STANDARD TREATMENT GUIDELINES

05

REPUBLIC OF ZAMBIA
Ministry of Health

ZAMBIA STANDARD TREATMENT GUIDELINE

2020

RECOMMENDED CITATION

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The information presented in these guidelines conforms to the current evidence-based practice. Contributors, reviewers and editors cannot be held responsible for omissions, individual responses to medicines and other consequences. The views expressed herein do not necessarily represent the views of the Clinton Health Access Initiative and other cooperating partners that supported the production of these guidelines.

FOREWORD

Achieving long term improvements in the rational use of medicines and care of the sick requires building the competences of the health care professionals. This fourth edition of the Standard Treatment Guidelines is an update of the earlier version contributing to rational and cost-effective health care designed under the aspirations and spirit of increasing efficacy of decision making and precision in prevention, diagnosis, treatment, alleviation of disease and improved quality of life for the Zambian people as cited in the National Drug Policy.

I commend the Clinton Health Access Initiative (CHAI) for financial assistance to the Zambia National Formulary Committee for developing and producing these Standard Treatment Guidelines as an educational strategy for managing the common conditions afflicting the Zambian people. As usual, the book has been improved to make it more user-friendly, pocket-size, with information on disease conditions Descriptions, diagnoses and on how to develop therapeutic interventions. The Committee upheld the original intent of making the document a reference material for all health care providers, particularly medical doctors, pharmacists, dentists, nurses, clinical officers and all those with primary responsibility for prescribing, dispensing and administration of medicines.

The first edition proved to be a very popular reference document to clinical students and other health care workers contracted to provide health services in Zambia. This book is designed to augment that erstwhile intent. I recommend that you read and use the information herein to serve better those most in need. Whether you work at the University Teaching Hospital, Mpulungu, Lukulu, Monze, Chama or Chinyama Litapi, the information will help you provide good quality, safe, effective and affordable health care.

Dr Kennedy Malama
Permanent Secretary - Technical Services
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ACKNOWLEDGMENTS

The Zambia National Formulary Committee is grateful to the Ministry of Health for the support given to review and produce the fourth edition of the Standard Treatment Guidelines, Essential Medicines List, and Essential Laboratory Supplies for Zambia. The committee is indebted to the United Nations Population Fund (UNFPA) and the Clinton Health Access Initiative (CHAI) for the technical and financial support towards the development and printing of this book.

The fourth edition has a number of chapters re-edited and revised as necessary. The new sections on Malaria in pregnancy, elimination of mother to child transmission of HIV have been added.

Management of infectious diseases requires the rational use of antimicrobials to preserve their effectiveness. Drug-resistant microbes causing public health diseases such as TB, Malaria, and HIV/AIDS now threaten successful treatment of infectious diseases. Health gains achieved by priority health programs - including tuberculosis (TB), malaria, acute respiratory infections (ARI), diarrheal diseases, sexually transmitted infections (STIs) and HIV/AIDS - are increasingly threatened by the growing worldwide problem of antimicrobial resistance (AMR). If we do not preserve our heritage of current antimicrobials, in a few years we are going to have hospitals filled with patients with resistant infections.

The credit of shaping this document into its present form is shared by many individuals. We thank the untiring efforts and commitment provided by the Committee members and those co-opted to contribute. This book was written by a multi-disciplinary interdependent team of reviewers and editors who worked together on all aspects of reviewing, writing, editing and producing the book. Each member brought a wealth of knowledge, talent and experience in health care. Together the committee members met several times and at different venues, critically analyzed the revisions and shared their experiences with evidence to produce this document with a power to improve the alleviation, provide relief to ailments and care of the people.

We also thank individuals and groups of professionals who offered a constructive critique of the previous edition that enabled improvements on this document.

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INTRODUCTION

The Standard Treatment Guidelines were developed after wide consultations and discussions with healthcare providers at three tires of the health delivery system – practitioners, program managers and health economists. While most of the key information has been retained, extensive revisions were carried out on some of the chapters such as HIV and AIDS, psychiatric conditions, STI, and eye conditions. While some of the changes to treatment strategies were motivated by the dynamism of the conditions and availability of more effective medicines and conformity with national disease-specific guidelines, some of them were influenced by the new treatment strategies as guided by the World Health Organization and evidence from clinical studies. Antiretroviral therapy of HIV infections in adults, adolescence, infants and children were adopted from WHO guidelines as recommended for a public health approach. The guidelines are based on a comparison between various drug therapies and on consideration of value for money and the most effective, affordable and current practices that produce health outcomes of improved quality of life and alleviation of suffering. They are also based on the essential drugs and medical supplies concepts to meet the basic health needs of the Zambians as close to the family as possible as envisioned by the National Drug Policy.

The essential medicines and laboratory supplies listed in the Essential Medicines and Essential Laboratory Supplies Lists are linked to the standard treatment guidelines as indicative of public health priorities for the pharmaceutical systems. The lists are based on national clinical choices that the Government of the Republic of Zambia makes available and accessible to its citizens at all times. The medicines and supplies selection was also based on sound and adequate information of efficacy from clinical settings, evidence of performance from different health care settings, availability in a form in which quality, stability in the Zambian weather and storage settings, bioavailability and users are assured. In addition, the total cost of treatment and methodology of administration were also considered.

The Medicines and Therapeutic Committees and hospital and district health management teams are mandated to use these Guidelines and Lists as management tools to improve the quality of the health care delivery and meet the public health responsibility of transparency and accountability. Individual

health care professionals are encouraged to use the guidelines as a companion in the course of health care delivery provision.

ARRANGEMENT OF INFORMATION

The guideline text divisions into chapters according to a particular system of the body or an aspect of medical care has been retained.
Chapters are divided into sections providing introductory notes for health care providers who include doctors, pharmacists, nurses and other health professionals. This information is intended to assist with decision making and selection of appropriate treatment.

Descriptive information about the disease or condition is outlined in the following manner:

- Description of disease or condition
- Clinical features
- Diagnosis
- Complications
- Treatment
  – Supportive
  – Drugs
- Prevention

MEDICINE SAFETY MONITORING (PHARMACOVIGILANCE)

This chapter provides guidance about pharmacovigilance practice required by all users of medicines and the actions to take to report medication safety concerns in general.

ZAMBIA ESSENTIAL MEDICINES LIST

This list contains an appropriate range of essential medicines for the various levels of health care delivery institutions in the country.

ESSENTIAL LABORATORY SUPPLIES AND REAGENTS

This list contains the most essential laboratory supplies and reagents for laboratory use.

INDEXES

Indexes have been included listing the drugs in alphabetical order by approved name or INN, and the diseases and conditions dealt with in the guidelines.

PRESCRIBER CONTROL AND DRUG AVAILABILITY

No prescriber categories are provided in the text of this edition. Medicines and Therapeutics Committees are expected to:

i. Control the prescribing practices of respective institutions.
ii. actively define policies for prescribing within a hospital, health centre, clinic or district.
iii. Ensure the range of availability of drugs in any institution should be restricted according to the level of institution and the categories of staff prescribing.

Prescribers are advised to follow rational prescribing practices, outlined in these standard treatment guidelines which emphasise the public priority use of essential medicines and laboratory supplies and economic treatment regimes.

REVISION OF STANDARD TREATMENT GUIDELINES CONTENTS

The Zambia National Formulary Committee recognises the fact that the field of treatment regimens and drugs is dynamic, thus a revision of the guideline contents will be continuous. Contributions are encouraged and should be submitted for consideration to the Zambia National Formulary Committee through the Ministry of Health.

Dr KOR Chiyeñu
Chairperson, Zambia National Formulary Committee

1. GASTRO-INTESTINAL CONDITIONS

1.1. ABDOMINAL PAIN

Abdominal pains include gastritis and peptic ulcer disease

1.1.1. Gastritis

Description
This is divided into acute and chronic gastritis. In acute gastritis, there is inflammation of the superficial gastric mucosa. It can occur as a result of ingestion of drugs such as acetyl salicylic acid and other non-steroidal anti-inflammatory drugs (NSAID) and alcohol.

Chronic gastritis is divided into 3 categories:

- Type A (autoimmune) gastritis seen in pernicious anaemia and also in other autoimmune diseases.
- Type B (bacterial) gastritis, which is associated with Helicobacter pylori.
- Type C (chemical) gastritis, which is due to repeated injury with bile reflux or chronic ingestion of NSAIDs.

Clinical features:

- Indigestion
- Vomiting
- Gastrointestinal haemorrhage
- Epigastric pain

Most chronic gastritis is asymptomatic.

Diagnosis:

- Endoscopy

Treatment

- Remove offending cause.

1.1.2. Chronic Peptic Ulcer Disease

Description:
Most peptic ulcers occur in the stomach or proximal duodenum but can also occur in the oesophagus (with oesophageal reflux).

Clinical features:

- Epigastric pain
- Indigestion
- Flatulence
- Heartburn
- Anorexia; weight loss may occur

Diagnosis:

- Endoscopy
- Barium meal

Many patients, particularly the young presenting with indigestion, can be treated symptomatically for 4-5 weeks without investigation.

Complications:

- Change of the oesophageal mucosa (Barrettes oesophagus) which is pre-malignant.
- Anaemia and frank haemorrhage
- Recurrent aspiration pneumonia when stricture formation is present
- Perforation of peptic ulcer
- Pyloric stenosis

Treatment:
Drugs
Antacids often relieve symptoms. They are best given when symptoms occur or are expected usually between meals and at bedtime;

- Magnesium trisilicate compound chewable tablet 250 - 500mg to chew when required or;
- Aluminium hydroxide chewable tablet 500mg - 1g to chew when required
  OR
- Magnesium trisilicate suspension 250mg with dried Aluminium hydroxide 120mg 10ml orally 3 times daily OR
- Aluminium hydroxide (dried Aluminium hydroxide 500mg) 5 - 10ml orally 4 times daily; Children 6 - 12 years 5ml orally 3 times daily;
- Adults 1 - 4 tablets to be chewed 4 times daily between meals and at bedtime or as required.

Ulcer healing drugs

a) H_2–receptor antagonists

Cimetidine 400mg tablets twice daily (with breakfast and at night) or 800mg at night for at least 4 weeks. Maintenance 400mg at night or 400mg morning and night.

Reflux oesophagitis:

- Cimetidine 400mg 4 times daily for 4 – 8 weeks.
- Ranitidine 150mg tablets twice daily (with breakfast and at night) or 300mg at night for 4 – 8 weeks, up to 6 weeks in chronic episodic dyspepsia. Maintenance 150mg at night.
- Ranitidine 150mg twice daily or 300mg at night for up to 8 weeks or if necessary 12 weeks.

b) Proton pump inhibitors

- Omeprazole 20mg tablets daily for 4 weeks followed by a further 4 – 8 weeks if not fully treated.
- Long term management of acid reflux disease. Omeprazole 10mg daily increasing up to 20mg if symptoms return. Not recommended for children.

c) Tripotassium dicitratobismuthate (Bismuth chelate)

- Liquid 12mg/5ml. 10ml twice daily or 5ml 4 times daily for 28 days followed by a further 28 days if necessary. Not recommended for children.
- Tablets 120mg. 2 tablets twice daily or 1 tablet 4 times daily for 28 days followed by a further 28 days if necessary.

d) Triple therapy regimens:

1-week regimen

- Amoxycillin 500mg 3 times daily

  Plus
- Metronidazole 400mg 3 times daily

  Plus
- Omeprazole 20mg twice daily or 40mg once daily for 7 days

  OR
- Clarithromycin 500mg daily twice daily

  Plus
- Metronidazole 400mg (or Tinidazole 500mg) twice daily

  Plus

Omeprazole 20mg twice daily or 40mg once daily for 7 days.

1.2. DIARRHOEA

Description

Diarrhoea is an increase in the frequency and volume of stools with an alteration in the consistency, mainly due to increased water content. There are two types of diarrhoea:

Acute Chronic

1.2.1. Acute diarrhoea

This is diarrhoea of sudden onset, often short-lived and is self-limiting. It requires no investigation or treatment. It is often seen after dietary indigestion. It may also be as a result of infections.

1.2.2. Acute diarrhoea in children

This is common of viral origin (e.g. Rotavirus, Norwalk virus, Adenoviruses or Enterovirus), but may also be caused by bacteria or other parasitic infections.

Clinical features:

In addition to diarrhoea, there may be fever, abdominal pain and vomiting. If the diarrhoea is particularly severe, dehydration can be a problem.

With mild dehydration, there may be no signs. With moderate dehydration, the child may present with the following:

- Irritability, restlessness Sunken eyes
- Dry mouth and tongue, absence of tears
- Thirst
- Skin pinch goes back slowly

With severe dehydration, the child may present with:

- Lethargy or loss of consciousness
- Absence of tears
- Very dry mouth and tongue
- Thirst associated with poor drinking
- Skin pinch that goes back very slowly

Treatment:

Investigations are necessary if diarrhoea has lasted more than 1 week. In the meantime, supportive treatment should be given.

Stools should be sent for microscopy and culture; any infective causes should be treated appropriately.

Fluid management - *See section on Cholera*.

In addition, the child should continue to feed on breast milk or other feeds.

Anti-diarrhoeal drugs are not recommended

Prevention:

- **Acute** Provision of clean water/sanitation
- Good disposal of faecal matter
- Boiling drinking water
- Chlorination of drinking water
- Personal hygiene - handwashing preferably with soap and running water after use of the toilet, when preparing food and before eating.

1.2.3. diarrhoea in adults

Clinical features:

In addition to diarrhoea, there may be fever, abdominal pain and vomiting. Dehydration can also be a problem if the diarrhoea is severe. This may be mild, moderate or severe in nature.

- *Mild dehydration:* The patient does not show enough signs to classify as moderate or severe dehydration.

- *Moderate dehydration:* The patient has two or more of the following signs:
  – Restlessness
  – Irritability
  – Sunken eyes
  – Dry mouth and tongue
  – Absence of tears
  – Thirsty, drinks eagerly

- *Severe dehydration*: The patient is classified as having severe dehydration if there are two or more of the following signs:
  – Lethargic or unconscious; floppy
  – Absence of tears
  – Very dry mouth and tongue
  – Very thirsty, drinks poorly or unable to drink
  – Pinched skin goes back very slowly

Other signs in adults and children above 5 years are absent radial pulse and low blood pressure.

Diagnosis:
Investigations are necessary if the diarrhoea lasts more than one week, i.e., stool microscopy, culture and drug susceptibility.

Treatment:

1. Fluid replacement
   Fluid therapy *(See the section on Cholera)*

2. Drug treatment
   In chronic diarrhoea and HIV-related diarrhoea where the cause has not been found:
   - Loperamide 2mg three times daily
   - Codeine phosphate 30mg four times daily

Any infective causes should be treated according to antimicrobial sensitivity patterns.

Prevention:
As for acute diarrhoea in children

1.2.4. Chronic/Persistent Diarrhoea

Description
This generally is diarrhoea lasting more than 2 weeks.

Causes include:

- Infections such as giardia, cryptosporidium, lsospora belli and microsporidia in AIDS patient.
- Colonic lesions such as carcinoma, Crohn's disease and ulcerative colitis
- Coeliac disease, Tropical sprue, Chronic pancreatitis
- Pseudo membranous colitis
- Thyrotoxicosis
- Diabetes

Clinical features:
Clinical features may include:

- Diarrhoea, bloody diarrhoea or steatorrhoea Abdominal pain and vomiting
- Weight loss
- Anaemia

Diagnosis Investigations:

- Stool microscopy, culture and sensitivity
- Special tests may be needed for certain parasites such as cryptosporidium, isospora and microsporidia
- Rectal/jejunal biopsy
- Barium enema
- Full blood count

Treatment:
Treat infective causes of chronic diarrhoea.

i. Fluid therapy – Oral fluid use should be stressed except for patients presenting with severe dehydration in whom intravenous fluids should be used. However, even with severe dehydration, oral fluids should be given concurrently. Fluid management is as for cholera *(See the section on Cholera)*.

ii. Drug treatment - Antidiarrheal agents

- Loperamide 2mg three times daily
- Codeine phosphate 30mg four times daily
- Nitazoxanide 100mg suspension;
  Child 1 - 3 years 5ml twice a day with food for 3 days;

4 - 11 years 10ml twice a day with food for 3 days;
12 years and above, 500 mg tablets three times a day with food for 3 days.

Treat specific causes such as:

- *Giardia* – Metronidazole 400mg 8 hourly orally for 7 days
- *Isospora Belli* – Co-trimoxazole 960mg four times daily orally for 10 days. Give Pyrimethamine for sulpha-allergic patients. Recurrences tend to occur.
- *Cryptosporidia* – Albendazole 400mg twice daily orally for one month may help although combination antiretroviral therapy (cART) with immune reconstitution is the main line of management.

Prevention:

- As for acute diarrhoea.
- Prevention of HIV infection

1.3. DYSENTERY

Description
Dysentery is the passage of bloody diarrhoea or mucus or both in the stool. There are two types of dysentery:

- Bacillary
- Amoebic

1.3.1. Bacillary Dysentery

Bacillary dysentery is caused by the bacteria *Shigella* which has a short incubation period, usually being 2 days.

Clinical features:

- Acute onset
- Malaise
- Fever
- Watery diarrhoea
- Bloody diarrhoea with mucus Faecal urgency
- Severe cramping abdominal pain

- Nausea
- Vomiting
- Headache
- Convulsions (in children)
- Tenesmus
- Mild or moderate dehydration

Diagnosis:
- Stool Microscopy may show leukocytes
- Stool culture and susceptibility test

Treatment
Drugs:
- The first drug of choice is Nalidixic Acid.
  Adult: 1g orally 4 times a day for 7 days
  Child: 50mg/ kg body weight orally in 4 divided doses for 7 days
  OR
  Ciprofloxacin - children 15mg/kg; adults 500mg twice daily for 3 days.

Use of Ciprofloxacin in children is contraindicated except where the benefit outweighs the risk.
Complications of Shigella type 1 infection include:
- Arthritis
- Conjunctivitis
- Colonic perforation
- Septicaemia
- Haemolytic uraemia syndrome
- Metabolic disorders
- Encephalopathy
- Toxic megacolon and
- Rectal prolapse in children

Prevention:
- Drink clean, boiled/chlorinated water
- Good sanitation
- Good personal hygiene

1.3.2. Amoebic Dysentery

Description
Amoebic dysentery is caused by the parasite *Entamoeba histolytica*.

Clinical Features
- Bloody diarrhoea with mucus
- Low-grade fever
- Dehydration is unusual

Diagnosis
- Stool microscopy
- Sero diagnosis

Treatment
Drugs
- Metronidazole

Adult: 800mg orally 3 times daily for 5 days followed by Diloxanide furoate 500mg 3 times daily for 10 days (for the eradication of cysts)

Child: 1 – 3 years, 200mg orally 8 hourly for 5 days; 3 – 7 years, 200mg orally 6 hourly for 5 days; 7 – 10 years, 400mg orally 8 hourly for 5 days

OR
- Tinidazole

Adult: 2g daily for 2 – 3 days.
Child: 50 – 60 mg/kg orally for 3 days.

Avoid the use of anti-diarrhoea agents

Supportive
- Fluid replacement – *Refer to chapter 1.5*
- Analgesics

Complications
- Fulminant colitis
- Colon perforation
- Peritonitis
- Chronic infection

- Stricture formation
- Severe haemorrhage
- Amoebic liver abscess
- Amoeboma

Prevention

- Good disposal of excreta - good pit latrines, flush toilets
- Provision of clean water
- Boiling water. This kills amoeba cysts if the water is boiled for at least 10 minutes.
- Chlorination of water - effects variable on an amoeba.
- Personal hygiene - washing of hands after use of the toilet, when preparing food and before eating.

