – 500mg, 6 hourly
**Children:** 25mg/kg, 6 hourly
Note:
• Starting with benzylpenicillin injection offers no advantage
• Erysipelas has tendency to recur in the same area, especially if there are predisposing factors such as chronic lymphatic oedema
• In recurrent episodes, increase duration of antibiotic to 10-14 days
• Bed rest, elevate the affected part and potassium permanganate or topical 2% Mupirocin ointment compresses may be beneficial

21.1.5 Acute Cellulitis

Description/clinical features:
Cellulitis is an acute, spreading pyogenic inflammation of the dermis and subcutaneous tissue commonly caused by streptococci or Staphylococci, usually complicating a wound, ulcer, or dermatosis. The area, usually on the leg, is tender, warm, erythematous, and swollen.

Acute cellulitis should be differentiated from erysipelas as follows:
• Raised, sharply demarcated margins from uninvolved skin erysipelas;
• Indistinct borders – acute cellulitis

Acute cellulitis can be serious if not treated early (spreads through lymphatics and bloodstream).

Drug Treatment:
First Choice
Cloxacillin, oral, for 5-7 days
Adults: 500mg, 6 hourly
Children: 50 - 100mg/kg, 6 hourly

Second Choice
Erythromycin, oral, for 5-7 days
Adults: 500mg, 6 hourly
Children: 25 - 50mg/kg, 6 hourly

21.1.6 Acne

Description/clinical features:
An inflammatory condition of the hair follicle. Blockage of the follicle leads to comedone formation:
• Open comedones-black heads
• Closed comedones-white heads
Secondary changes lead to scarring and inflammation

• Pustules – Raised skin lesion less than a centimetre with fluid collection
• Papules - Raised skin lesion less than a centimetre without fluid collection
• Nodules - Raised skin lesion more than a centimetre without fluid collection
• Cysts - Raised skin lesion more than a centimetre with fluid collection
• Sinuses

All forms of acne can cause scars
Post inflammatory hyperpigmentation may be disfiguring, especially in pigmented skin.
This will gradually fade once the acne is controlled.
Response to treatment may be slow and treatment may need to be continued for months to years.

**Non drug treatment**

• Seek underlying cause e.g. over use of oils on skin, stress, anticonvulsant drugs etc.
• Encourage a healthy lifestyle – exercise, sunshine, diet, etc
• Use ordinary soap and water 2-3 times a day (harsh antibacterial cleansers or iodine-containing preparations may aggravate the acne)

**Drug Treatment:**

5% Benzoyl peroxide gel, topically at night (to avoid photosensitivity)
In severe cases of nodular acne, treat with oral antibiotics
Doxycycline 100 mg, oral, twice daily in two weeks interval. Continue until condition has improved; this may take 2-4 months.

Or
Low dose of Erythromycin 250mg, 12 hourly for the duration of one month
The patient should be properly counselled.

**Note:**
The acne may initially worsen, if too irritant, use every second or third night.
Patients should be encouraged to persist with treatment.
Advice:
• Frequent wash of face with soap
• Avoid squeezing and pricking of acne.
• Avoid application of heavy oil on the face i.e Vaseline, and powder.

21.1.7 Paronychia
Description/clinical features:
Painful red swellings of the nail folds which may be due to bacteria or yeast.
Paronychia can be:
• Chronic – Obvious swelling which persist all the time but not painful
• Acute on chronic – Is the chronic but become painful

Drug Treatment:
First choice:
Cloxacillin, oral, for 5-7 days
Adults: 250 – 500mg, 6 hourly
Children: 25 - 50mg/kg, 6 hourly

Second choice:
Erythromycin, oral, for 5-7 days
Adults: 500mg, 6 hourly
Children: 25 - 50mg/kg, 6 hourly

Chronic Paronychia
Often fungal, due to candida. Avoid excessive contact with water, protect from trauma and apply:
Clotrimazole Solution, apply three times a daily
Treat secondary infection with antibiotics as above

Note:
For both acute and chronic paronychia, incision and drainage may be needed

21.2 Skin Fungal Infection
Description/clinical features:
The skin may be infected by yeast or fungi and the clinical presentation varies with organism, body site infected and the body’s response to the infection.
21.2.1 Dermatophytosis (Ringworm)

**Description/clinical features:**
It is a chronic fungal infection of the skin, hair or nails. Clinical features depend on site of infection and species of infecting fungus. The types of fungus and site are shown below. Ringworm on hairs is shown by loss of hair, itching and and some time pustules formation. On the skin there is a colour change.

21.2.1.1 Tinea Corporis (Body Ringworm)

**Description/clinical features:**
Round, expanding lesions with white, dust-like scales and distinct borders on the body or face.
Responds to any of the topical antifungal agents

**Drug Treatment:**

**First choice:**
Compound Benzoic acid (Whitfield ointment) applied two to three times a day for up to 4 weeks.

**Second choice:**
1% Clotrimazole cream, apply thinly three times a day, continue for 5 to 7 days after clearing of symptoms.

**Or**
2% Miconazole cream, apply thinly two to three time a day. Continue for 5-7 days after clearing of symptoms

**Plus**
Griseofulvin, oral, for 8-12 weeks

**Adults:** 500mg, daily,
**Children:** 10-50 mg/kg

**Prevention:**
Avoid contanct or playing with domestic pets like cats

21.2.1.2 Tinea Capitis (Scalp Ringworm)

**Description/clinical features:**
This is a fungal infection whereby, the fungus has grown down into the hair follicle. Topical treatment is unlikely to be effective.