1.4. CHOLERA

Description

Cholera is an illness characterized by excessive diarrhoea and vomiting caused by the organism *Vibrio cholerae*. It is transmitted by the faecal-oral route.

Clinical features

The incubation period varies from a few hours to 6 days. Cholera may be present as a mild illness indistinguishable from diarrhoea due to other causes. Classically, however, it has three phases:

- Evacuation phase characterised by abrupt onset of painless, profuse watery diarrhoea associated with vomiting in severe forms. Stools may be rice-water.

- Collapse phase is reached if appropriate treatment is not given. This is characterised by features of circulatory shock (cold clammy skin, tachycardia, hypotension and peripheral cyanosis) and dehydration (sunken eyes, hollow cheeks and diminished urine output. There may also be muscle cramps.

Children may also have convulsions due to hypoglycaemia. Complications such as renal failure and aspiration of vomitus may occur.

- Recovery phase occurs if the patient survives the collapse phase.

Diagnosis

- Largely clinical
- Stool and rectal swabs for culture

Treatment

1. Rehydration
   Patients should be assessed for the degree of dehydration.

Management of mild dehydration

Give Oral Rehydration Salt (ORS) solution or any fluids after each loose stool.

ORS Dose ***Age***	***Amount after each loose stool***
Less than 24 months ***2 – 5 years***	*50 – 100ml after each loose stool* *100 – 200ml*
10 years and above	*As much as the patient wants*

ORS and other fluids should be continued until diarrhoea stops. Breast-fed children should continue to breastfeed normally. Encourage the patient to eat.

Management of moderate dehydration (some dehydration in children)

Give ORS in the first 4 hours as follows:						
Age	**Less than 4 mnths**	4-11 mnths	12-23 mnths	24-59 mnths	5-14 yrs	**15 yrs and above**
Weight	**Less than 5kg**	5-10 kg	10-12 kg	12-19 kg	16-29 kg	**30kg and above**
Amount in ml (approx)	**150ml per hour**	**400 ml per hour**	**600 ml per hour**	**1,500ml per hour**	**2,000 ml per hour**	**3,800ml per hour**

- Monitor the patient frequently
- Reassess the patient after 4 hours using the classification of dehydration. If signs of (moderate) dehydration are still present, repeat the same management. If the patient shows signs of severe dehydration change management to that of severe dehydration.
- Patients should be encouraged to eat and drink as much as they want.
- If the child vomits, wait 10 minutes and then continue giving ORS slowly, i.e. every 2 – 3 minutes.
- Encourage the mother to continue breastfeeding.
- For infants less than six months who are not breastfed also give 100 – 200ml clean water during this period.

Management of severe dehydration
Start intravenous drip with Ringers Lactate or Sodium Chloride 0.9% w/v (normal saline) immediately (give ORS while drip is being set).

Patients below 1 year:

- Give 100ml/kg in 6 hours as follows:
  30ml/kg in the first 1 hour then 70ml/kg in the next 5 hours.

Reassess the patient very frequently.

- If the patient can drink, give about 5ml/kg per hour of ORS in addition to the IV fluid.
- Assess the state of re-hydration after six hours using the classification of dehydration level chart; classify and manage accordingly.
- If the patient shows no sign of dehydration after treatment with IV fluids or ORS, continue ORS as follows:
  – Less than 24-months old
  = 100ml after each loose stool
  – 2 – 9 years-old
  = 200ml after each loose stool
  – 10 years or more

= as much as the patient wants (at least 300ml)

Patients 1 year and above:

- Give IV fluids, 100ml/kg in 3 hours as follows: 30ml/kg as rapidly as possible (within 30 minutes), then

70ml/kg in the next $2^{1}/_{2}$ hours.

Reassess the patient very frequently.

- If the patient can drink, give about 5ml/kg per hour of ORS in addition to the IV fluid.
- Assess the state of rehydration after 3 hours using the classification of dehydration on treatment charts; reclassify and manage accordingly.
- If the patients show no sign of dehydration after treatment with IV fluids or ORS continue ORS as follows:

- 24 months old = 100ml after each loose stool
- 2 – 9 years old = 200ml after each loose stool
- More than 9 years = as much as the patient wants (at least 300ml)

Drugs

Medicines should only be given according to the sensitivity patterns.

Recommended Antibiotics *ANTIBIOTICS*	*CHILDREN*	*ADULTS*
Doxycycline *One single dose*	–	*300mg*
Tetracycline *4 times daily* *for 3 days*	*(For children* *>12 years)* *12.5mg/kg*	*500mg*
Erythromycin *Adults: 4 times* *daily for 3 days* *Children: 3 times* *daily for 3 days*	*10mg/kg*	*250mg*

- Doxycycline is WHO antibiotic of choice for adults (except pregnant women) because only one dose is required.
- Erythromycin may be used when the other recommended antibiotics are not available, or where *V. cholerae* is resistant to them.

Prevention

- Drink clean boiled/ chlorinated water
- Good sanitation
- Good personal hygiene and sanitation

1.5. HELMINTH INFESTATION

Description
Helminthic infestation is infection with worms, which belong to several different classes, i.e. Nematodes, Cestodes and Trematode or flukes.

These affect various parts of the body such as the skin, muscles, lymphatics, blood or gastrointestinal tract.

Trematodes or flukes will be presented under schistosomiasis.

1.5.1. Nematodes

1.5.1.1. Non-intestinal
1.5.1.1.1. Filariasis
The adult worms are threadlike. The large females give birth to larvae known as microfilaria. These require two hosts to complete their lifecycle. The first host is the mosquito culex, aedes, anopheles or other types of flies such as Simulium.

Clinical features
Wuchereria bancrofti
Adult worms are found in the lymphatics and lymph nodes. Larvae grow and mature in the regional lymph nodes for up to 18 months. The patient then presents with fever ranging 39° - 41°C accompanied by lymphangitis, both of which subside in 3 - 5 days. The involved lymphatics appear as red streaks on the skin, are tender and cord-like. The lymphatics of the epididymis, testes

and spermatic cord may be involved. The obstruction phase follows if treatment is not given. This presents with oedema of the lower limbs and scrota. Long-standing oedema produces thick rough skin which may ulcerate.

Complications
Tropical eosinophilia is characterized by either lymphadenopathy, splenomegaly or cough, bronchospasm and asthma-like picture.

Loa loa
Clinical features are caused by adult worms which prefer the subconjunctival and periorbital tissues. The main features are Calabar swellings – painless, localised, transient, hot soft tissue swellings often near joints. They last from a few hours to several weeks. Urticaria, pruritis, lymphoedema, arthritis and chorioretinitis may occur. A meningoencephalitis like picture may occur during treatment.

Onchocerciasis
The incubation period averages 1 year. Initially, a papular, reddish, itchy rash occurs. After repeated infection subcutaneous nodules develop. The nodules may be associated with genital elephantiasis, hydrocele and ocular lesions. Ocular lesions are serious and may cause blindness. Initially, there is excessive tear production, photophobia and the sensation of a foreign body in the eye. Then conjunctivitis, iridocyclitis, chorioretinitis, secondary glaucoma and optic atrophy may occur.

Treatment
Wuchereria bancrofti

- Diethylcarbamazine 2 – 6mg/kg daily in divided doses for 2 – 3 weeks. The course is repeated after 6 weeks. Supportive care is antihistamines or steroids for allergic reactions that can occur. Also associated bacterial infections should be treated and reconstructive surgery can be done on unsightly tissue.

Loa loa

- Diethylcarbamazine, 2 - 6mg/kg daily for 2 - 3 weeks

Onchocerciasis

- Ivermectin 150mcg/kg orally as a single dose. Annual retreatment must be given until adult worms die. In endemic areas not all patients need treatment. Indications for treatment are the threat of eye damage and severe pruritis.

Prevention
Primary prevention is aimed at vector control and protection of humans from vectors.

Mass chemotherapy with Diethylcarbamazine is effective in bancroftian filariasis and loasis.

1.5.1.2. Nematodes - Intestinal

Clinical features

1.5.1.2.1. *Ascaris lumbricoides* (Roundworm)
Infection is acquired by ingesting contaminated food. Infection may be asymptomatic but heavy infections are associated with nausea, vomiting, abdominal discomfort and anorexia. Worms may obstruct the small intestine.

Heavy infections in malnourished children may worsen the malnutrition.

1.5.1.2.2. *Strongyloides stercoralis*
Infection occurs by penetration of the skin by larvae.
After penetration of the skin, a local reaction occurs with itching, erythema, oedema and urticaria. This subsides within 2 days. A week later migration of adolescent worms irritates the upper airways, producing cough and occasionally severe respiratory symptoms. After about 3 weeks, intestinal colonization occurs leading to abdominal discomfort, intermittent diarrhoea and constipation.

Heavy infection may lead to persistent diarrhoea, nausea, anorexia and steatorrhoea.

1.5.1.2.3. *Necator americanus* (hookworm)
Local irritation occurs at the site of larval entry in the skin. 2-weeks later mild and transitory pulmonary symptoms appear. Usually, patients are

asymptomatic. Once larvae reach the small intestine with heavy infections there may be symptoms and signs of anaemia.

1.5.1.2.4. *Trichuris trichiura* (whipworm)

Most infections are asymptomatic. Heavy infection is associated with bloody diarrhoea and mucus, abdominal discomfort, anorexia and weight loss. It may also cause appendicitis and rectal prolapse in children.

1.5.1.2.5. *Enterobius vermicularis* (threadworm)

Intense anal pruritis which is usually nocturnal. Scratching results in dissemination of eggs.

Diagnosis and Treatment

Ascaris lumbricoides (round worms)

- Mebendazole 100mg twice daily for 3 days.

Strongyloides stercoralis

- Thiabendazole 1.5g twice daily for 2 days OR Albendazole. In the hyper-infected patient with disseminated disease, therapy should be for 5 days or longer. As there may be gram-negative septicaemia in this group treatment should include intravenous broad-spectrum antibiotics.

Hook worm - *Necator americanus*

- Mebendazole 100mg twice daily for 3 days. A repeated course may be necessary.

Trichuris trichura (whipworm)

- Mebendazole 100mg twice daily for 3 days.

Enterobius vermicularis

- A single dose of Mebendazole 100mg followed by a second dose 2 weeks later. Family members should also be treated.

Prevention

Personal hygiene, good sanitation and good living conditions.

1.5.2. Cestodes or Tapeworms

Clinical features

Taenia saginata is prevalent in humans in all beef-eating countries. Taenia solium is found in pork eating areas. Symptoms are mild with vague epigastric and abdominal pain and occasional diarrhoea and vomiting. Weight loss is unusual Appendicitis and pancreatitis rarely occur. Proglottids may be found in the faeces, bed or underclothing.

Diagnosis and Treatment
Praziquantel 10 mg/kg as a single dose.

Prevention
Careful inspection of beef or pork for cysticerci (encysted larval forms)
Refrigeration of beef at -10°C for 5 days or cooking at 57°C for a few minutes.

1.5.3. Trematodes or Flukes

1.5.3.1 Schistosomiasis (Bilharziasis)

This is caused by blood flukes (trematodes). Human infestations occur after penetration of the skin or mucous membranes by cercaria, the infective form of the host released by the intermediate snail host into freshwater.

The female fluke produces several hundred eggs a day which penetrate the venous walls, creating small bleeding into the urine (Schistosoma haematobium) or stool (Schistosoma mansoni).

Clinical features
The first clinical sign is a local inflammatory response - swimmer's itch. Within a week or more there is a more generalised allergic reaction with fever, urticaria and malaise. Nausea, vomiting and profuse diarrhoea as well as respiratory symptoms namely cough are common.

Complications
Chronic Schistosomiasis with S. mansoni may lead to portal hypertension with marked hepatosplenomegaly. In S. haematobium infestation there is the development of dysuria and haematuria. Later there may be the development of obstructive uropathy, chronic pyelonephritis, renal failure and bladder carcinoma.
Diagnosis and Treatment

- Praziquantel tablet
  Dose:

For Schistosomiasis caused by all species, the usual dosage for adults and children older than 4 years is 60mg/kg body weight given in three equally divided doses in intervals of 4 - 6 hours on the same day. Some clinicians recommend a lower dosage of 40 mg/kg as a single dose or 2 equally divided doses on the same day, which has been effective in the treatment of schistosomiasis in some patients.

Prevention:

- Use of latrines
- Preventing children from playing in infected water
- Washing with water from a protected well or boiling for 1 - 2 minutes or else use water that has been left to stand for more than 48 hours (this kills the carcaria)

1.6. GIARDIASIS

Description

An intestinal disease caused by infection with *Giardia lamblia*. Prevalence is high in the tropics. Spread is faecal-oral and person to person. The infective form is the cyst.

Clinical features

Many individuals are asymptomatic and are carriers. Others develop diarrhoea, nausea, anorexia, abdominal discomfort and distension. Stools may become pale. If the illness is prolonged, weight loss may develop.

Complication

Growth retardation in children.

Treatment

Adult: Metronidazole 2g as a single dose for 3 successive days. Sometimes a second or third course may be necessary.

Prevention

- Personal hygiene
- Improvement of water quality by boiling water for at least 10 minutes. The effects of chlorination are variable.

2. CENTRAL NERVOUS SYSTEM CONDITIONS

2.1. MENTAL HEALTH AND PSYCHIATRIC ILLNESSES

Introduction:
The current etiological formulation of mental disorder is based on the biopsychosocial model meaning symptomatology is as a result of the interaction of 3 domains: biological, psychological and social. The treatment approach therefore must consist of the same model.

Psychiatric Disorders
- Anxiety Disorders
- Generalized anxiety disorder
- Obsessive-compulsive disorder
- Social anxiety disorder
- Post-traumatic stress disorder
- Panic attack disorder

Mood Disorders
- Bipolar mood disorder
- Bipolar 1 disorder
- Depressive disorder
- Major depressive disorder

Psychotic Disorders
- Brief psychotic disorder
- Schizophrenia
- Paranoid disorder
- Delusion disorder

Diagnosis for the psychiatric disorders are based on Diagnostic and Statistical Manual (DSM) IV or International Classification of Diseases (ICD)

2.1.1. Anxiety Disorders

Introduction
The essential feature about these disorders is that a patient has episodic subjective experiences of false alarm of impending danger when objectively none exists.

2.1.1.1. Generalised Anxiety Disorder

Description

Generalized anxiety disorder is characterized by an excessive level of anxiety and worry almost all the time and the patient has great difficulties in controlling the worry. Patients usually present with somatic complaints.

Clinical Features

- Excessive worry about all activities in life
- Anticipation of doom in all undertakings
- Restlessness
- Insomnia
- Tremors
- Muscle tension
- Poor concentration and memory

Differential Diagnosis

The differential diagnosis is extensive because worry and anxiety are seen in many conditions.

Psychiatric

- Major depressive disorder
- Social anxiety disorder
- Post-traumatic stress disorder
- Panic attack disorder
- Anaemia

Medical

- Hyperthyroidism
- Chronic obstructive airways disorders (asthma, emphysema)
- Seizure disorders
- Drug intoxication/withdrawal
- Cardiac arrhythmias

Management

Investigation

- FBC
- TSH (T3, T4)
- Blood glucose
- CXR

- EEG
- ECG

Treatment
Treatment can either be Psychological (counselling and psychotherapy) or Psychopharmacological. The two treatment approaches can be used singly or in combination depending on the etiological factors at play.

Short Term
1. Psychopharmacology
   - Alprazolam 0.25mg (250 mcg) given 2 or 3 times daily. If required, increases may be made in 0.25mg (250mcg) according to the severity of symptoms and patient response. It is recommended that the evening dose be increased before the daytime doses. Very severe manifestations of anxiety may require larger initial daily doses. The optimal dose is one that permits symptomatic control of excessive anxiety without impairment of mental and motor function. Exceptionally, it may be necessary to increase the dosage to a maximum of 3mg daily, given in divided doses.

Elderly and Debilitated Patients
The initial dosage Alprazolam is 0.125mg (125mcg) 2 or 3 times daily. If necessary, this dosage may be increased gradually depending on patient tolerance and response.

Short courses of treatment should be the rule for the symptomatic relief of excessive anxiety and the initial course of treatment should not last longer than 1 week without reassessment. If necessary, drug dose can be adjusted after 1 week. Prescriptions should be limited to short courses of therapy.

- Lorazepam is given as a second-line drug of choice. The initial adult daily oral dose is 2mg in three divided doses of 0.5mg, 0.5mg and 1mg, or two divided doses of 1mg and 1mg. The daily dose should be carefully increased or decreased by 0.5mg depending upon tolerance and response. The usual daily dose is 2 to 3mg. The optimal dose may range from 1 to 4mg daily in individual patients. Usually, a daily dose of 6 mg should not be exceeded.

The initial daily dose in elderly and debilitated patients should not exceed 0.5mg and should be very carefully and gradually adjusted, depending upon tolerance and response.

- Diazepam 2mg 3 times daily increased if necessary to 10-15mg daily in divided doses may be used in the absence of the above-mentioned drugs.
- Sertraline 50mg once per day is recommended as the initial dose. A gradual increase in dose may be considered if no clinical improvement is observed. Dose changes, if necessary, should be made at intervals of at least 1 week. Do not exceed a maximum of 200mg/day. The full antidepressant effect may be delayed until 4 weeks of treatment or longer.

Administer with food once daily preferably with the evening meal, or, if administration in the morning is desired, with breakfast. Used with caution in patients with renal and/or hepatic impairment.

Maintenance
When a satisfactory clinical response has been obtained, the dose should be reduced (within the 50mg to 200mg range) to the minimum that will maintain relief of symptoms.

Psychotherapy – supportive therapy

Long Term

- Cognitive behaviour therapy

Note
Due to the potential for dependence, Benzodiazepines must be given for 2-6 weeks followed by tapering over a period of 1-2 weeks.

2.1.2. Obsessive-Compulsive Disorder

Description

The essential feature is the symptom of recurrent obsessions or compulsions or both. Obsessions are defined as recurrent, persistent ideas, images or impulses. Compulsions are behaviours or mental acts that are repetitive, purposeful, and intentional that are performed in response to the obsession in a stereotyped fashion.

Clinical Features

Obsessions
Recurrent and persistent ideas, thoughts, impulses, or images that are experienced as intrusive and senseless and cause marked anxiety or distress.

Thoughts, impulses are not simply excessive worries about problems. The person attempts to ignore or suppress such thoughts or to neutralize them. The person recognizes that the obsessions are the product of his or her mind.

Compulsions
Repetitive behaviours or mental acts performed in response to an obsession or rigidly applied rules. Behaviours are designed to neutralize or prevent distress or some dreaded event or situation, but are excessive or not realistically connected with what they are meant to neutralize. The person recognizes his or her behaviour is excessive or unreasonable (except children). Obsessions/compulsions cause marked distress, are time-consuming (more than 1 hr/day), or significantly interfere with the person's normal routine. If another axis one disorder is present, the content of the obsessions or compulsions is not restricted to it. The disturbance is not due to the direct physiologic effects of a substance or general medical condition.

Differential Diagnosis
1. Obsessive-compulsive personality.
2. Obsessive-compulsive disorder spectrum. Bear similarities with OCD.
3. Trichotillomania
4. Body dysmorphic syndrome
5. Tourette disorder
6. Olfactory reference syndrome

Treatment
Short Term

Drugs

- Fluoxetine 20mg/day to 60mg/day is recommended and total dose should not exceed a maximum of 80mg/day
- Clomipramine
  Adults: Initiate with daily doses of 25mg. Dosage may be increased by 25mg, as tolerated, at 3 to 4-day intervals up to a total daily dose of 100mg or 150mg by the end of 2 weeks. Thereafter, the dose may be gradually increased over several weeks to 200mg. Doses above 200mg/day are not generally recommended for outpatients. However, in the treatment of severe cases of Obsessive Compulsive Disorder, daily doses of up to 250mg may be required.