**Drug treatment:**
Griseofulvin, oral, for 8-12 weeks

**Adults:** 500mg once daily
**Children:** 10mg/kg once daily
21.2.2 Tinea Vesicolor (Pityriasis Versicolor)

**Description/clinical features:**
For common fungal infection caused by a yeast. hypopigmented patches of varying size on the chest, back arms and occasionally neck and face.

**Drug Treatment:**
Apply Miconazole or Ketoconazole cream/ointment
If the condition persists or involved on a large area, then systemic treatment is recommended
Ketoconazole 200mg, oral, once a day for 5-10 days.

Treat as Tinea corporis for a longer period
Continue with treatment 2 weeks after the symptom has disappeared.

**Caution:** The drug is hepatotoxic it has to avoided in case of Liver disease, pregnancy and the patient has to be advised to take heavy meals with fat and to return to hospital after 10 days for observation.

21.2.3 Tinea Pedis (Athlete’s Foot)

**Description/clinical features:**
This is a very common fungal infection and is often the source of infection at other sites.

**Drug treatment:**
Treat any bacterial super infection first:
**First choice:**
Whitefield lotion apply for 4 weeks

**Second choice:**
2% Miconazole cream or 1% Tolnaftate solution
Or
1% Clotrimazole cream / powder for 4 weeks

**Note:**
If the above medication not responding use Griseofulvin as above.
Advice:
Frequent change of socks/footwear, use of cotton socks, thorough
drying between toes after bathing, separating the opposing skin
surfaces (e.g. with a piece of gauze), will prevent infection and speed
up healing.

21.2.4 Candidiasis
Description/clinical features:
It is caused mainly by candida albicans. Clinical feature depend on the
site of infection. Thus the infection of the skin (cutaneous candidiasis) is
characterized by red, itchy lesions often found in the folds and on the
buttocks of babies. Infection of the nails gives a swollen and painful
nail bed which may discharge pus and is made worse by contact with
water. There may be destruction of the nail. Vulvae-vaginal Candidiasis
is common in women on the pill, in pregnancy and diabetics and in
people on prolonged antibiotic courses. Vulvae vaginal candidiasis
is characterized by pruritic, curd-like vaginal discharge, dysuria and
dyspareunia. Disseminated Candidiasis, a complication of the above,
presents with fever and toxicity.

Drug Treatment:

(a) Oral Oesophageal fungal infections
Nystatin 100,000 IU, for 14 days
Adults: apply as a gargle, 8 hourly
Children: oral suspension, 8 hourly
Or
Miconazole oral gel apply as oral suspension in children, 8 hourly
for 5 days
Or
Fluconazole 50mg, oral, daily for 7 – 14 days

(b) Vaginal infections
Nystatin Pessaries insert 1 tablet at night for 14 days
Or
Clotrimazole pessaries/vaginal cream insert 1 tablet or apply at night
for 6 days
Or
Miconazole Pessaries/vaginal cream insert/apply once at night for 3
days
Or
Ketoconazole 200 mg, oral, once a day for 10 days
Or
Fluconazole 150 - 200mg, oral, start may be repeated after 3 days

21.2.5 Deep fungal infection

Description/clinical features:
The common clinical entities of deep fungal infections are Nocardiosis and Actinomycosis.

Actinomycosis is caused by actinomyces. Its clinical features depend on the infected site. There is induration in the skin, sinus formation, pain and when lungs are involved there is a cough with purulent sputum.

Nocardiasis is an acute or subacute or chronic infection by nocardia species whose clinical features are mainly in the lungs and may include pneumonia, fever and a productive cough.

Drug Treatment:

General:
Doxycycline 100mg, oral, 12 hourly for 2-4 months for Actinomycosis.

Caution:
Doxycycline should not be given to pregnant women and children under 12 years of Age

Specific:

ACTINOMYCOSIS
Adults: Phenoxyemethylpenicillin 500mg, oral, 6 hourly for 2-4 months
Co-trimoxazole 480mg, 12 hourly for 2-4 months for Nocardiosis
Children: Phenoxyemethylpenicillin, oral 25 mg/kg, 6 hourly for 2-4 months
Co-trimaxazole, oral syrup 0.5 ml/kg, 12 hourly for 2-4 months
**Note:**
Regular blood examination must be done when Co-trimoxazole is used for more than 14 days

**NOCARDIASIS**

**Adult:** Dapsone 100mg, oral, every 24 hours for 2-4 months  
**Children:** Dapsone 25 – 50 mg, oral, every 24 hours for 2-4 months  
Co-trimoxazole 960mg (I.V) every 12 hours

**21.2.6 Scabies**

**Description/clinical features:**
It is caused by the mite Sarcoptes scabie burrowing into the skin. The main clinical features are buros and severe itching initially between the fingers web or on the buttocks or genitals and latter can be generalized. Family history of similar problem can help to reach the diagnosis.  
Complication: Secondary Bacteria infection eg. Streptococcal infection leading to pastular formation and ulceraton. If measures were not taken timely, this will further complicate to rheumatic fever and glomerulonephritis following the toxin which are secreted by the bacteria..

**Drug treatment:**
- Treat all close contacts, especially children in the same household with BBE. (. treat the whole family)  
  **Children:** BBE 25% diluted into half strength (part 1 water + 1 part BBE),  
  **Adult:** BBE 25%, both once a day, at night for seven day, do not apply to the face and the head.

Wash clothing and bedding and leave in the sun to dry
- Secondary bacterial infection (septic sores) treats with antibiotic as for impetigo for 5 days.
- The scabicide agent should only be applied once lesions are closed  
- Advice that the itch may continue for several weeks

**Prevention:**
- Good personal hygiene  
- Frequent washing of clothes and bed sheets  
- Put mattresses and sleeping mats in the sun regularly
Advice:
- All family members should be treated
- Cut the nails to prevent scratching
- During the treatment wash or boil all the clothes to prevent recurrence.

21.3 Skin Virus Infection

21.3.1 Herpes Simplex

Description/clinical features:
It is an acute infection characterized by superficial vesicles containing clear fluid in the skin and mucous membranes, particularly of the buccal area, on the conjunctive, corneas or genitalia. It is caused by the medium sized Herpes virus homines. The main clinical features are: tingling discomfort or itching, followed by vesicular formation. Outbreaks of herpes simplex virus encephalitis have been reported.

Drug Treatment:
0.5% Gentian Violate, apply to the affected area two to three times a day for 5-7 days.
Or
Acyclovir cream, apply 6 to 8hourly
And
Acyclovir 400mg, oral, 8 hourly for 7 – 10 days
And
Vitamin C 100mg, oral, 8 hourly for 2weeks
Or
Multivitamin, oral, 1 tablet twice a day for 2weeks

Note:
Use of systemic Acyclovir is effective when given at the onset of episode.

21.3.2 Herpes Zoster (Shingles)

Description/clinical features:
Due to the resurgence of the varicella-zoster virus, this also causes chickenpox.
Severe burning pain precedes a rash which is vesicular and almost always unilateral; does not cross the midline. In uncomplicated cases, the rash disappears in 24 weeks, in the haemorrhagic; necrotising form (HIV related) scarring often remains.
Drug Treatment:
• Pain Management: Indomethacin 25mg, oral, 8 hourly
• Apply topical calamine lotion or emollient or Gentian Violet or Acyclovir cream
• Take Acyclovir 800mg, oral, 6 hourly until no new lesions appear
• Cloxacilline 500mg, oral, 8 hourly
Or
Erythromycin 500mg, oral, 8 hourly for 7 days
• Wound care: Potassium Permanganate soak (1:4000).

Caution:
Avoid 0.5% Gentian Violet as repeated use in this condition may cause keloid
Secondary infection (bacterial) may require treatment.

Post-Herpetic Neuralgia
After the rash is fully resolved:
Amitriptyline 75 mg, oral, at night, may be increased to 150 mg at night
Or
Carbamazepine 200 mg, oral, at night; may be gradually increased to a maximum of 400 mg three times a day over 10 days
Indomethacin 25mg, 8 hourly

Referral criteria:
Refer if there is no improvement in sever neuralgia. Refer immediately if there is Ophthalmic/pulmonary involvement.

21.3.3 Chicken Pox (Varicella)
Description/clinical features:
A highly contagious infections disease due to herpesvirus, varicella-zoster virus, usually affecting children, spread by direct contact or the respiratory route via droplet nuclei, and characterized by the appearance on the skin and mucous membranes of the successive crops of typical pruritic vesicular lesions that are easily broken and become scabbed and generally accompanied by mild constitutional symptoms. It is relatively benign in children except in those with severe underlying disease, but adult infection may be complicated by pneumonia and encephalitis.
Clinical presentation
It is mainly fever followed by a papula eruption. It is self limiting.

Drug Treatment:
Adult: Paracetamol 1g, 4-6 hourly
And
Calamine lotion apply over the whole body every 24 hours
Children: Paracetamol 10 mg/kg, 6 hourly
And
Calamine lotion, as for adult

Note: If itching passists, use antihistamine

OTHER SKIN DISEASES

21.4 Allergic Contact Dermatitis
Description/clinical features:
Results from an acquired allergy after skin contact with particular chemicals (dyes, perfumes, rubber, nickel or drugs and skin preparations containing Lanolin, Iodine, Antihistamines, Neomycin, Vioform etc). Avoid contact if allergic.

Note: Avoid contact with allergen.( substance cousing allergy)

21.4.1 Eczema
Description/clinical features:
A pruritis papularvesicular dermatitis occurring to many endogenous exogenous agents, charcterized in the acute stage by erythema, oedema associated with serous exudates between the cells of the epidermis (spongiosis) and an inflammatory infiltrate in the dermis, oozing and vesiculation and an crusting and scaling, and in the more chronic stage by lichenificationor thickening or both, signs of excoriation and hyper pigmentation or hypo pigmentation or both.

Atopic Dermatitis (also called Eczematous Dermatitis):
It is the most common type of dermatitis; Often a personal or family’s history of atopic diseases e.g. asthma or hay fever, The Cause is not known. These persons are also more susceptible to herpes simplex and vaccinia (but not varicella-zoster).
The clinical form may differ according to age

(a) Infantile aczema (“milk crust”) usually appears at 3 months with oozing and crusting affecting the cheeks, forehead and scalp.