  Children and Adolescents: In children aged 10 to 17 years, an initial dose of 25mg/day is recommended. This may be increased by 25mg, as tolerated, at 3 to 4-day intervals. By the end of 2 weeks, patients may be titrated up to 100mg to 150mg/day or 3mg/kg, whichever is lower. Thereafter, the dose may be gradually increased to 200mg or 3mg/kg whichever is lower. A total daily dose above 200mg should not be used in children or adolescents.

  Elderly and Debilitated Patients: Initially, 20mg to 30mg daily in divided doses is suggested, with very gradual increments, depending on tolerance and response. Blood pressure and cardiac rhythm should be checked frequently, particularly in patients who have an unstable cardiovascular function.

Psychological

- Cognitive behaviour therapy
- Exposure and response prevention

Long Term

- Cognitive behaviour therapy (exposure and response prevention).

2.1.3. Social Anxiety Disorder

Description

The essential feature of social anxiety disorder is an excessive and persistent fear of being in a given social situation where the person might be exposed to the scrutiny of others.

The exposure to or anticipation of the feared situation causes marked anxiety and the person either avoids the situations or endures it with significant distress.

Clinical Features

- Tremors
- Palpitation
- Sweating
- Restlessness

These occur in social settings in which patients are preoccupied with feelings of being negatively evaluated by others.

Differential Diagnosis

1. Shyness
2. Avoidant personality disorder
3. Panic attack

Treatment
Short Term
Drugs

- Alprazolam 250mcg - 500mcg 3 times daily or
- Lorazepam or 1mg - 4mg daily in divided doses as in generalized anxiety disorders above.
- Fluoxetine 20mg administered once daily in the morning. A gradual dose increase should be considered only after a trial period of several weeks if the expected clinical improvement does not occur

Long Term

- Cognitive behaviour therapy.

2.1.4. Post-Traumatic Stress Disorders

Description

Post-Traumatic Stress Disorders (PTSD) are caused by severe psychic-trauma. A psychic-trauma is defined as an inescapable event that overwhelms an individual's existing coping mechanisms.

Clinical Features
The clinical features fall into 3 domains.

1. Re-experiencing
   The trauma is re-experienced in the following ways:
   a) Frequent intrusive memories of the event
   b) Nightmares of the event
   c) Flashbacks
   d) Low self-esteem
2. Avoidance
   All reminders of the events are persistently avoided.
3. Autonomic Hyperactivity
   a) Insomnia
   b) Irritability
   c) Hypervigilance

Diagnosis
Differential Diagnosis
   a) Acute stress disorder
   b) Adjustment disorder
   c) Obsessive-compulsive disorder
   d) Schizophrenia
   e) Drug/alcohol use disorder (intoxication)

Investigation
None

Treatment
The principal treatment modality for PTSD is psychotherapy, such as supportive, psychodynamic cognitive-behavioural, and with medication used to augment the psychotherapy and help reduce the symptoms.

The goals of treatment are:
- To help patients regain self-esteem.

- To again feel in control of themselves and their lives (the opposite of the feelings of helplessness experienced in the trauma).
- To re-work their shattered assumptions.

Phase oriented models are used to conceptualize treatment.

Phase I (Supportive psychotherapy)

Establishing safety, stabilization, symptom reduction and the therapeutic alliance.

Phase II (Cognitive behavioural therapy)

Dealing with a traumatic event; e.g., through remembering, desensitization, de-conditioning and mourning.

Phase III (Insight-oriented psychotherapy)

Restructuring personal schema and integrating the trauma into a meaningful life narrative; i.e., putting the trauma into perspective and moving forward in developing a positive life.

Drug Therapy

The best approach is to choose a medication based on the more problematic target symptoms. This may require a combination of medications, e.g., a Selective Serotonin Reuptake Inhibitor (SSRI) to decrease numbing (withdrawal from society and becoming emotionally indifferent) and depression, and a Benzodiazepine (e.g. Lorazepam) and a Beta-blocker (e.g. Propranolol) (titrate the dose) to decrease autonomic hyperarousal.

2.1.5. Panic Attack Disorder

Description

A panic attack is referred to as a recurrent unexpected discrete episode of intense discomfort or fear.

Clinical features

Palpitations, pounding heart, or accelerated heart rate, sweating, trembling or shaking, sensations of shortness of breath or smothering, feeling of choking, chest pain or discomfort, nausea or abdominal distress, feeling dizzy, unsteady, lightheaded, or faint, derealisation (feelings of unreality) or depersonalization (being detached from oneself), fear of losing control or

going crazy, fear of dying, paraesthesia (numbness or tingling sensations), chills or hot flushes.

Diagnosis
It must meet the ICD 10/DSM IV diagnostic criteria.
Differential Diagnosis

- All types of anxiety disorders
- Anaemia
- Angina
- Asthma
- Hyperventilation
- Epilepsy
- Cocaine
- Myocardial infarction
- Migraine
- Transient ischemic attack
- Phaeochromocytoma
- Hallucinogens

Treatment

Short Term

1. Drugs
    - Lorazepam 2mg Initial adult daily oral dosage in three divided doses of 0.5mg, 0.5mg and 1mg, or two divided doses of 1mg and 1mg. A daily dose of 6mg should not be exceeded. The initial daily dose in elderly and debilitated patients should not exceed 0.5mg and should be very carefully and gradually adjusted, depending upon tolerance and response.

    - Fluoxetine 10mg once initial dose daily for the first week then 20 mg administered once daily in the morning. A gradual dose increase should be considered only after a trial period of several weeks if the expected clinical improvement does not occur.

Long Term

2. Psychotherapy

a) Behaviour therapy

–Applied relaxation

–Deep breathing exercise

–In-vivo exposure

2.2. MOOD DISORDERS

Introduction

Mood disorders are mental disorders whose primary psychopathology is the disturbance of mood. The mood disturbances can either be low (depressed) or high manic/hypomanic.

2.2.1. Bipolar Mood Disorders

This is a spectrum of disorders which is characterized by cyclical disturbance of mood, cognition and related behaviours. It can either present with mania/hypomania symptoms or as depression alternating with mania/hypomania. It consists of:

- Bipolar disorders
- Cyclothymia
- Mood disorder due to general medical condition
- Drug/alcohol-induced mood disorder

2.2.1.1. Bipolar Type I Disorder

Description

It is a subtype of bipolar spectrum of disorders characterized by episodes of manic presentation or alternating episodes of mania and major depressive disorder.

Clinical Features

It is subdivided into 3 domains:

1. Biological
    - Too busy to eat or sleep (Good appetite and sleep)
    - High energy
2. Psychological
    - Over familiarity, high self-esteem, grandiose ideas, freely expressed over-confidence.
3. Social
    - Impulsive, disinhibited (unstoppable) and hyperactive.

Diagnosis

A bipolar mood disorder is a spectrum of the disorder. It is critical to make a definite diagnosis because of treatment implication.

Note: Mania is a cluster of signs and symptoms with a variety of underlying psychopathology. It is not a diagnosis.

Differential Diagnosis

- Major depressive disorder
- Schizoaffective
- HIV
- Syphilitic encephalitic
- Alcohol/drug-induced mood disorder

Investigations
Diagnosis

- Full Blood Count
- Urea & Electrolytes
- Liver function tests (LFT)
- Electroencephalogram (EEG)
- Thyroid-Stimulating Hormone (TSH)
- Vitamin B12
- Pregnancy test
- Pre-treatment Evaluation

A general medical assessment, including history, physical examination, and laboratory evaluation focusing on organ systems potentially affected by each agent, is important before starting these medications.

Severity	*Treatment*	*Dosage*
Mild†	*(Monotherapy)†*	*Lithium – 300mg 3††*
	Mood stabilizer†	*times a day*
Moderate†	*Monotherapy†*	*Carbamazepine – 200 – ††*
	Mood stabilizer †	*600mg/day†*
Severe†	*Mood stabilizer† and Antipsychotic†*	*Sodium valproate †† 250mg†*
††		*3 times/day†*
Severe with†	*Mood stabilizer and*	
psychosis†	*Antipsychotic*	

Treatment
Treatment selection depends on illness severity, associated features such as rapid cycling or psychosis, and, where possible, patient preference.

Short Term

Intermediate
During the intermediate phase, doses will be titrated according to the side effects, therapeutic effect and drug blood level.

Long Term
Patients will be maintained on the mood stabilizer which results in their recovery. Antipsychotic must be tapered down slowly over a period of two-three weeks and finally withdrawn.

Note: A blood level of Lithium 0.8-1.2 mEq/L generally is required to treat the acute onset of episodes of bipolar mood disorders. (A steady-state, stable blood level the morning before the first dose of the day). Changes in dosage require monitoring of lithium levels at least every 5-7 days after the change. Some patients require (and tolerate) levels up to 1.5mEq/L. although higher levels are not advisable because of the risk of toxicity. Treatment with lithium alone may have a relatively slow response rate (up to 2 weeks after a therapeutic blood level) is established.

Lithium should only be used where blood levels of Lithium can be monitored.

2.2.2. Depressive Disorders

Description
A spectrum of disorders is characterized by a low or depressed mood. They consist of the following:

- Major depressive disorder single episode
- Major depressive disorder record
- Dysthymia
- Adjustment disorder with depressed mood
- Mood disorder due to general medical condition

- Substance-induced mood disorder

It is therefore vital to make a definite diagnosis because of management implications. They have different treatment, course and prognosis.

2.2.1.1. Major Depressive Disorder

Description

This is one of the depressive spectra of disorders what man psychopathology is a depressed mood and lack of anhedonia (loss of interest in all general life activities).

Clinical Features

The clinical presentation falls into 3 domains:

1. Biological:
   Insomia/Hyperinsomnia fatigue, weight loss/gain, Agitation/retardation (psychomotor retardation).
2. Psychological:
   Depressed mood, loss of interest in pleasure (anhedonic), sense of guilt, worthlessness, hopelessness, helplessness and sometimes suicidal.
3. Cognitive:

Poor attention, concentration and memory.

Diagnosis

Differential Diagnosis

- Bipolar mood disorder with a depressive episode
- Schizoaffective
- Adjustment disorder with depressed mood
- Substance-induced mood disorder
- Mood disorder due to general medical condition
- Sad mood
- Bereavement

Investigations

- FBC, VDRL, TSH, LFT
- Drug Screen.
- Hamilton depressive scale
- Becks depression inventory

Treatment

The treatment of major depressive disorder consists of antidepressant, psychotherapy and electroconvulsive therapy (ECT) or a combination of these.

Acute Phase

Severity of Major Depressive Episode	*Pharmacotherapy*
Mild	*Antidepressants if preferred by the patient*
Moderate to severe	*Antidepressants are the treatment of choice (unless electroconvulsive therapy (ECT) is planned)*
	s Antidepressants plus antipsychotics or ECT

Intermediate Phase

Titrate the medication according to side effect and clinical response.

Long Term Phase

1. Continue with antidepressants
2. Psychotherapy (cognitive behaviour therapy)
3. Taper the antipsychotic and discontinue over the period of three to four weeks

2.3. PSYCHOTIC DISORDERS

Psychosis refers to the loss of contact with reality (impairment in reality testing). It is not a diagnosis but a symptom of mental disorders with a variety of underlying etiological factors. It is characterized by delusions, hallucinations and thought disorders.

2.3.1. Brief Psychotic Disorder

Description

An acute transient psychotic episode of abrupt onset. Although it can follow a stressful life event, it may be the first clinical feature of a primary mental disorder in a predisposed person.

Clinical Features

1. Delusions
2. Hallucinations
3. Disorganized speech (e.g. frequent derailment or incoherence)
4. Grossly disorganized or catatonic behaviour

Investigations

- Full Blood Count
- U & E
- LFT
- TSH
- EEG
- Chest X-ray
- ECG
- Drug Screen.

Differential Diagnosis

1. Schizophreniform
2. Major depressive disorder
3. Bipolar mood disorder
4. Drug/alcohol-induced psychotic disorder
5. Delirium

Treatment

Short Term

1. Hospitalisation:

For diagnostic evaluation and monitoring signs and symptoms

2. Psychopharmacotherapy:
   - Antipsychotic - See table (flow chart)
   - Adjunctive (Benzodiazepine) – Diazepam or Lorazepam

Long Term

The clinical presentation of brief psychotic disorder is polymorphic. A long-term follow-up is advisable to establish the underlying primary mental disorder.

2.2.3. Schizophrenia

Description

It is a spectrum of disorders which share similar etiological factors but differ in clinical presentation, course and prognosis.

Clinical Features

- Delusions
- Hallucinations
- Disorganized speech (e.g., frequent derailment or incoherence)
- Grossly disorganized or catatonic behaviour
- Negative symptoms, i.e., affective flattening, alogia or avolition.

Differential Diagnosis

- All psychotic disorders including substance-induced psychotic disorder:
  i) Intoxication
  ii) Withdrawal states and Psychotic disorder due to general medical condition

Either	**Agree on the choice of antipsychotic with Patient** **Agree on the choice of antipsychotic with patient and/or care**	**Treatment Algorithm** **Or, if not possible:** **Or, if not possible:**	
	Start second-generation antipsychotic or	First-generation antipsychotic Titrate, if necessary, to minimum effective dose Adjust dose according to response and tolerability	
	Effective	Assess over 6-8 weeks Not effective	Not tolerated or poor compliance
Either Continue at dose established as effective	Change drug and follow above process consider the use of either an SGA or an FGA	Treatment Algorithm If poor compliance related Tolerability, discuss with patient and change drug Not effective	If poor compliance related to other factors, consider depot or compliance therapy or compliance aids
	Repeat above process	Relapse or acute exacerbation of schizophrenia (full adherence to medication confirmed) Treatment algorithm	
Either investigate social or psychosocial precipitants	Continue usual drug treatment	Treatment Algorithm Provide appropriate support and/or Therapy Acute drug treatment required Switch to a different, acceptable Antipsychotic if appropriate Assess over at least 6 weeks	If poor compliance related to other factors, consider depot or compliance therapy or compliance aids
		Treatment ineffective Switch to clozapine Relapse or acute exacerbation of schizophrenia (adherence doubtful or known to be poor	
Either Investigate the reason for poor adherence	Confused or disorganized Lack of insight or support Discuss with patient Consider compliance therapy or depot Antipsychotics	Simplify drug regimen	Poorly tolerated treatment Discuss with the patient Switch to acceptable drug

2.4. EPILEPSY

Description
This is a recurrent abnormal paroxysmal neuronal discharge. Patients may present in several forms, i.e. from simple seizures which will only bring about headache, bad smell or loss of posture and of consciousness to generalized tonic, clonic seizures (grand mal seizures)

Clinical features
These vary depending on the type of seizure involved.

a) Generalised tonic to clonic seizures (grand mal)
These may occur with or without the initial warning aura, characterized by the outcry, loss of consciousness, falling and jerking of the limb s, trunk and head. Urinary or faecal incontinence may occur. The attack usually lasts 2 to 5 minutes and will be followed by any of the following - deep sleep, muscle soreness or headache.

b) Petit mal attacks
Characterized by clouding of consciousness, which could last from 1 - 30 seconds with or without loss of muscle tone. The patient will suddenly stop all activity and have a blank stare. Activity will only be resumed after the attack is over. Commonly occurs in children.

c) Myoclonic seizures
This is characterised by jerking of one or more muscles in any part of the body with or without consciousness. The jerking may start in one part of the body and spread.
Diagnosis
Diagnosis is mainly clinical.

Management
The objective is to control the seizures and prevent reoccurrence.

- A detailed history should be taken and should include
- An eyewitness account of the seizure (if possible)
- Prior trauma, infection, alcohol or other drug involvement will call for a review of the need for continued treatment
- If it is status epilepticus, establish if the patient has been taking the medication regularly in the last 2 weeks before the seizure (including dosage and frequency). Record of other medication used recently

History of family seizures or other neurological disorders

Treatment

Drugs

Most patients will respond favourably to single-drug treatment on anticonvulsants (i.e. Phenobarbitone, Carbamazepine or Phenytoin). Patients who do not respond favourably to maximum doses of these drugs should be referred for specialist treatment.

Patients who have not had seizures for two or more years, neurological signs or symptoms, unacceptable behavioural change or adverse reaction to drugs should all be referred to a specialist for possible discontinuation of drugs.

Supportive

Counselling is necessary for both the patient and caregivers.

Take blood for:

- Urea and electrolytes,
- Glucose
- Electrolytes: Ca^{2+}, Mg^{2+}
- Full blood count
- Arterial gases, and
- Anticonvulsant concentrations

Investigate and exclude possible underlying causes of seizures, e.g. drugs, alcohol, meningitis, hypoglycaemia, trauma, etc.

2.5. FEBRILE CONVULSIONS

Description

These are convulsions occurring mostly among children between six months and five years. They occur during a bout of fever, which is due to an underlying infection. In general, the seizures follow the pattern of clonic-tonic seizures seen in grand mal epilepsy or generalised seizures, but may be atypical and involve only one side of the body.

Management

Prolonged febrile convulsions of 15 or more minutes or those occurring in a child of known risk e.g. a child with ventricular peritoneal shunt must be treated actively.

Drugs

- Diazepam orally or rectally or intravenously 0.6 – 0.5mg/ kg in 24 hours in divided doses is effective in reducing further febrile seizures in children.

- Paracetamol 10mg/kg 4 times a day as required.

Supportive

- Tepid sponging
- Use of antipyretics
- Caregivers will need counselling about the treatment of recurrences.

Commonly Used Anticonvulsants in Adult

SEIZURE TYPE	First-line	Starting dose	Commonest Daily Dose	Maintenance Dose	*Dosage Interval*
Partial Seizures *Simple Partial Complex partial Secondary Generalized*	Carbamazepine Lamotrigine (monotherapy) (Adjunctive VP) (Adjunctive W/T VP) Valproate Phenytoin	100-200mg 25mg 25mg 50mg 50mg 100-200mg	800mg 100mg 25-50mg 300mg 300mg 300mg	400-2000mg 100-200mg 100-200mg 200-400mg 200-400mg 100-700mg	*2-4 times a day 1-2 times a day 1-2 times a day 1-2 times a day 2 times a day 1- 2 times a day*
Generalised Seizures Absences	Ethosuximide Lamotrigine (monotherapy) (Adjunctive VP) (Adjunctive W/T VP) Valproate	500mg 25mg 25mg 50mg 600mg	1000mg 25mg 25mg 300mg 1000mg	500-2000mg 100-200mg 100-200mg 200-400mg 1000-2000mg	*1-2 times a day 1-2 times a day 1-2 times a day 1- 2 times a day 2 times a day*
Atomic/clonic	Lamotrigine (monotherapy) (Adjunctive VP) (Adjunctive W/T VP) Valproate Sodium	25mg 25mg 50mg 600mg	25mg 25mg 300mg 1000mg	100-200mg 100-200mg 200-400mg 1000-2000mg	*1-2 times a day 1-2 times a day 1-2 times a day 2 times a day*
Tonic-Clonic	Carbamazepine Lamotrigine (monotherapy) (Adjunctive VP) (Adjunctive W/T VP) Valproate Sodium	100-200mg 25mg 25mg 50mg 50mg	800mg 100mg 25-50mg 300mg 300mg	400-2000mg 100-200mg 100-200mg 200-400mg 200-400mg	*2-4 times a day 1-2 times a day 1-2 times a day 1-2 times a day 2 times a day*
Myoclonic	**Clonazepam Valproate Sodium**	**1mg 600mg**	**6mg 1000mg**	**4-8mg 1000-2000mg**	***1 at night (3-4 times a day) 2 times a day***

SEIZURE TYPE	Second-line	Starting Dose	Commonest Daily Dose	Maintenance Dose	*Dosage Interval*
Partial Seizures *Simple Partial Complex partial Secondary Generalized*	Acetazolamide Gabapentin Phenobarbitone Acetazolamide	250 mg 300mg 30-60mg 250 mg	500-750mg 600-2400mg 120mg 500-750mg 6 mg	250-1000mg 900 – 1200mg 60-240mg 250-1000mg 4-8mg	*3-4 times a day 3 times a day 1-2 times a day*
Generalized Seizures Absences	Clonazepam	1mg			*3-4 times a day 1 at night (or 3-4 times a day)*
Atomic/clonic	Acetazolamide Carbamazepine Phenobarbitone Phenytoin	250mg 100-200mg 30-60mg 100-200mg	500-750mg 800mg 120mg 300mg	250-1000mg 400-2000mg 60—240mg 100-700mg	*3-4 times a day 3 times a day 1-2 times a day 1-2 times a day*
Tonic-Clonic	Acetazolamide Gabapentin Phenobarbitone	250mg 300mg 30-60mg	500-750mg 600-2400mg 120mg	250-1000mg 600-2400mg 60-240mg	*250-1000mg 600-2400mg 1-2 times a day*
Myoclonic	**Acetazolamide**	**120mg**	**500-750mg**	**250-1000mg**	***3-4 times a day***

Commonly Used Anticonvulsants in Children

Condition	First-line	Starting dose (mg/kg per 24hours)	Target dose for initial assessment of effect (mg/kg per 24 hours)	Incremental Size (mg/kg per 24 hours)	Dose Interval (days)	Usual Effective dose (mg/kg per 24 hours)	*Frequency of dosing (times per 24hours)*
Partial Seizures *Simple Partial*	Carbamazepine	5	12.5	2.5	3-7	12-25	*2-3*
Complex partial Secondary Generalized	Lamotrigine (monotherapy) (Adjunctive VP) (Adjunctive W/T VP) Valproate	- 150microgram 300microgram 5-7.5	- 30	- 300microgram 300microgram 10	- 1 4 14 10	- 1-5 1-5 12.5-15	- *1-2* *1-2* *2*
	Phenytoin	1.5-2.5	7	2.5-5	10	5-9	*1-2*
Generalized Seizures	Ethosuximide	5	15	10	15	10-20	*2*
Absences	Lamotrigine (monotherapy) (Adjunctive VP)	- 150microgram	- 150microgram	- 150microgram	- 150microgram	- 1-5	- *1-2*
	(Adjunctive W/T VP)	300microgram	300microgram	300microgram	300microgram	1-5	*1-2*
	Valproate	5-7.5	5-7.5	5-7.5	5-7.5	12.5-15	*2*
Atomic/Clonic	Lamotrigine (monotherapy) (Adjunctive VP)	- 150microgram	- 150microgram	- 150microgram	- 150microgram	- 150microgram	-
	(Adjunctive W/T VP)	300microgram	300microgram	300microgram	300microgram	300microgram	*1-2*
Tonic – Clonic	Valproate Sodium	5-7.5	5-7.5	5-7.5	5-7.5	5-7.5	*1-2*
	Carbamazepine	5	12.5	2.5	3-7	12-25	*2*
	Lamotrigine (monotherapy) (Adjunctive VP)	- 150microgram	- 150microgram	- 150microgram	- 150microgram	- 150microgram	*2-3*
	(Adjunctive W/T VP)	300microgram	300microgram	300microgram	300microgram	300microgram	-
Myoclonic	Valproate Sodium	5-7.5	5-7.5	5-7.5	5-7.5	5-7.5	*150microgram*
	Clonazepam	50microgram	1	1	50microgram	1	*300microgram 5-7.5*
	Valproate Sodium	**5-7.5**	**5-7.5**	**5-7.5**	**5-7.5**	**12.5-15**	***1 - 2***

SEIZURE TYPE	Second-line	Starting dose (mg/kg per 24 hours)	Target dose for initial assessment of effect (mg/ kg per 24 hours)	Incremental Size (mg/kg per 24 hours)	Dose Interval (days)	Usual Effective dose (mg/kg per 24 hours)	*Frequency of dosing (times per 24hours)*
Partial Seizures	**Acetazolamide**	**2.5**	**7.5**	**5-7**	**1**	**5-7**	***2-3***
Simple Partial	**Gabapentin**	**10**	**10**	**0**	**1,2,3**	**10-20**	***1-***
Complex partial	**Phenobarbitone**	**1-1.5**	**1-1.5**	**2**	**1**	**2.5-5**	***1-2***
Secondary Generalized	**Acetizolamide**	**2.5**	**7.5**	**5-7**	**1**	**5-7**	***2-3***
Generalized Seizures Absences	**Clonazepam**	**50microgram**	**1**	**1**	**50microgram**	**12.5-15**	***1***
	Acetazolamide	**2.5**	**5-7.5**	**5-7**		**5-7**	***2-3***
	Carbamazepin	**5**	**10**	**2.5**	**1**	**2.5-5**	***2-3***
Atomic/clonic	**Phenobarbitone**	**1-1.5**	**1-1.5**	**2**	**3-7**	**2.5-4**	***1-2***
	Phenytoin	**1.5-2.5**	**7.5**	**2.5-5**	**1**	**2.5-5**	***2***
					1		
	Acetazolamide	**2.5**	**5-7.5**	**5-7**		**5-7**	***2-3***
Tonic-Clonic	**Gabapentin**	**10**	**10**	**0**	**1**	**10-20**	***1***
	Phenobarbitone	**1-1.5**	**1-1.5**	**2**	**1,2,3**	**2.5-4**	***2-3***
					1		
Myoclonic	**Acetazolamide**	**2.5**	**5-7.5**	**5-7**		**5-7**	***2-3***
					1		

2.6. RABIES

Description

This is a disease caused by a virus that affects brain cells. This virus is usually found in animal vectors and is transmitted to man.

Vectors which may carry the rabies virus, include:

Domestic animals:

- *Dogs*
- *Cats*

Wild animals:

- *Hyenas*
- *Foxes*
- *Wild dogs*
- *Bats*

Clinical features

Fulminant encephalitis with convulsions, circulatory and respiratory failure. Hydrophobia (fear of water) occurs in advanced stages of the disease.

Diagnosis

Investigation

- Taking a good history
- Laboratory investigation using immunofluorescent microscopy of smear from the cornea or of a skin biopsy
- Brain examination of dead animals or sacrificed animals

Treatment

Standardised treatment of all animal bites and scratches; these should be thoroughly cleaned and flushed with soap and water.

Antibiotics and Tetanus toxoid should also be administered.

Administration of anti-rabies vaccine as soon as possible after exposure. The human diploid vaccine may be used as follows:

Condition of animal	*Treatment in case of Bite Lick*
Healthy, vaccinated with a valid certificate	*None*
Healthy, not vaccinated	*None*
	None
Unknown or escaped	*Vaccine + serum* *Vaccine*
Rabid or suspected	*Vaccine + serum*

Recommended regimen:
1 dose to be given on Day 0; Day 3; Day 7; Day 14 and Day 28.

If the animal is proved to be healthy after the tenth day, no more vaccine is necessary.

All bites by rabid dogs should be reported to the nearest Veterinary Office.

Prevention
Veterinary precautions, which include vaccination of domestic animals, eradication of stray dogs and surveillance control of the epidemiological situation in the wildlife population.

Pre-exposure vaccination:
This is administered to high-risk population groups, e.g. veterinary staff and wildlife department personnel. Two doses of human diploid vaccine with one month's interval, followed by a booster after one year. Repeat booster after every three years.

3. INFECTIONS

3.1. MALARIA

Description

Malaria is a protozoal infection by the genus Plasmodium. It is transmitted through the bite of an infected female mosquito belonging to the genus Anopheles. It is characterised by paroxysms of chills, fever and sweating, and may lead to anaemia and splenomegaly.

Malaria parasites comprising 4 species, each one with a different biological pattern may affect man. Plasmodium vivax, Plasmodium falciparum, Plasmodium malariae and Plasmodium ovale. In Zambia, Plasmodium falciparum is the most prevalent.

Clinical features

Diagnosis

- Take a good history and include all the physical examination and make a differential diagnosis.
- Confirmm the presence of parasites and complications by laboratory methods

3.1.1. Uncomplicated Malaria

Prodromal symptoms are usually non-specific and are often characterise d by intermittent febrile illness. Fever is the most common symptom. Headache, aching joints, back pain, nausea and vomiting and general discomfort usually accompany the fever.

The patient may not present with fever but may have had a recent history of fever. This is due to the natural malaria cycle. A history of fever during the previous two days along with other symptoms of malaria is a critical basis for suspected malaria.

It is equally important to note that fever is a common symptom for other infections besides malaria, such as ear infections, measles and pneumonia. Malaria has been nicknamed "the Great Imitator" because of this. The possibility of other infections, either co-existing with malaria or as the sole cause of fever, should always be borne in mind in arriving at the diagnosis. It is therefore important to carry out a differential diagnosis.

In children, the onset of malaria may be characterized, in the early stages, only by symptoms like poor appetite, fever, restlessness, cough, diarrhoea, malaise and loss of interest in the surroundings.

3.1.2. Severe Malaria

P. falciparum infection in the presence of any life- threatening condition is considered as severe malaria. All life-threatening conditions and the presence of any danger signs in the presence of an acute febrile illness should be considered as possible severe malaria. Some of the danger signs include:

- Excessive vomiting
- Inability to drink or breastfeed
- Extreme weakness
- Convulsions
- Drowsiness
- Loss of consciousness
- Abnormal breathing

Severe headache, sleepiness and loss of consciousness are some of the commonest indications of severe malaria. Jaundice is another early sign.

A patient in whom malaria is suspected and is severely ill requires urgent attention and should be referred to an appropriate health facility, where applicable. Severe malaria particularly in pregnant women and children under five should be managed as an emergency.

Other symptoms and signs of severe malaria include:

- Convulsions (> 2 episodes within 24 hours)
- Coma or altered level of consciousness
- Drowsiness/lethargy
- Prostration (inability to sit or stand without support)
- Respiratory distress
- Pulmonary oedema
- Shock (cold moist skin, low blood pressure, collapse)
- Severe vomiting
- Severe anaemia (Hb <5g/dl or HCT <15%)
- Haemoglobinuria
- Hypoglycaemia (blood glucose <2.2mmol/L or<40mg/%)
- Splenomegaly
- Hepatomegaly
- Abnormal bleeding (spontaneous prolonged bleeding from puncture sites).

Initial Management of Severe Malaria

Antimalarial Treatment

For severe (complicated) malaria, Quinine is recommended, however, intravenous Artesunate could be used as an option to Quinine in treatment of severe malaria where available.

Give Artesunate intravenously. If intravenous administration is not possible, Artesunate may be given intramuscularly into the anterior thigh.

Children: Artesunate 2.4 mg/kg BW IV or IM given on admission (time = 0) then at 12 hr and 24 hr, then once a day is the recommended treatment.

Adults: Artesunate 2.4 mg/kg BW IV or IM given on admission (time = 0) then at 12 hr and 24 hr, then once a day is the recommended treatment.

Give 2.4 mg/kg body weight IV or IM stat, repeat after 12 hours and 24 hours, then once daily afterwards. However once patient regains consciousness and can take orally, discontinue parenteral therapy and commence the full course of recommended ACT, such as Artemether + Lumefantrine fixed-dose combination.

Signs and symptoms of uncomplicated malaria

Uncomplicated Malaria	Severe and complicated malaria
Fever (<_37.5 0C)	**Severe anaemia (Hb<5g/ dl)**

Headache	**Jaundice**
Sweats and chills	**Drowsiness**
Body pains	**Shock**
Acute gastroenteritis	**Convulsions**
	Respiratory distress
	Unconsciousness/coma

	Change in behaviour
	Hyperparasitaemia
	Prostration, i.e., generalized weakness, inability to stand or walk)
	Abnormal bleeding

Treatment

Uncomplicated Malaria

1. The first line of treatment for malaria is Artemisinin-based combination therapy. For instance:
Artemether 20mg + Lumefantrine 120mg tablets

Artemether + Lumefantrine recommended dosing:

Age (years)	Weight (kg)	*Number of tablets Artemether (A) + per dose 0h, 8h, Lumefantrine (L) 24h, 36h, 48h, 60h per dose*	
<1	<5	*Not recommended*	
1 -5	5-14	1	*20mg A + 120mg L*
6 -8	15-24	2	*40 mg A + 240mg L*
9 -12	25-34	3	*60mg A + 360mg L*
Over 12	**>35**	**4**	***80mg A + 480mg L***

Artemether 20mg + Lumefantrine 120mg is not recommended in pregnancy and lactating mothers. Where there is no suitable alternative drug, it should be used.

For those weighing 5kg body weight and below, the drug of choice is Sulphadoxine 500mg + Pyrimethamine 25mg for uncomplicated malaria.

The dosage for Sulphadoxine 500mg + Pyrimethamine 25mg is a single treatment of half a tablet.

Sulphadoxine + Pyrimethamine recommended dosing:

Wt (kg)	Age (years)	Number of Tablets
5-10	2-11months	**0.5**
10.1-14	1-2	**0.75**
14.1-20	3-5	**1**
20.1-30	6-8	**1.5**
30.1-40	9-11	**2**
40.1-50	12-13	**2.5**
>50	**14+**	**3**

For unconscious, persistently vomiting, convulsing or severely ill patients, treat as complicate maa, resuscitate refer.

Severe Malaria

Children:
By intramuscular injection; Quinine 10mg/kg body weight diluted in saline or water for injection (to a concentration of 60 – 100mg salt/ml), repeated after 4hrs and then 12 hourly. A loading dose is not recommended by this route. By intravenous injection; Quinine loading dose of 20mg/kg body weight diluted in 10ml of 5% or 10% dextrose (or isotonic fluid if hypoglycaemia is excluded) per kg body weight by intravenous infusion over 4 hours. After 12hours maintenance dose of 10mg/kg body weight given over 2 hours, repeated 12 hourly until the patient can swallow, then oral Quinine 10mg/kg body weight 8 hourly to complete a 7-day course of treatment.

Adults:
By intramuscular injection, Quinine 10mg/kg body weight diluted in saline or water for injection (to a concentration of 60 – 100mg salt/ml), repeated after 4hrs and then 12 hourly. A loading dose is not recommended by this route. By intravenous injection; Quinine loading dose of 20mg/kg body weight diluted in 10ml of 5% or 10% dextrose (or isotonic fluid if hypoglycaemia is excluded) per kg body weight by intravenous infusion over 4 hours. After 8 hours maintenance dose of 10mg/kg body weight given over 4 hours, repeated 8 hourly until the patient can swallow or after coma resolution, then oral Quinine 10mg/kg body weight 8 hourly to complete a 7-day course of treatment.

Oral Quinine 300mg tablet dosage schedule

Age Years	Number of tablets per dose
<1	**0.25**
1-3	**0.5**
4-6	**0.75**
7-11	**1**
12-15	**1.5**
15+	**2**

Quinine is sometimes used in combination with Tetracycline or Clindamycin, Doxycycline in places where there is reduced sensitivity to Quinine. In Zambia, Quinine sensitivity Is still very high and there is no justification for using the combination.

3.1.3. Malaria in Pregnancy

Intermittent presumptive treatent (IPT) – Sulphadoxine + Pyrimethamine is the drug of choice for prevention of malaria in pregnancy. Sulphadoxine + Pyrimethamine is given after 16 weeks following the last menstrual period (LMP). Two consecutive doses are given at least 4 weeks apart during the second and third trimester. A total of 3 doses should be given during the entire duration of pregnancy.

Individuals who are intolerant to SP should be counselled about personal preventive measures to reduce contact with mosquitoes.

Summary of management ofMalaria

- Take and record a confirmatory history
- Do a confirmatory clinical assessment including body temperature.
- Make a differential diagnosis on clinical basis.

- Do a lumbar puncture if there is need to exclude meningitis
- Prepare a thick and thin blood smear
- Do a full blood count
- Decide on treatment and method of administration.
- Keep treatment, follow-up and referral records. Record treatment failures and adverse events.
- Give oral, subcutaneous or intramuscular medications
- Decide on the need for referral

Supportive therapy

- Monitoring of fluid and electrolyte balance
- Correction of fluid and electrolyte imbalance
- Correct management of anaemia
- Management of hypoglycemia
- Management of any other complications

Referred Patients

Patients referred from the community need to have a thorough clinical examination to exclude other causes of fever.

Criteria for Referral from the Health Centre to Hospital

The following are criteria for a referral from the Health Centre to Hospital:

- Neurological manifestation e.g. convulsions and altered/disturbed consciousness.
- Persistent vomiting
- Hyperpyrexia (>39 ^{0}C).
- Hypothermia (< 35.7 ^{0}C).
- Severe Anaemia.
- Jaundice.
- Pregnancy with fever
- Failure to respond to treatment after 2 days.
- Reaction to drugs interfering with normal daily activity e.g. severe rash, severe itch, sulphonamide sensitivity.
- Conditions that cannot be managed locally
- Rapidly deteriorating condition of the patient.
- Conditions that cannot be managed locally

Prevention

- Get rid of mosquito breeding sites near residential areas
- Use impregnated mosquito nets, repellents and sprays
- Give public health education on the dangers of malaria and how to prevent it.

Counselling Points:

- Provide health education information on malaria i.e. personal protection measures e.g. bed nets, repellents, general sanitation around the house and in the community, such as reducing breeding sites and clearing of vegetation.
- In Children; advise caregiver on the need for growth monitoring, feeding, Vitamin A supplementation and immunisation in children.
- Prophylaxis in sickle cell anaemia and post-splenectomy use Pyrimethamine 25mg once weekly.

Zambia has no prophylaxis policy for visitors. Recommendations are provided from their country of origin. Some countries e.g. the United Kingdom are using Mefloquine. Sulphadoxine + Pyrimethamine is not recommended for this purpose.

The use of other drugs like Amodiaquine, Dapsone-Pyramethamine, (maloprim) and Mefloquine for prophylaxis needs further evaluation and is not therefore recommended.

3.2. TUBERCULOSIS

Description

Tuberculosis is an infectious disease that is caused by the tubercle bacillus, Mycobacterium tuberculosis. The principal route of infection is the respiratory tract through the inhalation of infected air droplet nuclei.

Infection may rarely occur through the gastrointestinal tract from the ingestion of infected unpasteurised milk. Exposure to infection may lead to infection which may be latent.

Subsequent progression to active disease occurs in approximately 100/o during the lifetime in people with a latent infection and an intact immune system. Progression of a latent infection occurs at a higher rate in individuals infected with the Human lmmunodeficiency Virus.

In HIV-infected patients, pulmonary tuberculosis is the commonest form of tuberculosis.

3.2.1. Pulmonary Tuberculosis

Pulmonary tuberculosis classically presents with symptoms of prolonged cough (>2 weeks duration), which is usually productive; and with or without a history of haemoptysis, fever, night sweats and loss of weight. Radiological changes that occur include cavitation, parenchymal infiltrates and lymphadenopathy. Sometimes Chest X-rays may not show any abnormality. Radiological findings in HIV-infected individuals depend on the degree of immunosuppression. Atypical findings are more common in these patients.

Clinical features

Pulmonary Tuberculosis accounts for approximately 800/o of the cases of tuberculosis, with smear-positive tuberculosis being the major source of infection. Extra- pulmonary tuberculosis may involve many sites of the body such as the pleura, pericardium, lymph nodes, meninges, bones, gastrointestinal tract, genito-urinary system, epididymis, eyes and skin.