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<tr>
<th>Note:</th>
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<tr>
<td>If generalized exfoliative dermatitis develops, refer to a specialist</td>
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(b) Flexural eczema starts at 3-4 years, affecting the flexure surface of elbows, knees and nape of neck (thickening and lichenification). In adults any part or the whole of the skin may be affected with intense itching, particularly at night. Over a period of a month, there may be acute exacerbations and a chronic phase.

Non drug treatment:
Remove any obvious cause e.g. skin irritant or allergen (avoid irritants e.g. soap, wool and extremes of temperature).

Drug treatment:
Treat any infection (usually bacterial, but occasionally viral). Choice of skin preparations depends on whether lesions are wet (exudative) or dry/lichenified (thickened skin with marked skin lines).
If eczema is “weepy”, dry first using saline baths or bathe in: Potassium permanganate 1:4000 (0.025%) solution once daily for 2-4 days.
Where large areas are involved give a course of antibiotics for 5-10 days (as for impetigo, item no. 21.1.1)

After the lesions have dried, apply an aqueous cream or zinc oxide preparation for soothing effect. A topical corticosteroid may be useful in the acute phase. Use the mildest topical corticosteroid which is effective, starting with:

Hydrocortisone 1% cream for wet, ointment for dry skin. Apply thinly, frequently initially, then three times a day intermittently to prevent tachyfylaxia
**Note:**
Topical corticosteroids often do more harm than good. They may produce striae, acne lesions and hyper pigmentation. Avoid long term use; never use on weepy or infected skin. Advise patients **NOT** to use them as cosmetics

**Caution:**
Never use CORTICOSTEROID preparations on the **face or in children** unless supervised by a specialist. More potent steroid, e.g. betamethasone should only be prescribed by specialist

If the skin starts scaling (condition becomes chronic), add/apply a keratolytic preparation such as:

- 6% Benzoic acid +3% Salicylic acid (Whitfield) ointment applied twice daily.

For maintenance, an antipruritic preparation may be useful:

- 5% Coal tar ointment applied twice daily.
- 2% Salicylic acid and 5% Coal tar ointment are to be prepared extemporaneously.

Treat itching with an oral antihistamine such as Chlorpheniramine 4 -16mg, oral, at night.

**Caution:** Not recommended in children under 2 years.

**Or**
Cetrizine 10mg once daily for 3 to 5 days

**Note:** Avoid Alcohol, Never use topical antihistamines

### 21.4.2 Urticaria

**Description/clinical features:**
May be allergic, toxic or physical in origin. In many cases the cause is unknown (idiopathic). Allergic urticaria may be caused by drug (e.g. penicillin), infection, contact with plants, pollen, insect bites, or foodstuffs (e.g. fish, eggs, citrus fruits, nuts, strawberries, tomatoes). Physical urticaria may be caused by mechanical irritation, cold heat, sweating.

If acute (existing for less than 3 months), exclude drug reaction (e.g. penicillin), or infection (bacterial, viral or fungal).
Give antihistamine by mouth:

**Adult:** Chlorpheniramine 4-16 mg, oral, once at night.

**Caution:** Not recommended in children under 2 years.

**Or**
Cetrizine 10mg, oral, once daily for two weeks

**Or**
Predinisolone 15mg, oral, daily for two week, reduce dose to 10mg daily for one week, 5mg daily for one week.

**Note:**
Warn about drowsiness. If no improvement after 1 month or chronic problem, refer.
Never use topical antihistamines.

### 21.4.3 Psoriasis

**Description/clinical features:**
A condition of the skin characterized by thickening and scaling (the disposition is inherited) usually symmetrical.
Exclude precipitating factors e.g. alcohol, deficiencies of vitamin B12 or folate, stress and infections.
To reduce scaling use a keratolytic.

**Drug treatment:**
6% Benzoic acid + 3% Salicylic acid in white soft paraffin applied once daily in the evening.
Sun exposure to the lesions for half an hour or one hour daily may be of benefit. In resistant cases

**Plus**
5% Coal tar in 2% Salicylic acid

**Or**
Zinc oxide ointment +5%Coal tar

**Note:**
Steroids are discouraged in this condition. If not responding well, refer.

**Second Choice:** Corticosteroids, topical
CHAPTER 22

22.0 SOME OTHER INFECTIOUS CONDITIONS

22.1 Anthrax

Description/clinical features:
Anthrax is a disease of animals. However, man is infected directly through contact with infected hides or inhalation of spores in the lungs or ingestion of infected meat. Hence it can be cutaneous, pulmonary and/or intestinal. The main clinical features are itching, a malignant pustule, pyrexia and rarely pulmonary and gastrointestinal signs.

Drug Treatment:

Medicine of choice Benzylpenicillin

Adult: 0.6 MU, I.V, every 6 hours until local oedema subsides then
Continue with Phenoxyymethylpenicillin, oral, 250mg, 6 hourly for 7 days.

Children: Premature infant and neonate 6mg/kg body weight
every 6 hours until local oedema subsides then continue with
Phenoxyymethylpenicillin, oral, 62.5mg, 6 hourly for 7 days.

Infants, 1-12 months: 75 mg/kg, 8 hourly until local oedema
Subsides;
Then continue with Phenoxyymethylpenicillin 62.5mg, 6 hourly for 7
days

Infants, 1-12 years: 100 mg/kg body weight daily 6 hourly until 1
local oedema subsides

Then give
Phenoxyymethylpencilllin as follows:

For child 1-5 years: 125mg, 6 hourly for 7 days
For child 6-12 years: 250mg, 6 hourly for 7 days
Second choice:
**Adult:** Erythromycin 500mg, oral, 8 hourly for 10 days
**Children:** Erythromycin, oral, 10 mg/kg, 8 hourly for 10 days

### 22.2 Mastitis (Breast Abscess)

**Description/clinical features:**
Mastitis is an inflammation of the breast. The common causative organisms of the diseases are either staphylococcus or streptococcal bacteria. The breast becomes red, swollen and painful. In breast abscess, there is a collection of pus in the breast. Clinical features of a breast abscess are tenderness, swelling, red, warm, fever and painful lymph nodes.

**General:** In mastitis stage the treatment is antibiotics and antiflogistics. In abscess stage treatment is both surgical and antibiotics.

**DrugTreatment:**
Cloxacillin 500mg, oral, 6 hourly for 7 days.

**Or**
Erythromycin, oral, 500mg on the first day then 100mg daily for further 6 days

**And**
Acetylsalicylic acid 600mg, oral, 6 hourly. Instruct the patient to apply hot compresses and a constriction bandage to relieve pain in the affected breast, and to express milk if applicable to reduce engorgement.
CHAPTER 23

23.0 POISONING

Description/clinical features
Poisoning can be accidental or intentional and may be due to various substances.
Clinical features: For the majority of poisons, the clinical features are non-specific and may include:
Coma, convulsions, acute confusion, hepatic and/or renal failure, skin eruption, psychiatric or neurologic disturbance of acute onset. Relevant history should be elicited from patient, relatives or friends.

EXPOSURE TO POISONOUS SUBSTANCES
GENERAL MEASURES:
• Limit further exposure to toxin

In case of skin exposure, wash exposed body parts and remove clothes. Showering may be useful. Eye contaminants, especially alkalis, acids and other irritants, should be removed by continuous irrigation of the eye for 15 – 20 minutes
• Maintain and follow basic clinical parameters , i.e.:

- Maintain adequate respiration (oxygenation) and circulation
- Blood pressure
- Hydration
- Ventilation
- Gastric wash out with 0.9% Sodium chloride if poison ingested within 3-4 hrs.
- Control seizures and prevent physical injury in the restless. Avoid excess sedation
- Induce emesis with appropriate available medicine(s) e.g. with syrup Ipecacuanha 15-20ml, followed by 200ml-300ml of water or milk
- Use activated Charcoal when appropriate
- Use laxatives when appropriate
- Provide good nursing care + monitoring of all vital signs

INITIATION OF TREATMENT

Neutralise poison

Administer only if a patient has ingested a potentially toxic amount of a poison which is known to be adsorbed by Charcoal
Administer within 1-2 hours after ingested of poison.
- Charcoal, activated, oral, 50-100g diluted in 300-600ml of water.

In poisoning with large amounts, repeat at least 12.5mg hrly.

Note: When mixing, add Charcoal to water, and not vice versa.

For Children 6-12 years: 25gm activated charcoal suspended in clean water.

For Children 0-5 years: 12.5gm activated charcoal suspended in clean water

Alkalisation

Possible benefit in salicylate:

Note:
Salicylate poisoning may cause a respiratory alkalosis, which may aggravate the metabolic acidotic state. The infusion of large volumes sodium and water may precipitate hypernatraemia and fluid overload. The increase in pH may also be associated with hypokalemia, which may cause dysrhythmias in a patient with a tricyclic antidepressant overdose.
Haemodialysis

PATIENT SHOULD BE REFERRED TO A TERTIARY (DIALYSIS) CENTRE

Referral criteria:

- Severely ill patient for ventilator/circulatory support
- Relevant diagnostic testing not available, e.g. paracetamol levels
- Relevant medication/antidotes is not available
- Where dialysis/haemoperfusion is required
- For psychiatric evaluation

SPECIFIC POISONING

23.1 Opioid Poisoning

Description/clinical features:

Heroines and cocaines are common drug of abuse. They may be absorbed through any mucous membrane, smoked or injected intravenously.

Patient may present with one or more of the following:

- Acute myocardial infarction
- Seizures
- Drowsiness which may progress to coma,
- Tachycardia and hypertension
- Stroke
- Pulmonary oedema
- Alteration in mood and confusion

Non drug treatment:

Supportive management aimed at preventing and managing complications

Cool patients with hyperthermia.

Aspiration of vomit is a special hazard and hypoglycaemia may occur in children and some adults.

Measure blood glucose and give glucose if indicated.
**Drug treatment:**

- Diazepam 10mg I.V – for control of seizures whenever necessary.
- The specific antidote Naloxone is indicated if there is coma or bradypnoea.

**Adult:** Naloxone 0.8-2mg, I.V, repeated at intervals of 2-3 minutes until reversal or pupils dilate. Total effective dose is 10 mg.
**Child:** 10mcg/kg.

*Note:* Since Naloxone has a shorter duration of action, repeated injections are necessary.

### 23.2 Alcohol Poisoning

**Description/clinical features:**
Acute poisoning with alcohol (Ethanol) is common in adults but also occurs in children. The features include:

- Central nervous system depression
- Hypoglycemia
- Hypothermia
- Change in fluid and electrolyte status

**Drug Treatment:**

Supportive management aimed maintaining stable cardiorespiratory function.

Manage hypothermia.