3.2.2. Pleural tuberculosis

Pleural tuberculosis may present with a cough which may be non-productive, pleuritic chest indent pain, systemic symptoms of fever and night sweats.

3.2.3. Pericardial tuberculosis

Pericardial tuberculosis may present with chest pain or with features of tamponade suc has dyspnoea, tachycardia, hypotension, pulsus paradoxus and sudden collapse of the patient.

3.2.4. Lymph node tuberculosis

Lymph node tuberculosis may affect any site though it is more common in the cervical region. Lymph nodes are usually painless. Where caseation with liquefaction and sinus formation occurs, they may be painful.

3.2.5. Meningeal tuberculosis

Meningeal tuberculosis is usually of insidious onset with symptoms of headache, neck stiffness, indent vomiting and disordered consciousness.

3.2.6. Bone tuberculosis

Bone tuberculosis may affect any bone though it is more common in the thoracolumbar spine leading to gibbus formation due to vertebral collapse and may result in paraplegias. Osteomyelitis and cold abscess formation may also occur.

3.2.7. Gastrointestinal tuberculosis

Gastrointestinal tuberculosis may affect any part of the gastrointestinal tract, though intestinal involvement presenting as diarrhoea, malabsorption, intestinal obstruction and ascites are common.

3.2.8. Genito-urinary tuberculosis

Genito-urinary tuberculosis involving the kidneys may be asymptomatic, causing symptoms such as haematuria and sterile pyuria with extensive renal involvement. Infertility, salpingitis and tubal abscess are presentations of infection of the fallopian tubes while epididymal tuberculosis may present as painless swellings. Phylectenular conjunctivitis, iritis and choroiditis are manifestations of eye infection.

3.2.9. Dermal tuberculosis

Dermal tuberculosis may include lupus vulgaris and erythema nodusum.

3.2.10. Adrenal tuberculosis

Adrenal tuberculosis may cause Addison's disease.

Complications

Complications of pulmonary tuberculosis include pneumothorax, empyema or pyopneumothorax and laryngitis with advanced disease. Respiratory failure and right ventricular failure may develop as a late complication due to extensive pulmonary destruction and fibrosis.

Colonization of cavities with Aspergillus fumigatus may occur resulting in haemoptysis.

Constrictive pericarditis is a complication of TB. Meningeal tuberculosis as a result of TB of the spine may result in permanent neurological deficits. Gastrointestinal tuberculosis may lead to the development of ascites and malabsorption.

Diagnosis

Take good history, chest x-ray, sputum smear, ESR and Hb. Tuberculin test to make an informed decision.

Treatment

Treatment of tuberculosis should be based on the demonstration of the mycobacteria by both sputum smear histology and culture. Clinical and radiological findings of dual HIV/TB infection have changed. Identification of smear-positive cases should form the basis for treatment as these are cases responsible for continued transmission of infection. In the presence of a clinical picture, treatment may be started using standard treatment Directly Observed Therapy (DOTs). The basic principle underlying the treatment of tuberculosis is the use of multi-drug treatment regimen for a prescribed period to avoid the development of drug resistance. There is no place for the use of monotherapy in the treatment of tuberculosis nor for a trial of treatment.

Drugs

Treatment for tuberculosis is provided free of charge in all public health institutions. The basis of treatment for tuberculosis is the use of multi-drug treatment for 8 months. Directly Observed Treatment (DOTs) is the mechanism by which the supervision of each dose of the drug occurs, ideally by a member of the health care staff or by family, friends or community health workers.

Treatment is divided into an Intensive phase in which the patient should visit the clinic daily for review and medication for the first two months, followed by a continuation phase of 6 months whereby the patient visits the clinic once every 4 weeks to collect drugs.

Pyridoxine supplement of 50mg daily should be given throughout treatment and especially so in lactating and pregnant women.

Corticosteroids are indicated in meningeal and pericardial tuberculosis and should be started at the same time as antituberculosis therapy. There may be a need for pericardiocentesis in TB pericarditis.

For adults and children, treatment of tuberculosis has been classified into two categories as follows:

Adults		Paediatrics	
Category I	Category II	Category I	**Category II**
New smear positives (+) Smear negative (-) and extrapulmonary	**Smear + re-treatment cases including treatment failure, treatment after default, and relapses for smear-positive cases**	**New uncomplicated cases of TB**	**Re-treatment cases and severe, complicated TB. i.e., TB meningitis, miliary TB, spinal TB**

a) Recommended Adult Treatment Dosage

Category I: New smear-positive patients

Weight in kg	Intensive phase 2 months	Continuation Phase 6 months
	RHZE	**EH**
30-37	2	**1**
38-54	3	**2**
55-70	4	**3**
>70	**5**	**3**

R – Rifampicin, H – Isoniazid, Z – Pyrazinamide, E – Ethambutol, S – Streptomycin.

Category II: Smear positive re-treatment patients

Weight	Intensive Phase 3 months			Continuation Phase 5 months
	2 months		1 month	
	RHZE + S		RHZE	**RHE**
30-37	2	0.5g	2	**2**
38-54	3	0.75g	3	**3**
55-70	4	1.0g	4	**4**
>70	**5**	**1.0g**	**5**	**5**

Recommended Paediatric Treatment Dosage for Newly diagnosed, Uncomplicated Tuberculosis

Weight in Kg	Intensive phase 2months		Continuation phase 4 months
	RH + Z		**RH**
6 –11	1/2	1/2	**1/2**
12 – 18	1	1	**1**
19 – 26	1 1/2	1	**1 1/2**
27 – 37	2	1 1/2	**2**
> 38	**3**	**2**	**3**

Pregnancy and Breastfeeding:

The standard regimen (above) may be used during pregnancy and breastfeeding; Pyridoxine supplements are advisable. Streptomycin should not be given in pregnancy.

In exceptional circumstances, Ethambutol can be used in young children (e.g. drug resistance). However, care is needed in young children receiving this drug

because of the difficulty involved in obtaining reports of visual symptoms and in testing eyesight.

3.2.11. Multidrug-resistant Tuberculosis (MDR-TB)

Multidrug-resistant tuberculosis (MDR-TB) is a form of tuberculosis that is resistant to two or more of the primary drugs isoniazid and Rifampicin used for the treatment of tuberculosis. In Zambia, the Chest Diseases Laboratory reported Multi-drug resistant (MDR) that is resistance was 1.8% for new cases and 2.3% for previously treated cases 2003.

All suspected MDR-TB specimen should be referred to the national TB reference laboratory. MDR-TB patients should be referred for specialist treatment and where appropriate facilities for infection control exist.

Use at least four drugs with either certain or almost certain, effectiveness. Drug Susceptibility Testing (DST) should generally be used to guide therapy. Ciprofloxacin must not be used as an antituberculosis agent because of its weak efficacy compared with other fluoroquinolones. Patients should be treated for 18 months of past culture conversion. There is a role for adjunctive measures such as surgery and nutritional and social support which should be used appropriately.

Treatment involves the use of drugs from group 1 to group 4. Group 1 drugs are first-line drugs to which resistance has not been documented. Efficacy for a first-line drug should be questioned if it was used in a previously failed regimen despite a DST report to the contrary.

Group 2 drugs are the injectables either Amikacin or Kanamycin. Capreomycin may be used when there is resistance to Amikacin or Kanamycin.

Group 3 drugs include fluoroquinolones such as moxifloxacin, gatifloxacin, levofloxacin and ofloxacin.

Group 4 drugs are added based on estimated susceptibility, drug history, efficacy, side-effect profile and cost.

Ethionamide or Prothionamide is often added because of low cost; however, these drugs do have some cross-resistance with Isoniazid. Cycloserine is used often in conjunction with either Ethionamide or Prothionamide when group 4 drugs are required.

Group 5 drugs are not recommended by WHO for routine use in MDR-TB treatment because their unclear efficacy regimens are unclear in humans.

Most of these drugs are expensive, and in some cases require intravenous administration. However, they can be used in cases where adequate regimens are impossible to design with the drugs from group 1-4.

Group 5 include Clofazimine, Linezolid, Amoxicillin/clavulanate, Thioacetazone, Imipenem/cilastatin, high-dose Isoniazid, Clarithromycin.

3.2.12. Extensively Drug-Resistant Tuberculosis (XDR-TB)

Recognized earlier in 2006 in South Africa, extensively drug-resistant TB (XDR-TB) is MDR-TB that is also resistant to three or more of the six classes of second-line drugs. Currently, there is no documented evidence of XDR -TB in Zambia.

3.2.13. Tuberculosis and Immunocompromised Patients

All TB diagnosed patients should be counselled and tested for HIV. Immunocompromised patients may develop tuberculosis owing to reactivation of previously latent disease or due to new infection. Multi-resistant Mycobacterium tuberculosis may be present or the infection may be ca use d by other mycobacteria e.g. M. avium complex in which case specialist advice is needed.

Culture should always be carried out and the type of organism and its sensitivity confirmed. Minimum duration of treatment of 9 months is currently recommended for M. tuberculosis infection as re-infection is a common feature in these patients.

In TB/HIV co-infection, treat all patients for TB regardless of CD4 count. Start ART as soon as TB medications are tolerated (usually within 2 – 3 weeks). AR is not required for all patients with CD4 count >350 and no other Stage III or IV illness. Use an Efavirenz-based ART regimen. If patient has renal insufficiency ABC + 3TC + EFV is an alternative option.

In patients already on ART. Start TB treatment immediately. If on LPV/r-containing ART regimen, start Rifabutin in place of Rifampicin or add Ritonavir 300mg BD or double the dose of LPV/r. Evaluate for clinical failure and consider for second-line ART in consultation with HIV specialist.

If pregnant woman on ART, refer to the section of this guideline on HIV/AIDS Treatment or refer to HIV specialist. If on anti-TB treatment and tests positive for HIV, start ART as soon as baseline laboratories and treatment preparation completed.

Monitoring

Since Isoniazid and Rifampicin are associated with liver toxicity, the hepatic function should be checked before and during treatment with these drugs. Patients on dual treatment of HIV and TB are likely to have liver/renal toxicity and should therefore be monitored closely.

Supportive

Non-adherence is the major reason for the failure of otherwise effective drug regimens to achieve high cure rates in the management of tuberculosis. Both patient-related and service-related factors contribute to poor patient compliance. Hence, the education of both healthcare staff and patients is an important part of the management package. An adequate system of defaulter-tracing would also contribute to higher cure rates. In areas with high rates of dual HIV/TB co-infection, nutritional support and integration of Home-Based Care units and the treatment of tuberculosis is important to ensure that supervision of treatment occurs. Hospitalisation during the first two months of treatment is not routinely done and is reserved for those who are severely ill or who have complications of the disease.

Prevention

The most effective method of preventing the spread of tuberculosis is the detection and effective treatment of the infectious cases, i.e. the smear-positive cases. The effectiveness of vaccination using BCG is controversial with results of efficacy studies varying from 0% to 80%. The current WHO recommendation is that BCG should be given at birth to infants in high prevalence areas but avoided where the HIV disease is symptomatic.

Poor hygiene, malnutrition and overcrowding in places such as prisons, orphanages, boarding schools and others facilitate the spread of tuberculosis. Hence the fight against should involve the improvement of socio-economic factors. In the case of childhood TB, contact tracing of an adult should be made, as well a drug treatment.

Prophylaxis

If a child is exposed to positive pulmonary TB, particularly under 5 years of age, provide prophylactic treatment with Isoniazid 5mg/kg orally once daily for 6 months.

3.3. MENINGITIS

Description

This is inflammation of the meningeal covering of the brain or spinal cord. Both brain and meninges can be involved. This inflammation could be caused by bacteria, viral or fungal infections, malignancies, chemical reaction, intrathecal infections and also due to injury or trauma.

Clinical Features

Cli nical presentation is the same despite different causative agents; but the commonest causative agent is bacteria and these include, Gram-negative organisms i.e. E. coli in children, H. influenzae type b, group B Streptococcus, Streptococcus pneumoniae, Neisseria meningitidis and Cryptococcus in immune-compromised patients. Factors such as age, head trauma, and compromised immunity may help predict causative agents.

The relative incidence of meningitis for children remains high in the first 2 years of life. The incidence of meningitis is high during the 1st month of life with most infections being due to gram-negative organisms i.e. E-Coli in children and group B Streptococcus.

Presentation of patients with meningitis varies according to age group.

Adults and older children

- Headache
- Neck stiffness/ ache

} Common presentations

- Fever
- Vomiting
- Seizures
- Confusion
- Drowsiness
- Loss of consciousness
- Vascular collapse (Waterhouse - Friderichsen syndrome)

In infants

- Fever
- Vomiting
- Irritability
- Convulsions
- High-pitched cry and
- Bulging of the anterior fontanel is commonly present
- Stiffness of the neck may be absent
- There may be enlarging of head size

Signs of Meningitis

Other signs elicited during a physical examination that suggest meningitis include:

- Neck stiffness
- Positive kernig's sign
- Brudzinski's sign
- Cranial nerves abnormality may occur (facial nerve palsy, oculomotor nerve palsy and occasional deafness).
  Complications

These include:-

- seizures
- loss of consciousness
- hydrocephalus, thrombophlebitis
- cranial palsies
- hemiplegia and
- death.

Long term complications include mental retardation, hearing loss, sometimes blindness, epilepsy.

Diagnosis

This is confirmed by laboratory investigations. Perform a lumbar puncture for gram-stain culture and sensitivity for glucose and protein.

Cerebral spinal fluid may be cloudy, indicating bacterial meningitis.

3.3.1. Bacterial Meningitis

Initial therapy should be guided by the patient's age, the clinical circumstances, and suspected pathogen and later by the CSF results. Antibiotics are the mainstay of therapy and should be instituted parenterally at the initial stage. Benzylpenicillin or Ampicillin is given I.V.

Adults:

Benzylpenicillin 4 mega units I.M or Ampicillin 100mg - 200mg/kg I.V. 6 hourly.

The Penicillin is usually given with Chloramphenicol injection at a dosage of 50 - 100mg/kg every 6 hours.

Intravenous antibiotic injection should be put in place for the first 72 hours or for as long as the patient is unconscious and then changed to the oral form.

Treatment should generally be continued for at least 1 week after the fever subsides and the CSF returns towards normal.

The various antibiotics and combinations used in bacterial meningitis include:

In infants:

Ampicillin 100 -150mg/kg I.V (0 - 7 days old) 8- 12 hourly or 150 - 200mg/kg I.V (> 7 days old) 6 - 8 hourly plus Cefotaxime 200mg/kg I.V. every 6 hours.

Ampicillin, as above plus Gentamycin, 7.5mg/ kg I.V (0 - 7 days old) 8 hourly or 5mg/kg I.V. (> 7 days old) 12 hourly.

In children >1 month-old, Cefotaxime, as above or Ceftriaxone 20 -50mg/kg daily as a single dose can be increased up to 80mg/kg as a single dose in severe infection or Ampicillin 100 - 200mg/kg IV 6 hourly + Chloramphenicol 50 - 75mg/kg I.V. 6 hourly.

3.3.2. Fungal Meningitis

Fungal meningitis is usually caused by Cryptococcal neoformans. This is commonly seen in immunocompromised individuals such as people with HIV/AIDS or individuals with malignancies or on immunosuppressant drugs.

The drug of choice is Amphotericin-B and Fluconazole for at least 10 days and followed by daily Fluconazole.

The Amphotericin-B dosage is 0.7mg/kg IV daily by slow infusion over 4 hours. Current treatment guidelines do not support the slow dose escalation of amphotericin B and are associated with poorer patient outcomes.

Caution

Amphotericin-B the daily dosage should not exceed 1mg/ kg for adults or children.

Flucytosine is added at 150mg/kg/day every 6 hours for 6 weeks, but this is associated with increased risk of bone marrow toxicity and clinical research showed no increased benefit when compared to Amphotericin-B and Fluconazole.

Fluconazole is also effective for cryptococcus infection, but should not be used as monotherapy, particularly in the initial period of treatment.

Treatment of Cryptococcal Meningitis:

Amphotericin-B 0.7mg/kg IV + Fluconazole 800mg PO daily for at least 10-14 days, followed by daily maintenance Fluconazole 800mg for 8 – 10 weeks, then daily chronic suppression with 200mg until CD4 count >200 for at least 6 months for HIV+ patients.

Management of intracranial pressure is essential and may require repeated lumbar punctures to drain CSF to reduce the pressure. Children can be treated with 3 to 6mg/kg/ day.

Tuberculous meningitis may complicate pulmonary tuberculosis especially in patients with immunodeficiency, also in children between 1 and 5 years and in the elderly. These should be treated with anti- tuberculosis therapy, which should be prolonged for an extra 3 months.

Supportive

Fever, dehydration, and electrolyte disorders require correction.

Care must be taken not to over hydrate patients with cerebral oedema.

Convulsion and status epilepticus are treated appropriately.

All patients with presumed bacterial meningitis (of unknown aetiology) should be isolated for the first 24 hours of therapy.

Viral meningitis may complicate viral infection in other parts of the body e.g. herpes meningitis. Most common causes of viral meningitis or encephalitis are herpes viruses.

Human Herpes Virus (HHV3 or Varicella Zoster Virus): commonly causes Chickenpox or shingles. If you suspect a VZV meningitis or encephalitis:

Acyclovir IV 10mg/kg q8 hours for 14 - 21 days in adults, but can use higher doses in neonates up to 20mg/kg IV q8hrs to reduce rates of relapses. Oral Acyclovir should not be used, as therapeutic levels will not be achieved. Children 5mg/kg 8 hourly.

Prevention

- Avoid overcrowding
- Immunisation against Meningococcal Meningitis.

3.4. ANTHRAX

Description

This is a highly infectious disease of animals especially ruminants, transmitted to man by contact with the animal or animal products (carcasses) or faeces. The causative organism, Bacillus anthracis is a large gram-positive, facultatively anaerobic, encapsulated rod. The spores are resistant to destruction, remaining viable in soil and animal products for decades.

Human infection is usually through the skin but has occurred following ingestion of contaminated meat. Inhalation of spores under adverse conditions (e.g. the presence of acute respiratory infection) may result in pulmonary anthrax (wool sorter's disease) which is often fatal.

Clinical Features

The occupational history of the patient is often important. The incubation period varies from 12 hours to 5 days.

The cutaneous form: begins as a red-brown papule that enlarges with considerable peripheral erythema, vesiculation, and induration. Central ulceration follows, with serosanguineous exudation and formation of a black eschar. Local lymphadenopathy may be seen; occasionally fever, malaise, nausea, vomiting, myalgia and headache.

Pulmonary Anthrax:

This follows the rapid multiplication of spores in the mediastinal structures. Serosanguineous transudation, pulmonary oedema, and pleural effusion occur. Initial symptoms are insidious and resemble influenza. Fever increases, within a few days and severe respiratory distress, develop. Chest x-ray may show diffuse patchy infiltration; the mediastinum is widened because of enlarged haemorrhagic lymph nodes.

Treatment

Treatment is mainly by an antibiotic, penicillin is the antibiotic of choice: – Procaine penicillin-G 600, 000 unit I.M twice daily for 7 days prevents the systematic spread and induces gradual resolution of the pustule

OR

Tetracycline 2g per day in 4 divided doses for seven days

OR

Erythromycin at 500mg 6 hourly is a good alternative in children or pregnancy for seven days.

For pulmonary anthrax: Early and continuous I.V. therapy of Benzylpenicillin 20MU per day may be life-saving.

If treatment is delayed (usually because the diagnosis is missed), death is likely to occur.

Prevention

A vaccine is available for those at high risk (veterinarians, laboratory technicians, butchers and employees of textile mills processing goat hair); advocating the use of personal protective equipment, gloves, overalls, boots should be encouraged.

3.5. SEXUALLY TRANSMITTED INFECTIONS (STI)

Sexually Transmitted Infections (STIs) are among the most common causes of all Out Patient Department (OPD) attendances in Zambia.

There are three approaches to the management of STIs,

i) Aetiological: - where one collects specimens for laboratory identification of causative agent before treatment.
ii) Clinical: - where one depends on experience and own knowledge, and
iii) Syndromic: - where one identifies based on symptoms and signs and treats to cover the majority of organisms that may cause those symptoms.

The syndromic approach to managing STIs has been adopted by the Ministry of Health for the management of STIs in public health institutions in Zambia. Syndromic case management is based on identifying consistent groups of symptoms and easily recognized signs and providing treatment which will deal with the majority of organisms responsible for producing each syndrome. Using the syndromic approach, a diagnosis is made by taking a client's history and examining them to verify their STI problem.

There are 8 common syndromes namely:

- urethral discharge
- vaginal discharge
- genital ulcer
- genital growth
- lower abdominal pain
- inguinal bubo
- scrotal swelling and
- neonatal conjunctivitis.

Urethral Discharge

This is a condition in which there is dysuria coupled with often copious, mucoid discharge from the urethral meatus. Two common conditions presenting with urethral discharge are Gonococcal urethritis.

3.5.1. Gonococcal urethritis

Description

This is an acute inflammatory condition of the columnar epithelial lining of the urethra. It is caused by a gram- negative intracellular diplococcus, Neisseria gonorrhoea.

Clinical Features.

The incubation period is 3 to 5 days and the patient will present with dysuria (difficulty in micturition), followed by urethral discharge of copious, a mucoid fluid which sometimes contains puss. Frequency and urgency may develop as the disease spreads to the posterior urethra. Examination of the discharge shows a purulent, yellowish-green urethral discharge. The lips of the meatus may be red and swollen.

Complications

These include:

Acute epididymo-orchitis: This is an important complication, which is usually unilateral swelling and tenderness of the testis and epididymis. Bilateral epididymo-orchitis may result in sterility.

Urethral strictures: This is a late complication occurring in cases which are treated inadequately or not at all. This could occur 10 to 25 years after initial infection or in cases of recurrent infections.

Disseminated Gonococcal Infection: This is an arthritis-dermatitis syndrome in which the patient presents with a mild febrile illness, malaise, migratory polyarthralgia or polyarthritis) and a few pustular skin lesions.

3.5.2. Non-Gonococcal Urethritis

Description

The term Non-gonococcal urethritis is used to describe other causes., of urethritis apart from Neisseria gonorrhoeae. The organisms commonly responsible are Chlamydia trachomatis and Ureaplasma urealyticum among more than 20 known organisms.

Clinical Features

Symptoms usually occur 7 to 28 days after intercourse; usually mild dysuria and discomfort in the urethra and a clear to purulent mucoid discharge. Although the discharge may be slight and the symptoms mild, they are frequently more marked in the morning when the lips of the meatus are often stuck together with dried secretions.

On examination, the meatus may be red, with evidence of dried secretion on underwear. Occasionally the onset is more acute, with dysuria, frequency and a copious purulent discharge.

Diagnosis

This is based on bacteriological examination of the discharge to exclude gonorrhoea.

Complications

These include epididymitis and urethral stricture. Perihepatitis could also occur.

Treatment

Syndrome	Causal Pathogens	Recommended regime	Recommended regime for children
Urethral Discharge	**Neisseria Gonorrhea** **Chlamydia**	**Ciprofloxacin 500mg** **stat Plus** **Doxycycline 100 bd X 7/7**	**Spectinomycin 40mg/kg IM stat (maximum 2g stat)** **>8years old Erythromycin 50mg/kg/day in 4 doses for 14 days**

Persistent urethral discharge one week after treatment consider Trichomonas vaginalis, then treatment with Metronidazole 2g PO single dose for adults and 5mg/kg body weight for children.

Prevention

Avoiding multiple sexual partners and unprotected casual sexual intercourse. Condom use is advised.

3.5.3. Gonorrhoea in Neonates

3.5.3.1. Ophthalmia Neonatorum
Description

Ophthalmia Neonatorum is inflammation of the conjunctiva in the neonatal period (day 1 to day 28) due to infection with Neisseria gonorrhoeae. The gonococcus produces a toxin which dissolves the cornea and can lead to blindness. The infection is acquired during birth when passing through the birth canal. The incubation period is 3 to 5 days.

Non-gonococcal conjunctivitis is due to Chlamydia trachomatis, Staphylococcus aureus and Streptococcus pneumoniae.

Clinical features

It commonly presents with purulent, copious eye discharge usually in both eyes. Itching and redness are also present The neonate may also present with septicaemia with fever, rash and joint swelling.

Diagnosis

This is confirmed by taking an eye swab for culturing for Gonorrhea.

Treatment

Note: The use of antibiotic eye ointments in gonococcal conjunctivitis is of no documented benefit. Systemic treatment is recommended for all symptomatic cases

NOTE: The baby's mother and partner(s) should receive syndromic treatment for Gonorrhea and Chlamydia.

Breastfeeding mothers should be given Gentamicin and not Ciprofloxacin for gonorrhoea but for Chlamydia give Erythromycin.

Neonatal Conjunctivitis	Gonorrhoea	Spectinomycin 50mg/kg IM stat
	Plus Chlamydia	**Plus** **Erythromycin 50mg/kg PO QID X 7 days**

		Normal Saline lavage of the affected eye

Prevention

Women with pelvic inflammatory disease or urinary tract infection in pregnancy should be treated promptly before delivery. Every child's eyes should be swabbed with cotton wool soaked with Povidone-iodine or normal saline immediately after birth. Apply any of the following:

- Povidone-iodine
- Silver nitrate 1% aqueous solution stat
- Erythromycin 0.5% ophthalmic ointment stat
- Tetracycline ophthalmic ointment 1% stat
- Normal saline

Vaginal Discharge and Lower Abdominal Pain in Women

Various gynaecological conditions could present with vaginal discharge and lower abdominal pain. These include:

- Pelvic Inflammatory Disease (PID)
- Vulvovaginitis
- Urinary Tract Infection (UTI)

3.5.4. Pelvic Inflammatory Disease

Description
Pelvic inflammatory disease is a condition involving the pelvic organs i.e. cervix (cervicitis), uterus (endometritis), salpinx (salpingitis) and ovaries (oophoritis).

Organisms that may be responsible for this disease are- Neisseria gonorrhoea and Chlamydia trachomatis. Endogenous aerobic bacteria such as E. coli, Klebsiella, Proteus and Streptococcus species and endogenous anaerobes such as Bacteroides, Peptostreptococcus and Peptococcus; Mycoplasma hominis and Actinomycetes isreali affect predominantly the vagina presenting as vaginal discharge but ascend through the cervical tract to cause Pelvic Inflammatory Disease (PID). PID is a disease of the young woman.

Some of the predisposing factors are:

- Sexual intercourse
- Induced abortion

- Dilatation and curettage or endometrial biopsy
- Intra-uterine device (IUD) insertion or use
- Hysterosalpingosramy
- Laparoscopy
- Radium insertion into the endometrial cavity.

Clinical Features

Symptoms

- Lower abdominal pain
- Copious purulent vaginal discharge may be present or absent
- High-grade fever is an indicator for admission
- Nausea
- Vomiting
- Painful sexual intercourse (dyspareunia)Signs
- Occasional diarrhoea
- Lower abdominal tenderness with rebound is an indicator for admission
- Adnexia tenderness
- Cervical excitation

Complications

- Peritonitis
- Tuba-ovarian abscess
- Hydrosalpinx
- Ectopic Pregnancy
- Chronic Pelvic Pain
- Infertility
- Mortality

Indications for immediate referral to gynaecology or surgery

- missed/overdue period
- recent delivery or abortion
- abdominal guarding or rebound tenderness
- abnormal vaginal bleeding
- abdominal mass
- temperature above 38 degrees Celsius

3.5.5. Vulvovaginitis

Description

Vulvovaginitis is an inflammatory condition affecting the vulva and the vagina. The causative organisms include; Candida albicans, Chlamydia trachomatis, Trichomonas vaginalis. Bacterial vaginosis.

Clinical Features

Symptoms:

- Vaginal itching
- Burning sensation

Signs

A watery, thick or mucoid, foul-smelling and yellowish or brown vaginal discharge is sometimes present.

Diagnosis

Insert a speculum into the vagina and using a swab take two specimens one from the cervical mucosa for gram stain and culture on Gonococcal media for gonorrhoea, the second for wet mount and microscopy for Candida, Trichomonas.

Complications

- Secondary bacterial infection
- Skin excoriation
- Dermatitis

Treatment

Vaginal Discharge and lower Abdomina l Pain	**Neisseria gonorrhoeae**	**Adults: Ciprofloxacin 500mg PO stat Plus Doxycycline 100 bd PO X 7/7**	***Children: Spectinomycin 40mg/kg IM stat (maximum 2g stat)*** ***>8years old Erythromycin 50mg/kg/day in 4 doses for 14 days***
		Plus	
	Chlamydia Trichomoniasis	Metronidazole 2g PO stat	*Metronidazole 5mg/kg body weight*
		Plus	
	Bacterial Vaginosis		

Vaginal Candidiasis	**Fluconazole 150mg PO stat**

3.5.6. Urinary Tract Infection

(refer to Chapter 3.5 on STI)

Genital Ulceration

Description

Genital Ulceration is the loss of continuity in the epithelial surface covering the genital area.

Ulcerative lesions of the genitalia are common outpatient problems. Men are more commonly affected than women. There are many causes including:

- Chancroid
- Granuloma inguinale (Donovanosis)
- Herpes genitalis
- Lymphogranuloma venereum
- Syphilis

3.5.7. Syphilis

Description

This is an infection caused by spirochaetes called Treponema pallidum, a corkscrew-shaped organism with an incubation period of 9 to 90 days.

Clinical Features

Primary syphilis presents with a painless papule at the site of inoculation which then ulcerates. The ulcer called a chancre, is often solitary with a firm, indurated base and is therefore often referred to as hard sore. Oral and vulva lesions may be subtle. In men, the chancre could be found on the glans penis, shaft, anus and rectum whereas in women it is found on the vulva, cervix and perineum.

Chancres may also be found on the skin or mucous membrane of the anogenital area as well as the lips, tongue, buccal mucosa, tonsils or fingers. Rarely chancres can be found on other parts of the body, often producing such minimal symptoms that they are ignored. There may be bilateral inguinal lymphadenopathy. Without treatment, the ulcer heals in 3-6 weeks.

Secondary syphilis presents 6 to 12 weeks after infection with cutaneous rashes which may be generalized and also affect the soles and palms. The rash can mimic any skin disease ranging from circular plaques like psoriasis, or light copper coloured scaly macules like pityriasis rosea Patchy hair loss is a common presentation. In the mouth are found snail track ulcers which are slimy superficial erosions. Condylomata lata is flat warty papules and plaques found on the genitalia and perineal skin. Generalised enlarged lymph nodes may occur.

Other areas may be involved as well such as eyes (uveitis), bones (periostitis), joints, meninges, kidneys (glomerulitis), liver and spleen.

Tertiary syphilis: Presents 10 to 25 years after the initial infection. The patient may present with cardiovascular complications. These include dilated aneurysm of the ascending aorta, narrowing of the coronary aorta or aortic valvular insufficiency. The central nervous system complications include dementia and psychosis and meningovascular neurosyphilis.

Congenital syphilis presents with clinical features as those of secondary syphilis in adults. Mild constitutional symptoms of malaise, headache, anorexia, nausea, bone pain s and fatigability are present as well as fever, anaemia, jaundice, albuminuria and neck stiffness.

Diagnosis

Collect blood specimen and allow to clot, send to the laboratory for identification of antibodies to Treponema pallidum using screening methods like VDRL (Venereal Disease Research Laboratory), RPR (Rapid Plasma Reagin)

Treatment

Adult:

Benzathine Penicillin 2.4 M. U IM weekly for a total 3 doses Alternatively give Procaine Penicillin 1.2 M.U IM daily for 10 days

OR

Erythromycin 500mg 4 times a day for 14 days in penicillin allergy and children (50mg/kg body weight)

OR

In non-pregnant adults; Doxycycline 100mg twice daily for 14 days.

Child:

Benzathine Penicillin 50 000units/kg IM weekly for a total of 3 doses.

Treatment of Genital Ulcers

Most patients with primary or secondary syphilis infection have jarisch - 1-erxheimer reaction within 6 hours to 12 hours of initial treatment. The reaction is manifested by generalized malaise, fever, headache, sweating, rigours and a temporary exacerbation of syphilitic lesions. This usually subsides within 24 hours and poses no danger other than the anxiety it produces.

3.5.8. Chancroid

Description

This is an acute, localized, contagious disease characterised by painful genital ulcers and suppurative inguinal lymph nodes. The causative organism is Haemophilus ducreyi a short, slender, gram-negative bacillus with rounded ends and usually found in chains or groups.

Clinical Features

The incubation period is 3 to 7 days. Small, painful papules rapidly break down to become shallow ulcers with ragged undermined edges. The ulcers, which vary in size and often coalescing, are shallow, non-indurated, painful and surrounded by a reddish border. The inguinal lymph nodes become enlarged, tender and matted, forming a fluctuant abscess (Bubo) in the groin. The skin over the abscess becomes red and shiny and may break down to form a sinus. Chancroid may coexist with other causes of genital ulcer.

Complications

- Phimosis
- Urethral stricture
- Urethral fistula

Severe tissue destruction leading to a phagedenic ulcer which may grow rapidly and cause auto amputation of the penis. Biopsy the ulcer to distinguish from squamous cell carcinoma.

Treatment

Ciprofloxacin 500mg twice daily orally for three days.

OR

Erythromycin 500mg orally 6 hourly for 7 days

3.5.9. Lymphogranuloma Venereum

Description

This is characterized by transitory primary ulcerative lesion followed by suppurative lymphadenitis. It is caused by serotypes of *Chlamydia trachomatis* L1,

L2, L3 which are distinct from those causing trachoma, urethritis, cervicitis and inclusion conjunctivitis.

Clinical Features

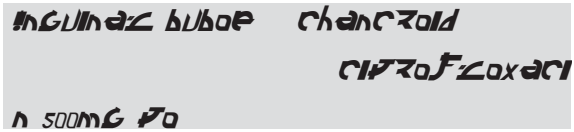
The incubation period is 3 to 12 days. A small, transient, non-indurated vesicular lesion is formed that rapidly ulcerates, heals quickly and may pass unnoticed. Usually, the first symptoms are unilateral, tender enlarged inguinal lymph nodes, enlarging above and below the inguinal ligament giving rise to the characteristic groove sign. They progress to form a large, tender fluctuant mass that adheres to the deep tissues and inflates the overlying skin. Multiple sinuses may develop and discharge purulent or bloodstained material. Healing eventually occurs with scar formation. The patient may have constitutional symptoms of fever, malaise, joint pain, anorexia, and vomiting. Backache is common in women in whom the lesion may be on the cervical or upper vagina resulting in the enlargement and suppuration of perirectal and pelvic lymph nodes. This results in the formation of rectovesical and rectovaginal fistulas. Aspirate suppurating glands with a wide bore needle through intact skin. Avoid incision and drainage through a fluctuant area which results in chronic sinus formation.

Treatment

Drugs

Doxycycline 100mg orally twice daily for 14 days or

Alternative and/or in pregnancy



Erythromycin 500mg orally 6 hourly for 14 days.

All sexual partners should be examined. The patient should be kept under observation for 6 months after apparently successful treatment.

3.5.10. Herpes Genitalis

Description

Herpes Genitalis is an infection of the genital or anogenital area by herpes simplex virus (herpesvirus hominis type 2). Type 1 (HSV-1) is the most common cause of genital ulceration in developed countries. It is moderately contagious and usually spreads by sexual contact. Lesions usually develop 4 to 7 days after sexual contact. The condition tends to recur because the virus establishes a latent infection of the sacral sensory nerve from which it reactivates and re-infects the skin.

Clinical Features

The primary lesions are more painful, prolonged and widespread than those of recurrent infections. Itching and soreness usually precede a small patch of erythema on the skin or mucous membrane. A small group of painful vesicles develops, they erode and form several superficial, circular ulcers with a red areola, which coalesce.

The ulcers become crusted after a few days and generally heal with scarring in about 10 days. The inguinal lymph nodes are usually slightly enlarged. Tender lesions in men may occur on the prepuce, glans penis, and penile shaft whereas in women may occur on the labia, clitoris, perineum, vagina and cervix. In addition to pain, in primary infection, the patient may experience generalized malaise, fever, difficulty in micturition or difficulties in walking.

Diagnosis

This is mainly clinical but can be confirmed by tissue culture.

Scrape the roof of the blister and make a smear. Stain with Papanicolaou stain. Giant multinucleated cells are diagnostic

Complications

- Aseptic meningitis
- Transverse myelitis
- Autonomic nervous dysfunction involving the sacral region leading to urinary retention.

Drugs

Acyclovir 200mg orally 5 times daily for 7 days for initial infection.

Acyclovir 200mg orally 5 times daily for 5 days for recurrent infection.

Genital Ulcer Disease	**Syphilis**	**Benzathine Penicillin 2.4MU IM weekly x 3 doses**	**Benzathine Penicillin 50 000units/ kg IM weekly x 3doses**
	Chancroid	Ciprofloxacin 500mg PO BD x days	
	Herpes Genitals	Acyclovir 400mg TDS x 7 days	**Acyclovir 20mg/kg 8 hourly for CNS and disseminated disease; extend therapy to 21days; for disease limited to the skin and mucous membranes for 14 days**
	Lympho granuloma Venerium	**Doxycycline 100 BD x 14days**	

3.5.11. Granuloma lnguinale (Donovanosis)

Rare in Zambia

Description

This is a chronic granulomatous condition usually involving the genitalia and spreads by sexual contact. It is common in the tropical and subtropical climate and is caused by gram-negative, Calymmatobacterium granulomatis and intracellular bacillus found in mononuclear cells.

Clinical Features

The initial lesion is a painless, beefy-red nodule. Multiple nodules appear and coalesce to form a large elevated, velvety, granulomatous mass. The incubation period is 1 to 12 weeks. The sites of infection in men are penis, scrotum, groin and thighs, whereas in women the vulva, vagina and perineum are the common sites, with the face being affected in both sexes. In homosexual men, the anus and buttocks are affected. There is no lymphadenopathy. The infection may involve other parts of the body. Progress is slow but the eventual lesion may cover the whole external genitalia, the deep-seated ulcers causing lymphatic obstruction and elephantiasis of the genitalia. Healing is also slow and often leads to scar tissue formation. Secondary infection is common and can cause gross tissue destruction.

Complications

- Anaemia
- Weight loss

Diagnosis

Do a punch biopsy of the lesion and crush between two glass slides. Stain with Wright's or Giemsa Stain to show gram-negative rods within macrophages. Secondly, send the biopsy for histopathology to rule out squamous cell carcinoma. Thirdly, diagnosis can be based on clinical findings that are often characteristic i.e. bright, beefy- red granulomatous lesions.

Treatment

Drugs

- Erythromycin 500mg orally 6 hourly for 14 to 21 days.

Prevention:

- Condom use is advisable

3.5.12. Genital Growth (Condylomata Acuminata)

Description

This is a fleshy growth found around the anogenital region caused by Human papillomavirus infection HPV6 and 11 but HPV 16 and 18 are associated with cancer of the cervix.

Clinical Features

Lesions can be subclinical (not visible to the naked eye) or overt anogenital warts.