Thiamine 100mg I.V in 1 litre 5% Dextrose

### 23.3 Hydrocarbons Poisoning

**Description/clinical features:**
Poisoning due to petroleum products, most common in Zanzibar is kerosene poisoning.

Common clinical signs may include:

- Aspiration pneumonia
- GIT effects
- Arrhythmias
- CNS effects
Non drug treatment:
If contaminated, remove clothing and wash skin.

Drug treatment:
Antibiotic in case of pneumonitis: -Penicillin injection

If severe pneumonitis, Give benzylpenicillin + chloramphenicol injection Oxygen therapy,

Mechanical ventilation (in case of respiratory failure) = \( \text{PaO}_2 < 60\text{mmHg} \), and \( \text{PaO}_2 > 50\text{mmHg} \)

Caution: Do not attempt gastric emptying/lavage because kerosene is a volatile liquid which may quickly penetrate into the lungs and causes chemical pneumonia (pneumonitis)

Remember:
15 – 30 ml ingestion of kerosene = Fatal

The following substances are NOT adsorbed by activated charcoal:

- All alcohols
- Hydrocarbons
- Metals e.g. lead
- Minerals e.g sodium

Dose of Activated charcoal:
Under 6 years: 10g in 50 – 100ml water

Above 6 years: 20 – 50g in 100 – 300 ml water

Placement of nasogastric tube may be necessary for its prompt administration.

23.4 Paracetamol Poisoning

Description/clinical features:

The liver is the main organ acutely damaged in paracetamol poisoning. Acute ingestion of doses of 7.5-15g in a healthy adult may cause severe centrilobular hepatic necrosis. In patients on enzyme inducers, particularly Alcohol, lower dose of paracetamol causes damage. Renal tubular necrosis may also develop.
**Drug treatment:**

Acetylcysteine is the antidote of choice and should be given I.V. Although it is more effective when given within 8 hours of ingestion of paracetamol, there may be benefit even if liver failure has developed.

It is never too late to administer acetylcysteine.

**Dose:** by I.V infusion, in 5% Glucose, initially 150mg/kg in 200ml over 15 minutes, followed by 50mg/kg in 500ml over 4 hours, then 100mg/kg in 1000ml over 16 hours.

---

### 23.5 Salicylates and other NSAID Poisoning

**Description/clinical features:**

Poisoning due to overdose of Salicylates and other NSAID Poisoning

Patients present with:

- nausea
- vomiting
- CNS depression
- respiratory alkalosis followed by metabolic acidosis or one or both disorders
- tinnitus
- convulsions
- non cardiogenic pulmonary oedema

**Drug Treatment:**

Alkalisation (8.4% Sodium bicarbonate Injection) often with potassium replacement

Dosage of Sodium bicarbonate injection is determined by the severity of the acidosis, appropriate laboratory determinations, and the patient’s age, weight and clinical condition. Sodium bicarbonate injection is administered by the intravenous route preferably via a central line. Extravasation must be avoided; the solution is hypertonic and irritant to veins resulting in extensive skin necrosis if the solution leaks from the vein in the tissues. I.M injection is not recommended

In cardiac arrest, an initial direct intravenous dose of 1 mmol/kg (1 ml/kg of an 8.4% sodium bicarbonate solution) may be given, followed
by 0.5 mmol/kg (0.5 ml/kg of an 8.4% sodium bicarbonate solution) at ten minute intervals depending on arterial blood gases and according to the appropriate treatment protocol and guidelines.

Adequate alveolar ventilation should be ensured during cardiac arrest and administration of sodium bicarbonate, since adequate ventilation contributes to the correction of acidosis and since administration of sodium bicarbonate is followed by release of carbon dioxide.

**Children:** The usual dose is 1 mmol/kg (1mL/kg of an 8.4% sodium bicarbonate injection) given by slow intravenous injection.

**Infants up to 2 years of age:** The solution should be diluted with an equal amount (1:1 ratio) of 5% glucose or water for injections (to make 4.2% sodium bicarbonate solution) for slow intravenous administration and at a dose not to exceed 8mmol/kg/day, and according to the appropriate treatment protocol and guidelines. This diluted solution is hypertonic. Slow administration rates and a 4.2% solution are recommended in neonates to minimise the possibility of producing hypernatraemia, decreasing cerebrospinal fluid pressure and inducing intracranial haemorrhage.

**Note:** Where acidosis does not respond rapidly to sodium bicarbonate, consider haemodialysis.

**Advice:**

Consider ICU admission for pulmonary and/or cerebral oedema.

### 23.6 Anticoagulant Poisoning

**Description/clinical features:** Poisoning due to warfarin ingestion.

**Drug treatment:**

Vitamin $K_1$ 10mg, I.V./I.M,

May be repeated depending on the INR response.

Patients bleeding require additional fresh frozen plasma and the first dose of I.V Vitamin K.

Follow up doses by any route may be required if INR continues to rise, as Vit K has a shorter half-life than warfarin.
23.7 Herbal Medicine Poisoning

**Management:**

Gastric lavage (abdominal wash)

**Or**

- Induce emesis with appropriate available medicine(s) e.g with syrup Ipecacuanha 15-20ml, followed by 200ml-300ml of water or milk
  
  Monitor kidney function and hydration status

23.8 Iron Toxicity

**Description/clinical features:**

Iron is a commonly prescribed drug, especially in pregnancy, and causes initial gastrointestinal toxicity.