Visual inspection of overt disease (fleshy growth of the lower genital tract) detects obvious lesions, which are often multifocal in distribution. However, the appearance and size depending on their location, the trauma to which they are subjected and the degree of irritation.

Genital growths	*Genital warts (Condylomata Acuminata)* *Benzathine Penicillin 2.4 MU IM weekly for 3 doses* *Condylomata lata*	*Podophyllin 25% topically by physician weekly till resolved*	*Cauterisation* *(i) 0 5 – fluorouracil cream* *(ii)Trichloroacetic acid* *(iii)Cryosurgery* *(iv) Electro cauterisation* *(v) Laser vapourisation* *(vi) Surgical removal* *Benzathine Penicillin 50 000iu/kg IM weekly for 3 doses*

For Cervical Warts DO NOT CAUTERISE

Diagnosis

This is based on direct inspection. If uncertain, confirmation can be done by biopsy. May predispose to cancer of the cervix.

Treatment

Podophyllin paint compound (Podophyllin resin 15% in compound Benzoin tincture) – applied every week until lesions disappear. The application should not be left on for more than 4 hours. Where possible, the application should be done in the clinic.

OR

Silver nitrate crystals 5% daily until lesions disappear. Recurrence is common.

Prevention

Avoid multiple sexual partners.

Condom use is advised.

Special consideration pertaining to syndromic management.

Pregnant women

- Vaginal discharge syndrome: for Neisseria gonorrhoeae give Spectinomycin 2g IM stat; for Chlamydia give Erythromycin 500mg QID for 5-7 days
- Genital Ulcer Disease: for Chancroid give Erythromycin 500mg QID X 7 days; for LGV give Erythromycin 500mg QID for 7 days; for Herpes Genitalis give Acyclovir as in the non-pregnant. In the event of an outbreak during labour, consult a gynaecologist to consider an emergency Caesarian Section; for Donovanosis give Erythromycin 500mg QID for 3 weeks until all lesions have completely healed.
- Genital Growths: Genital warts, LEAVE ALONE, wait until delivery, then decide on surgical management. During labour, if the pelvic outlet is obstructed, or vaginal delivery would result in excessive bleeding, Caesarian Section is indicated. For cervical warts, refer to a gynaecologist for a pap smear to rule out CIN, because cauterization can lead to vaginal fistulas or perforation. For anal warts, refer to a surgeon because cauterization could lead to fistula formation. For urethral-meatal warts, refer to a surgeon
- HIV Infected
  Genital Ulcer Disease: in Chancroid, since the ulcers heal slower, it is recommended that the courses of treatment take longer, give Erythromycin 500mg QID for 5 - 7 days.
  Children

For children treated with Erythromycin, follow up for symptoms of pyloric stenosis which present with vomiting and abdominal discomfort/distention.

3.5.13. Hepatitis

Description:

Acute inflammation of the liver caused by primarily human viruses from A to E; B and C.

Mode of transmission

- Cutaneous, or
- Mucous membrane exposed to contaminated blood
- Unprotected sex by an infected partner, or through
- Contaminated needle by injection, and
- Perinatal transmission.

The clinical features of acute hepatitis are common to all of them and these are:

- Malaise
- Nausea
- Abdominal pain
- Anorexia
- Jaundice
- Dark urine
- Fever
- Rash
- Arthralgia

	Hepatitis B	Hepatitis C
Incubation	60 – 180 days	**15 – 180 days**
Transmission	Blood borne Sexual	**Blood borne Sexual**
Progression to chronicity	Occasionally varies by age	**Usually**
Etiologic agent	Hepatitis B Virus	**Hepatitis C Virus**
Comments	Vaccine available	**Not available**
Serologic diagnosis	**HBsAg, IgM anti-HBc**	**HCV RNA; anti H**

Treatment

Counsel patient for HIV AIDS and if negative give Lamivudine 150mg twice a day.

If positive refer to ART Clinic.

Prevention

- Hepatitis B vaccine is available for children, but no vaccine for Hepatitis C
- Safe sex
- Avoid the use of contaminated needles.

3.5.14. Acute Epididymo-orchitis

Description

This is an inflammation of the epididymis and the testes. It is usually a complication of urethritis which is not treated at all or which was improperly treated.

Clinical Features

Presentation is mucoid, puss-filled urethral discharge, painful scrotal swelling usually unilateral but could be bilateral, the pain is gradual and dull. Milking of the urethra produces puss-filled discharge. Diagnosis is confirmed by culture of urethral discharge. Complications include atrophy of the testes, infertility.

Supportive

- Bed rest,
- Scrotal support or elevation,
- Scrotal ice packs,
- Analgesia

The causative organism in men less than 35 years of age is usually *Neisseria gonorrhoeae* or *Chlamydia trachomatis*.

Treatment

Drugs

The best antibiotics are those that are sensitive to the above organisms.

Ciprofloxacin 500mg stat oral + Doxycycline 100 mg OD for 7 days.

OR

Ceftriaxone 1g (I.M.) once + Doxycycline 100mg 12 hourly for 7 days.

Erythromycin may be substituted for Tetracycline or Doxycycline at 500mg every 6 hours for 7 days.

In men older than 35 years of age, the cause is mostly due to coliform gram-negative bacilli. Gentamicin 80mg 8 hourly for 7 days or a 3rd generation cephalosporine as above may be used until the sensitivity is determined.

Prevention

- Avoiding multiple sexual partners
- Usage of condoms.

3.5.15. Urinary Tract Infection

Description

This is an infection, often bacterial, of the ureters, bladder and urethra. Urinary tract infection occurs much more frequently in women than in men, especially in pregnancy.

Most urinary tract infections are commonly caused by gram-negative bacteria, including E. coli, Klebsiella species, and Proteus species. Less commonly caused by gram-positive cocci such as Staphylococcus species (especially non-coagulase Staphylococcus, and Enterococci.

Clinical Features

In general, symptomatic urinary tract infections are characterised by irritative symptoms of the urinary bladder i.e.

- Frequency,
- Urgency and
- Dysuria (pain on passing urine).

Urinary tract infections may also be asymptomatic and diagnosis is coincidental on testing the urine and possibly culture of the urine.

Predisposing factors to urinary tract infections include catheterisation, colposcopy, cystoscopy and following intravenous urogram (I.V.U).

Complications

These include:

- Chronic pyelonephritis
- Prostatitis in men
- Acute epididymo orchitis

Diagnosis

This is made by history, physical examination and laboratory investigations. Midstream specimen (MSSU) urine is collected for microscopy, culture and sensitivity. The diagnosis is based on colon count of bacteria of more than 10/5/ml on culture.

Treatment

This should be instituted based on the common cause of UTI. Treatment should be reviewed as soon as the sensitivity results are ready.

Drugs

Based on sensitivity:

Nitrofurantoin 50 - 100mg 12 hourly for 5 to 7 days

OR

Nalidixic Acid 250mg 8 hourly for 5 days

If there are complications these drugs are used for at least 14 days or more.

Refer repeated infections to a higher level.

Supportive

Increase water intake, prophylactic antibiotic therapy for those who have multiple repeated urinary tract infection or those who have a congenital abnormality of the urinary tract predisposing them to multiple repeated infections before surgical correction of such abnormality.

3.5.16. Acute Pyelonephritis

Description
This is a bacterial infection of the kidney and renal pelvis, often bilateral. Escherichia coli is the commonest bacteria isolated, others include Klebsiella sp, Proteus mirabilis, Enterobacter, also Enterococcus and Staphylococcus aureus.

Clinical Features
Pyelonephritis is especially common in girls or pregnant women and after bladder catheterization or instrumentation. It is not common in men who are free from urinary tract abnormalities.

Typically, the onset is rapid and characterised by chills, fever, loin pains, nausea, and vomiting. Symptoms of lower urinary tract infection, including frequency, dysuria occur concomitantly in a third of patients. Physical examination reviews some abdominal rigidity especially in the loin of the infected side. In children, symptoms often are slight and less characteristic.

Diagnosis
Diagnosis is made by urinalysis, microscopy, culture and sensitivity. On urinalysis, the pH may be alkaline because of the urea-splitting organism, proteinuria is minimal. White blood cells (WBC) greater than 10/ ml are usually found in fresh uncentrifuged urine, and haematuria is common. Culture usually shows greater than 7 04 colony forming units (CFU)/ ML. On microscopy, presence of microscopic casts, WBC greater than 70/ml are usually found per High Power Field (HPF).

Complications
These include chronic pyelonephritis, chronic renal failure.

Treatment

Initial treatment can be oral for those less ill but will be parenteral for most patients. After 24 to 48 hours without fever, most patients receiving I.V therapy can be switched to oral regimes.

In uncomplicated cases a single agent may be used:

- Amoxycillin tablets 250mg - 500mg 8 hourly for Adults
- Ciprofloxacin tablet 500mg - 1gm 12 hourly Adult for 14 days.
- Cefotaxime 1g 12 hourly for 14 days

- Ceftriaxone I.V. 1gm once daily for 14 days
- Most treatments are used for 2 weeks, but up to 6 weeks may be required to prevent relapse.

3.6. THE PLAGUE

Description

This is an acute, severe infection appearing in, bubonic, septicemic or pneumonic form, but pharyngeal and meningeal could also be found. This is caused by a bacteria called Yersinia pestis; a short bacillus that often shows bipolar staining (especially with Giemsa stain). Plague often occurs primarily in rodents e.g. rats. Plague is transmitted from rodent to man by the bite of an infected flea vector. Man to man infection occurs through inhalation of droplets in pneumonic plague. Septicaemia and meningeal plague are due to haematological spread.

Clinical Features

Symptoms

- Headache
- Severe malaise
- Vomiting
- Chills
- Muscle pain
- Cough
- Abdominal pain
- Chest pains

3.6.1. Bubonic Plague

This is the commonest form. The incubation period varies from a few hours to 12 days but is usually 2 to 5 days. Onset is abrupt often associated with chills, fever, rapid pulse with low blood pressure (hypotension) may occur. Enlarged lymph nodes (buboes) appear very shortly before the fever. The femoral and inguinal lymph nodes are most commonly involved; followed by axillary cervical or multiple nodes. Typically, the nodes are extremely tender and firm, surrounded by considerable oedema. The liver and the spleen may be palpable. The mortality rate of the untreated patient is about 60%.

3.6.2.Primary Pneumonic Plague

This has 2 to 3 days incubation period, followed by abrupt onset of high fever, chills, tachycardia and headache, often severe. Cough is not prominent initially. Cough develops within 20 to 24 hours with the sputum, mucoid at first, and rapidly becomes bloody.

Chest X-ray shows progressive pneumonia. Most untreated patients die within 48 hours of the onset of symptoms.

Diagnosis is based on the recovery of the organisms which may be isolated from blood, sputum or lymph node aspirate. Needle aspiration of bubo is preferable since surgical drainage may disseminate infection. Inject sterile Phosphate buffered saline in the bubo and aspirate the pus.

Treatment

Drugs

Uncomplicated plague

Treatment in Adults

- Streptomycin 15mg/kg 12 hourly for 10 days or Gentamicin 5mg/kg IM or IV qid or Doxycycline 100mg po bid or Chlorampenicol 25mg/kg IV qid
- Tetracycline 250mg -1g orally 6 hourly for 7 to 10 days or
- Chloramphenicol 25mg/kg I.V or orally 6 hourly for 7 to 19 days.

Treatment in pregnancy

- Gentamycin 5mg/kg IM
- Doxycycline 100mg PO bid

Treatment in children

- Streptomycin 15mg/kg IM BID
- Gentamycin 2.5mg/kg IM
- Doxycycline 2.2mg/kg IV BID
- Chlorampenicol 25mg/kg IV QID

Prevention

This is based on rodent control and the use of repellent to minimize fleabites. Through immunization with standard killed plague vaccine gives protection to at-risk individuals e.g. veterinary doctors.

3.7. HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS)

Description

HIV: Human Immunodeficiency Virus. This is the virus that causes HIV infection and AIDS.

AIDS: Acquired Immune Deficiency Syndrome AIDS is the severest stage of the clinical spectrum of HIV infection. It occurs when the immune system of a person who is HIV- infected becomes so suppressed that they are vulnerable to opportunistic infection and neoplasms.

ART: Antiretroviral Therapy. A combination of antiretroviral drugs used in the management of HIV/AIDS

Clinical Features

The WHO clinical staging is used to determine the severity of HIV infection based on the presenting opportunistic infections in a confirmed HIV infected individual. WHO staging can be used to make decisions for switching or stopping ART.

WHO Clinical Staging of HIV disease in Adults and Adolescents

CLINICAL STAGE 1

- Asymptomatic
- Persistent generalized lymphadenopathy

CLINICAL STAGE 2

- Moderate unexplained weight loss (under 100/o of presumed or measured body weight)

  Unexplained refers to where the condition is not explained by other conditions e.g. nutrition or exercise regime intended to lose weight.

  Assessment of body weight among pregnant women needs to consider the expected weight gain of pregnancy.
- Recurrent upper respiratory tract infections (sinusitis, tonsillitis, otitis media, pharyngitis)
- Herpes zoster in the last 5 years
- Angular cheilitis
- Recurrent oralulceration
- Papular pruritic eruptions
- Seborrhoeic dermatitis

- Fungal nail infections

CLINICAL STAGE 3

- Unexplained severe weight loss (over 100/o of presumed or measured body weight) Assessment of body weight among pregnant women needs to consider the expected weight gain of pregnancy.
- Unexplained chronic diarrhoea for long er than one month
- Unexplained persistent fever (intermittent or constant for longer than one month)
- Persistent oral candidiasis
- Oral hairy leukoplakia
- Pulmonary tuberculosis
- Severe bacterial infections (e.g. pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, bacteraemia)
- Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis
- Unexplained anaemia (below 8 g/dl), neutropenia (below 0.5 x 10^9/ I) and/or chronic thrombocytopenia (below 50 x 10^9 / l**)**

CLINICAL STAGE 4

- HIV wasting syndrome (>10% weight loss and > 1-month diarrhoea and > 1-month fever)
- *Pneumocystis* pneumonia
- Recurrent severe bacterial pneumonia
- Chronic herpes simplex infection (orolabial, genital or anorectal of more than one month's duration or visceral at any site)
- Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs)
- Extrapulmonary tuberculosis
- Kaposi sarcoma
- Cytomegalovirus infection (retinitis or infection of other organs)
- Central nervous system toxoplasmosis
- HIV encephalopathy
- Extrapulmonary cryptococcosis including meningitis
- Disseminated nontuberculous mycobacterial infection
- Progressive multifocal leukoencephalopathy
- Chronic cryptosporidiosis
- Chronic isosporiasis
- Disseminated mycosis (extrapulmonary histoplasmosis, coccidiomycosis)
- Recurrent septicaemia (including non-typhoidal Salmonella)
- Lymphoma (cerebral or B-cell non-Hodgkin)
- Invasive cervical carcinoma
- Atypical disseminated leishmaniasis

- Symptomatic HIV-associated nephropathy or HIV- associated cardiomyopathy

***Note:** This is based on the 2020 Zambia Consolidated HIV Guidelines. HIV treatment may be revised or changed as the disease evolves or new evidence-based national recommendations are released**.**

Diagnosis

- Early Diagnosis (DNA- PCR)
- HIV Self-Testing (HIV-ST)
  HIV-ST is a process in which a person collects their oral fluid or blood and then performs an HIV rapid test and interprets the result. An HIV self-test is a screening test which requires further testing and confirmation for any reactive result. Health care providers should ensure that users receive clear information on:
    (i) How to perform the test and interpret the result correctly
    (ii) Where to access HTS and further support services
    (iii) How to safely dispose of the used test-kits
    (iv) The ethical and legal obligations (no one should test a third party without their consent)
- Universal Routine HIV Testing gives an opportunity to provide immediate treatment and care to all HIV infected individuals through the "test and treat" strategy without using CD4 as eligibility criteria for HIV treatment.

- Health care workers are therefore mandated to offer routine HIV testing to all individuals presenting to health facilities (in the inpatient department, routine testing should be extended to the caregivers).
- Rapid antibody detention
  i. Screening test - Determine test
  ii. Confirmation test - Unigold test
  iii. Tiebreaker test – Bioline test.
- For children <24 months old who are breastfeeding, the mother should be tested first. If she is HIV-positive, perform a Nucleic Acid Test (NAT) which can be done using either a **Dried Blood Spot- DBS (by being sent to a central testing lab) or a Point-of-care machine (POC)** on the HIV-exposed infant (HEI), regardless of age. Infants who have HIV detectable by NAT at birth are likely infected in utero, will progress to disease rapidly, and, in the absence of treatment, will experience high mortality in the first few months of life. Infants infected at or around delivery may not have virus detectable by NAT for several days to weeks. The ability of NAT to detect the virus in the blood may be affected by ARV drugs taken by the mother or infant for postnatal prophylaxis, resulting in false-negative results. This includes drugs present in breast milk as a result of maternal ART during breastfeeding.
- The rationale behind this recommendation is that infants who are first identified as HIV-exposed postpartum have a high cumulative risk of already having acquired HIV by the time prophylaxis is initiated; thus NAT should be performed around the time of initiating prophylaxis,

which would be at birth. This will help to minimize the risk of development of resistance because of extended prophylaxis in infected infants and help to promote linkage to timely initiation of cART.

Clinical Management

Full History
History of the presenting complaint
ICF for TB (Cough, Fever, Weight loss and night sweats HIV history
HIV Risk factors
Past medical history Social history
Drug history
Reproductive history
Full Physical Exam

Baseline Laboratory investigations

- FBC (Hb, Hct), CD4, ALT, Creatinine (CrCl)
- CD4 count, HBsAg (if not vaccinated), Pregnancy test (Adolescent or woman of reproductive age), Syphilis test (adolescent or adult), Cholesterol and triglycerides (if starting on a PI)
- HPV test or visual inspection with acetic acid (sexually active adolescent or woman)
- BP, BMI, RBS & Urinalysis

Eligibility Criteria for initiating ART

Prior to initiating ART in all patients ensure that:

1. HIV positive test confirmed and post-test counselling done
2. Documented treatment preparation is completed
3. Disclosure is documented
4. Minimum baseline laboratories are completed: CD4, ALT, Creatinine, Hct/Hgb, etc.
5. Absence of the danger signs of unresolved Opportunistic Infections (Ols) listed belowis documented
   a. Persistent fever
   b. Persistent cough
   c. Severe persistent headache
   d. Anaemia (Hgb <8 or Hct <24)
   e. Weight loss >10%

If ANY of the above five symptoms are PRESENT then investigate and treat as appropriate (see the review of undiagnosed Ols on next page)

6. Initiate diagnosis with sputum for AFB, CXR, cryptococcal antigen, and

oxygen saturation

7. Based on test results initiate appropriate therapy
8. Initiate ART two weeks after documented response to OI treatment
9. If no clear diagnosis obvious from a diagnostic test, then consult an HIV Specialist before initiating ART.

Zambian recommendations for initiating antiretroviral therapy in adults and adolescents with documented HIV infection is "TREAT ALL" irrespective of CD4 count or WHO staging.

Conditions to initiate ART irrespective of CD4 count

Condition	Recommendation
HIV positive partner in Discordant Couple (see below) Hepatitis B Virus Infection (chronic hepatitis B)*	Treat all irrespective of CD4 count

*Patients testing HBsAg positive with CD4 counts greater than 350 cells/mm3 should have ALT or AST checked and if elevated initiate ART. For patients with normal baseline ALT or AST recheck ALT or AST and HBsAg in 6-12 months.

*If ALT or AST are elevated, or persistent HBsAg then start ART regardless of CD4 count or WHO stage. If signs of liver cirrhosis are positive HBsAg start HAART regardless of ALT or AST values.