More significant exposure may be associated with:

- metabolic acidosis
- hypotension
- CNS side effects
- renal failure
- hepatitis

**Drug treatment:**

**Chelation therapy**

Patients with serum iron levels < 54 micromol/L and absence of symptoms more than 6 hours after overdose do not require chelation therapy.

- Desferrioxamine 1–2 g, I.V, 3–12 hourly to a maximum of 6 g every 24 hours

For levels > 180 micromol/l, consider exchange transfusion.

If serum iron levels are not available and the probability of this poisoning is high administer a single dose of desferrioxamine 1 g and observe for “vin rosé” discoloration of urine, which indicates high blood iron levels. If present, continue with chelation therapy, as above.

Give intravenous fluids for hypotension.
### ANNEX 1: LIST OF LABORATORY NORMAL VALUES

<table>
<thead>
<tr>
<th>S/NO</th>
<th>TEST</th>
<th>AGE</th>
<th>SPECIMEN</th>
<th>NORMAL RANGE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Haemoglobin</td>
<td>Infant</td>
<td>Blood</td>
<td>13.6-19.6, 11.2-18.0, 10.2-12.9, 13.5-18.0, 11.5-16.4</td>
<td>g/dl</td>
</tr>
<tr>
<td></td>
<td>Calorimetric</td>
<td>Children &lt;1 year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adult Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adult Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Taliquist</td>
<td>Children &lt;5 years</td>
<td></td>
<td>80.5-94.5, 94.5-122.5, 87.5-112</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adult Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adult Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Albumin</td>
<td>Blood</td>
<td></td>
<td>3.5-5.0</td>
<td>g/dl</td>
</tr>
<tr>
<td>3.</td>
<td>Bilirubin</td>
<td>Neonate</td>
<td>Blood</td>
<td>up to 18, up to 22, up to 5</td>
<td>µmol/l</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Adult</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conjugated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Bleeding time</td>
<td>Blood</td>
<td></td>
<td>2-7</td>
<td>min</td>
</tr>
<tr>
<td>5.</td>
<td>Clotting time</td>
<td>Blood</td>
<td></td>
<td>1.5-4</td>
<td>min</td>
</tr>
<tr>
<td>6.</td>
<td>Cholesterol</td>
<td>Blood</td>
<td></td>
<td>up to 5.2</td>
<td>mmol/l</td>
</tr>
<tr>
<td>7.</td>
<td>Creatinine</td>
<td>Male</td>
<td>Blood</td>
<td>80-118, 55-98</td>
<td>µmol/l</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>ESR (Westergreen)</td>
<td>Male</td>
<td>Blood</td>
<td>up to 5, up to 10</td>
<td>mm/hr</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>FBP</td>
<td>Infant</td>
<td>Blood</td>
<td>10,000-25,000, 6,000-18,000, 6,000-15,000, 4,500-13,000, 4,000-11,000</td>
<td>/mm_ of blood</td>
</tr>
<tr>
<td></td>
<td>- WBC</td>
<td>Children &lt;1 year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Children 4-7 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Children 8-12 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adult</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- RBC</td>
<td>Male</td>
<td>Blood</td>
<td>5.0-10 x 10, 4.8-10 x 10</td>
<td>/litre of blood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Platelet</td>
<td>Male and Female</td>
<td></td>
<td>150-400 x 10^9</td>
<td>/litre of blood</td>
</tr>
<tr>
<td>10.</td>
<td>Glucose</td>
<td>Fasting</td>
<td>Blood</td>
<td>3.5-5.5</td>
<td>mmol/l</td>
</tr>
<tr>
<td></td>
<td>- Random</td>
<td>Random</td>
<td></td>
<td>4.4-10</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Body weight</td>
<td>Urine</td>
<td></td>
<td>nil</td>
<td></td>
</tr>
</tbody>
</table>
ANNEX 2: GUIDELINES FOR ADVERSE DRUG REACTION REPORTING

What is Pharmacovigilance?
Pharmacovigilance is defined as the science and activities concerned with the detection, assessment, understanding and prevention of adverse reactions to medicines (i.e. adverse drug reactions or ADRs). The ultimate goal of this activity is to improve the safe and rational use of medicines, thereby improving patient care and public health.

What is an Adverse Drug Reaction (ADR)?
Adverse Drug Reaction (ADR) or adverse reaction as a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse or abuse of a medicine.

Who should report Adverse Drug Reactions?
All Health care workers, including Doctors, Pharmacists, Nurses and other Health professionals are encouraged to report all suspected adverse reactions to medicines (including vaccines, X-ray contrast media, Traditional and Herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.

Is the event possibly an ADR?
The following factors should be considered when an adverse drug reaction is suspected:

1. What exactly is the nature of the reaction? *(describe the reaction as clearly as possible and where possible provide an accurate diagnosis)*

2. Did the reaction occur within a reasonable time relationship to starting treatment with the suspected medicine? *(some reactions occur immediately after administration of a medicine while others take time to develop)*

3. Is the reaction known to occur with the particular medicine as stated in the package insert or other reference? *(If the reaction is not documented in the package insert, it does not mean that the reaction cannot occur with that particular medicine)*

4. Did the patient recover when the suspected medicine was stopped? *(some reactions can cause permanent damage, but most reactions are reversible if the medication is stopped)*

5. Did the patient take the medicine again after the reaction abated (i.e. rechallenge).
   If so, did the same reaction occur again? *(In most situations it is not*
possible or ethical to rechallenge the patient with the same medicine. If such information is available or if such a rechallenge is necessary, recurrence of the event it is a strong indicator that the medicine may be responsible.

6. Can this reaction be explained by other causes (e.g. underlying disease/s; other medicine/s; toxin or food)? (It is essential that the patient is thoroughly investigated to decide what the actual cause of any new medical problem is. A medicine-related cause should be considered, when other causes do not explain the patient’s condition)

What types of reactions should be reported?
The following adverse drug reactions should be reported:
• All ADRs to newly marketed drugs or new drugs added to the EDL.
• All serious reactions and interactions.
• ADRs that are not clearly stated in the package insert.
• All adverse reactions or poisonings to traditional or herbal remedies.

“Report even if you are not certain the medicine caused the event”

What Product Quality Problems should be reported?
The following product quality problems should be reported:
• Suspected contamination
• Questionable stability
• Defective components
• Poor packaging or labeling
• Therapeutic failures

How can ADRs be prevented from occurring?
Some ADRs are unavoidable and cannot be prevented. However, most ADRs can be prevented by following the basic principles of rational use of medicines.

How are adverse drug reactions reported?
An Adverse Drug Reaction Report Form should be completed in as much detail as possible and return to:

Pharmacovigilance Center,
Zanzibar Food and Drug Board,
P.O.Box 236,
Zanzibar.
Tel /Fax: +255-24-2233959
E-mail: znzfdb@yahoo.com
Website: www.zanhealth.info/zfdb
Adverse Drug Reaction Reporting Form

Date ……………./…………./……………

NAME OF HEALTH FACILITY ………………………………………………………………..

I. PATIENTS INFORMATION

Full Name …………………………………………………………… Age ………

Sex Male Female

Address ……………………… Shehia …………………..

District ……………………… Weight (Kg) …………… Reg.No ……………

((Tick √ in the left box provided)

<table>
<thead>
<tr>
<th>Is the patient pregnant</th>
<th>YES</th>
<th>NO</th>
<th>NOT SURE</th>
<th>NOT APPLICABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Tick √ in the box provided)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If YES, when was the Last Menstrual Period / Date……./……./…….
II. DETAILS OF ADVERSE REACTION  ((Tick √ in the left box provided)

| Date reaction started ……./……./……….
| Date reaction stopped……../……./……….
| **Describe the adverse reaction or problem**

<table>
<thead>
<tr>
<th>Symptoms &amp; signs of the reaction</th>
<th>Severe skin reaction</th>
<th>Anaphylactic shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild skin reaction</td>
<td>Eye symptoms</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal symptoms</td>
<td>Neurological signs</td>
<td></td>
</tr>
</tbody>
</table>

Other symptoms/signs (specify)

III. SUSPECTED DRUG(S)/HERBAL PRODUCTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Strength</th>
<th>Route used</th>
<th>Dose &amp; Frequency</th>
<th>Date Started</th>
<th>Date stopped</th>
<th>Therapeutic indication</th>
</tr>
</thead>
</table>

Other Drug (s)/Herbal Products taken – including self medication

Source of the Drug/Herbal Product (Tick √ in the left box provided)

<table>
<thead>
<tr>
<th>Hospital/Dispensary</th>
<th>Herbalist/Traditional Healer</th>
<th>Others (specify)</th>
<th>Was the drug prescribed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy</td>
<td>Relative/Neighbor</td>
<td>Others (specify)</td>
<td>YES</td>
</tr>
<tr>
<td>Over the Counter (OTC)</td>
<td>Unknown</td>
<td></td>
<td>NO</td>
</tr>
</tbody>
</table>
IV. MANAGEMENT OF THE REACTION

<table>
<thead>
<tr>
<th>Did you stop the drug</th>
<th>YES</th>
<th>NO</th>
<th>Did you reduce the drug</th>
<th>YES</th>
<th>NO</th>
<th>Treatment of Adverse Reaction</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovered completely</td>
</tr>
<tr>
<td>Died due to adverse reaction</td>
</tr>
<tr>
<td>Date recovered ……./…./………….</td>
</tr>
<tr>
<td>OTHER RELEVANT DETAILS</td>
</tr>
<tr>
<td>(Eg. Laboratory tests results, allergies or other medical history)</td>
</tr>
<tr>
<td>Not yet recovered</td>
</tr>
<tr>
<td>Died , unrelated to drug</td>
</tr>
<tr>
<td>Recovered with defects</td>
</tr>
<tr>
<td>Unknown</td>
</tr>
</tbody>
</table>

V. REPORTER INFORMATION

<table>
<thead>
<tr>
<th>Full Name</th>
<th>Ward/Depart/Unit</th>
<th>Qualification</th>
<th>Tel No &amp; E-mail</th>
<th>Date</th>
<th>Signature</th>
</tr>
</thead>
</table>

ANNEX 3: STANDARD TREATMENT GUIDELINES MODIFICATION FORM

Please indicate the nature of modification by marking the appropriate box:

☐ Additional of new disease to the list (Please include epidemiological data as well as a treatment guideline)

☐ Replacement of a listed medicine (Please include data on the proven benefits of the recommended medicine in relation to the listed medicine to be replaced).

☐ Inclusion of a new medicine (Please include data on the benefits of such an addition)

Proposed modification:

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Submission received from:

Name: .................................................................................................................................
Address: ..............................................................................................................................