For patients eligible for ART provide the following risk reduction:

- Finish reduction
- Treat presenting problem
- Identify latent opportunistic infections e.g. screen for TB
- Provide Cotrimoxazole prophylaxis 960mg tablet daily (800mg Sulphadoxine + 160mg Trimethoprim)
- Provide close follow up of patient on ART in the first 2 weeks, after one month and every 3-months
- Conduct laboratory investigations.

3.7.1. Pre-Exposure Prophylaxis (PrEP)

Pre-exposure prophylaxis, or PrEP, is when people at high risk for HIV take HIV medicines daily to lower chances of getting infected.

PrEP involves the use of antiretroviral (ARV) drugs before HIV exposure by people who are not infected with HIV to block the acquisition of HIV. WHO recommends oral PrEP containing Tenofovir (TDF) with either Emtricitabine (FTC) or Lamivudine (3TC) to be offered as an additional prevention choice for

people at substantial risk of HIV infection as part of combination HIV prevention approaches.

Considerations for PrEP

- The combination of TDF+XTC (Emtricitabine or Lamivudine) is active against Hepatitis B infection thus discontinuation of TDF+XTC requires close monitoring in those infected with Hepatitis B due to the concern for rebound viremia.
- Persons with osteopenia/osteomalacia/osteoporosis may be at risk of bone loss associated with TDF.
- PrEP efficacy has not yet been established in pregnancy and breastfeeding, therefore its use in this population is NOT recommended.
- TDF should not be co-administered with other nephrotoxic drugs, e.g. aminoglycosides.
- Standard TB medication does not interact with PrEP drugs and there is no need for dose adjustments.
- Clients on MDR-TB medications may have increased risk of renal side effects. PrEP should therefore be avoided.
- Other prevention methods should be recommended and PrEP screening should be delayed until the end of MDR-treatment.
- Standard hormonal contraception does not affect PrEP effectiveness, nor does PrEP affect contraceptive effectiveness.
- PrEP clients must be routinely tested for HIV infection, and cART offered immediately if the PrEP user seroconverts.
- PrEP is not 100% effective at preventing HIV and clients need to be counselled that they should use other prevention methods as well.

Eligibility Criteria

- No suspicion of acute HIV infection
- Test HIV negative at a health facility
- Interested in PrEP and willing to be adherent
- Able to attend regular 3-month reviews and HIV testing
- Able to concomitantly apply other prevention methods such as barriers to prevent the transmission of other STIs
- Willing to stop taking PrEP when no longer eligible.

And: at substantial risk for HIV infection, defined as engaging in one or more of the following activities within the last six months:

- Vaginal/anal intercourse without condoms with more than one partner
- Sexually active with a partner who is known to be HIV positive or at substantial risk of being HIV positive
- Sexually active with an HIV-positive partner who is not on effective treatment (defined as on cART for > 6 months and virally suppressed)
- History of STI
- History of PEP use
- Sharing injection material or equipment

PrEP may also be considered for key populations (as defined by the 2017 NASF) or by persons self-selected as high-risk for HIV acquisition. Such persons should meet the eligibility criteria above.

Recommendations

- PrEP should be taken for a minimum of 7 days in men, 21 days in women to achieve maximal protection from HIV acquisition before engaging in high-risk sexual exposure and must be continued as long as risky exposure persists or one remains negative HIV testing is required before PrEP is offered
- Repeat HIV testing every 3 months is mandatory while a client is on PrEP
- The frequent HIV testing during PrEP use should also ideally become an opportunity for STI screening and management.
- Those who seroconvert while on PrEP should be immediately switched to a standard first-line regimen
- PrEP should be provided as part of the combination prevention package (condom use, HTS, family planning, STI screening, etc.)

Lab Tests before PrEP

- HIV test (only HIV-negative partners should be on PrEP)
- Creatinine (or urinalysis if creatinine not available)
- ALT
- RPR/RST
- Repeat HIV testing is recommended while PrEP is taken every three months
- Hepatitis B (those with positive results should be on lifelong TDF+XTC to treat HBV)

ARV regimen to be used for oral PrEP

- Tenofovir Disoproxil Fumarate in combination with Emtricitabine (TDF+FTC) is preferred for PrEP.
- However, if Emtricitabine is not available, Lamivudine in combination with Tenofovir (TDF+3TC) may be used for PrEP.

Lab Monitoring while on PrEP

- Creatinine at 1 month, 2 months, every 3 months for the first 12 months then annually thereafter
- ALT every 3 months for the first 12 months then annually thereafter
- Repeat HIV testing is recommended while PrEP is taken at one month and every 3 months
- Necessary lab tests as per indication
- Pregnancy test (especially if the PrEP regimen is TAF-based).

Adherence Support on PrEP

- Support for adherence should include information that PrEP is highly effective when used with strict adherence.

- PrEP users should be advised that PrEP only becomes effective after 7 days (21 days in women) and must be continued as long as risky exposure persists or one remains negative.
- Brief client-centred counselling that links daily medication use with a daily habit (such as waking up, going to sleep, or a regular meal) may be helpful.
- Special programmes to facilitate adherence among particular groups—such as young people and women—may be needed.
- Support groups for PrEP users, including social media groups (e.g. https://www.facebook.com/groups/PrEPFacts), maybe helpful for peer-to-peer sharing of experience and challenges.
- People who start PrEP may report side effects in the first few weeks of use. These side effects include nausea, abdominal cramping, or headache, are typically mild and self-limited, and do not require discontinuation of PrEP.People starting PrEP who are advised of this start-up syndrome may be more adherent.

When to Stop PrEP

- PrEP can be discontinued if a person taking PrEP is no longer at risk and when this situation is likely to be sustained (i.e., no longer engaging in any high-risk behaviours as defined above).
- PrEP can be discontinued after 4 weeks of elimination of the risk exposure.
- Significant side effects or if the creatinine clearance decreases to <50mL/min.
- If in a serodiscordant relationship, the HIV positive partner has been on ART for more than 6 months, is known to be virally suppressed, and there are no other partners, then the HIV negative partner on PrEP may discontinue therapy. However, for pregnant or breastfeeding women, PrEP should be continued.

Note: For Step-by-Step guide to PrEP use, refer to the 2020 Zambia Consolidated HIV Treatment Guidelines.

PrEP considerations for Pregnant and Breastfeeding Women

Pregnant and breastfeeding women, often remain at substantial and increased risk of HIV acquisition during pregnancy and breastfeeding.

There is no safety-related rationale for disallowing or discontinuing PrEP use during pregnancy and breastfeeding for HIV-negative women who are receiving PrEP and remain at risk of HIV acquisition. The guidelines conclude that in such situations the benefits of preventing HIV acquisition in the mother, and the accompanying reduced risk of mother-to-child HIV transmission outweigh any potential risks of PrEP, including any risks of fetal and infant exposure to TDF and XTC in PrEP regimens. Active toxicity surveillance for ARV use during pregnancy and breastfeeding is highly recommended.

Although there is limited experience with the use of PrEP in antenatal and postnatal care services, it is an important new HIV prevention method.

Indications for PrEP in Pregnant and Breastfeeding Women

1. A woman taking PrEP who subsequently becomes pregnant and remains at substantial risk of HIV infection
2. A pregnant or breastfeeding HIV-negative woman who is or perceives herself to be at substantial risk of HIV acquisition
3. A pregnant or breastfeeding HIV-negative woman whose partner is HIV-positive
4. An HIV- negative woman who is trying to conceive if her partner is HIV-positive.

In such cases, PrEP combined with screening for acute infection, adherence counselling, safety monitoring and HIV retesting every three months, in addition to other existing HIV prevention options, including condoms, should be offered.

PrEP Regimen in Pregnant and Breastfeeding Women

TDF + XTC in combination with other ARVs for HIV treatment.

TAF + FTC can be used in patients with CrCl between 30 and 50mL/min, though TAF is not currently recommended for use in patients with TB or pregnancy.

Note:

- PrEP should be provided as part of a comprehensive package: PrEP is part of a package of combination HIV prevention and other services that include HIV testing services, assisted partner notification, provision of male and female condoms and lubricants, contraception choices and screening and treatment of STIs.
- A woman's risk may vary over time as circumstances change. Women should be supported to start and to stop PrEP if their HIV risk changes. The risk for HIV acquisition is not constant.
- PrEP can be used with hormonal contraception. Recommended PrEP regimens do not appear to alter the effectiveness of hormonal contraception.
- PrEP is not for everyone: It is a choice, and women should be making an informed decision based on their risk for HIV. All women should be counselled on the range of HIV prevention modalities that they can choose from to minimize the risk of HIV acquisition during pregnancy.
- Active surveillance of pregnant and breastfeeding women receiving PrEP is needed to identify and record adverse pregnancy and infant outcomes. Clients on PrEP need to be followed up at the clinic for routine monitoring.

3.7.2. Post-Exposure Prophylaxis of HIV (PEP)

Post-exposure prophylaxis is the use of cART to prevent HIV transmission. Non-occupational exposure to HIV in children is mostly due to sexual abuse. In adults, exposure to HIV is mostly associated with occupational injuries. The risk of acquiring HIV infection after occupational exposure to HIV-infected blood is low (1:300 after percutaneous exposure to <1:1000 after mucocutaneous exposure).

There is no risk of transmission when the skin is intact. Factors associated with an increased risk include deep injury, visible blood on the device that caused the injury, injury with a large-bore needle from artery or vein, and unsuppressed HIV

viral load in source patient. Body fluids and materials that pose a risk of HIV transmission are amniotic fluid, cerebrospinal fluid, human breast milk, pericardial fluid, peritoneal fluid, pleural fluid, saliva in association with dentistry, synovial fluid, unfixed human tissues and organs, vaginal secretions, semen, any other visibly blood-stained fluid, and fluid from burns or skin lesions. Other blood-borne infections are hepatitis B and hepatitis C viruses. Thus all HCWs should receive HBV vaccination.

Management of occupational exposure to infectious substances includes the following steps:

Immediately after exposure:

- Clean the site: wash skin wounds with soap and running water. DO NOT squeeze, allow the wound to freely bleed. If the exposed area is an eye or mucous membrane, flush with copious amounts of clean water. DO NOT USE BLEACH or other caustic agents/disinfectants to clean the skin.
- Contact your In-Charge or Supervisor.
- Consult the clinical officer or medical officer, who does the following: Determine the need for post-exposure prophylaxis (PEP) based on the risk of transmission and risks and benefits of taking (or not taking) cART.

PEP Recommendations based on the risk category

Risk category	*cART*	*Duration*
No risk: intact skin	*Not recommended*	
Medium risk: invasive injury, no blood visible on needle	*Preferred:* • *TDF or TAF + XTC + DTG*	*28 days*
High risk: large volume of blood/fluid, known HIV-infected patient, large-bore needle, deep extensive injury	*Alternatives:* • *TDF or TAF + XTC + DRV-r;* • *TDF or TAF + XTC + LPV-r;* • *TDF or TAF + XTC + ATV-r;* • *AZT + 3TC + LPV-r (children < 20kg)* • *AZT + 3TC + DTG (children ≥ 20kg)* • *TAF + FTC + DTG (children ≥ 25kg)*	
Penetrative sexual abuse		

For patients with CrCl <50mL/min, replace TDF with AZT
****DTG is effective against both HIV 1 and 2 and prevents integration of the viral DNA into the host DNA. It should be avoided in pregnancy and for HIV/TB patients on Rifampicin, the dose of DTG should be 50mg twice daily instead of the regular 50mg once daily. For intolerance toDTG (such, insomnia, anxiety, depression), use a recommended PI***
***** For patients who intolerant to ATV-r or if the source is HIV-2 infected and cannot tolerate DTG, LPV-r should be used.***

Clients on PEP should have an HIV test before starting PEP, and a repeated test at 6 weeks and 3 months, consecutively. While on PEP, the client should be reviewed and offered appropriate laboratory investigations.

3.7.3. Non-Occupational Post-Exposure Prophylaxis (nPEP)

This is the provision of ARVs to individuals with significant exposure to HIV within 72 hours. This should be given especially to individuals who have been sexually assaulted where the HIV status of the assailant is unknown or in any other circumstance where there is significant exposure to HIV contaminated body fluid.

Clients who come for nPEP should be evaluated for substantial risk behaviour for HIV acquisition. Those with substantial risk or repeated requests for nPEP must be counselled for PrEP.

The ARV regimen for nPEP are the same as those for PEP due to occupational exposure as shown above.

Considerations before starting ARV therapy:

- Effectiveness of regimen.
- Potential for serious adverse effects and toxicity. Side effects and tolerability.
- Potential for interactions with other drugs.
- Potential for treatment options should the initial drug combination fail.
- Cost and availability.
- Patient readiness and the likelihood of adequate adherence.
- Presence of pregnancy or the risk of becoming pregnant.
- Presence of tuberculosis and other illnesses -anaemia, peripheral neuropathy, kidney disease, hepatitis.
- Abilityy of the patient to return for regular and reliable follow-up

Recommended Antiretroviral Regimens

The following are the recommended 1st line and alternative ART regimens by specific populations:

Recommended ART regimens by specific populations (1st line and alternative regimens)

Population	Description	Preferred 1st line ART	Alternative regimen(s)
Pregnant & Breastfeeding women	*All*	*TDF + XTC + DTG*	*TDF + XTC + EFV400 or ABC + 3TC + DTG**
Children (0-2 weeks)	*All*	*AZT + 3TC + NVP***	*AZT + 3TC + RAL*
Children (2 weeks to < 5 years old)	*<20 Kg*	*ABC + 3TC + LPV-r*	*AZT + 3TC + LPV-r* *AZT + 3TC + RAL*
	20 – 24.9 Kg	*ABC + 3TC + DTG*	*AZT + 3TC + LPV-r* *ABC + 3TC + LPV-r*
	≥ 25 Kg	*TAF + 3TC + DTG*	*ABC + 3TC + DTG*
	≥ 30Kg	*TAF + 3TC + DTG*	*TDF + 3TC + DTG*
Children co-infected with TB	*<20 kg*	*ABC + 3TC + RAL (Double dose of RAL) or ABC + 3TC + AZT*	*AZT + 3TC + EFV (> 3 months)*
	20 – 29.9 kg	*ABC + 3TC + DTG* *Increase the frequency of DTG to 50mg twice daily*	*ABC+3TC+LPV-r* *(LPV-r should be super boosted, otherwise consult expert opinion)* *ABC + 3TC + EFV* *ABC + 3TC + RAL*
	≥ 30Kg	*TDF + 3TC+DTG* *Increase the frequency of DTG to 50mg twice daily*	
Adolescents (10 to <19 years old) weighing ≥ 30Kg	*All*	*TDF (or TAF[c]) + XTC[d] + DTG[e]*	*TDF (or TAF[c]) + XTC[d] + EFV400[a] or* *ABC + 3TC + DTG**
Adults			

[a] EFV 400 is the lower dose of EFV-400mg/day and is the preferred ARV agent in HIV/TB patients on TB treatment
[b] If NVP exposure, the alternative regimen is a PI-based therapy
[c] TAF is Tenofovir alafenamide. Avoid in pregnancy and HIV/TB patients on Rifampicin (currently not recommended)
[d] Can either be 3TC or FTC
FTC is not available as a single drug and is expected to be part of the fixed-dose combination TAF+FTC+DTG
[e] DTG (Dolutegravir) to be given to ART naïve adolescents and adults. For HIV/TB patients on Rifampicin and cannot tolerate EFV400, increase the frequency of DTG to 50mg twice daily instead of the usual 50mg once daily where a single tablet is available
**** ABC+3TC+DTG can be used as an alternative for those with renal insufficiency, or where TAF is not available and EFV is not tolerated***
***** Use of NVP is only for prophylaxis in infants and treatment for up to 2 weeks of age in absence of Raltegravir (RAL)***

3.7.4. HIV-2 Treatment

Clinicians should:

- Use the preferred standard First-Line regimen TDF (or TAF) + XTC + DTG If unable to tolerate DTG, substitute with a Lopinavir-ritonavir when prescribing ART for HIV-2 mono-infected or HIV-1/ HIV-2 co-infected individuals.
- Not prescribe NNRTIs (NVP, EFV or RPV) or the PI Atazanavir-ritonavir as part of an ART regimen against HIV-2 mono-infection.
- Consult with a provider with the ATCs in the management of HIV-2 where there are doubts before initiating ART in HIV-2-infected patients.
- Educate patients with confirmed HIV-2 infection about the types of drugs that can be used to treat it.

Although HIV-2 is generally less aggressive, and progression to AIDS is less frequent, HIV-2 responds less predictably to ART when progression occurs, and response is more difficult to monitor. The standard methods and interpretation protocols that are used to monitor ART for HIV-1 infected patients may not apply for HIV-2-infected patients. Some ART regimens that are appropriate for HIV-1 infection may not be as effective for HIV-2. The following factors should be considered:

- The majority of HIV-2 infected patients are long-term non-progressors.
- HIV-2 may confer more rapid resistance to ART agents because of wild-type genetic sequence that results in a significant increase in resistance to ART agents compared with HIV-1.
- Pathways for the development of drug mutations may differ between HIV-1 and HIV-2.

Preferred 1st line and alternative ART regimens for HIV-2

Specific population	*Description*	*Preferred 1st line regimen*	*Alternative regimen(s)*
HIV-1/HIV-2 co-infected	*Adolescents and adults*	*TDF (or TAF[a]) + XTC + DTG[b]*	*TDF or TAF + XTC + LPV-r[d] (or DRV-r) or ABC + 3TC + LPV-r or (DRV-r) ABC + 3TC +DTG[f]*
HIV-1/HIV-2 co-infected	*Children*	*ABC + 3TC + LPV-r*	

a. TAF should also be avoided in pregnancy and HIV/TB patients on Rifampicin
b. DTG is active against HIV-1 and 2.
d. LVP-r is the only PI that actively works against HIV-2
e. For the alternative regimen for children, refer for consultation or call the Toll-Free line 7040.
f. ABC + 3TC + DTG could be used as an alternative for those with renal insufficiency or where TAF is not available and LPV-r is not tolerated.
† Positive Health Dignity and Prevention (PHDP) includes: risk reduction, ART adherence, correct condom use, family planning, STI screening, and partner HIV testing

Follow-up clinical and laboratory monitoring for HIV patients on ART

Timeline	*Clinical task*	*Laboratory tests*
Enrollment and ART initiation	- *History and examination* - *Screen for TB, Cryptococcus* - *Adherence counselling* - *PHDP† messages* - *Initiate ART after adherence counselling* - *If no signs and symptoms of active TB disease, initiate IPT (i.e. after ruling out TB)*	- *Serum creatinine* - *ALT* - *Hb or FBC* - *Blood glucose* - *CD4 count* - *CrAg Tests for those with CD4 cell count <100 cells/microL or WHO Stage III/IV* - *Urine-LAM CrAg Tests for those with CD4 count <100 cells/microL or WHO Stage III/IV* - *HBsAg* - *Syphilis test* - *Urinalysis for protein and glucose, RBCs* - *Cholesterol, and triglycerides (especially if starting PI)*
Week 2 post-initiation	- *Targeted history & examination* - *Screen for TB, Cryptococcus* - *Review adherence, side effects, toxicity* - *Review laboratory tests* - *Adherence counselling*	- *Serum creatinine (if on TDF)* - *Urinalysis (if on TDF)*
Week 4 post-initiation	- *Targeted history & examination* - *Screen for TB, Cryptococcus* - *Review adherence, side effects, toxicity* - *Review laboratory tests* - *Adherence counselling*	- *Serum creatinine (if on TDF)* - *Urinalysis (if on TDF)*
Week 12 post-initiation	- *Review adherence, side effects, toxicity* - *Adherence counselling* - *PHDP† messages* - *Review laboratory tests* - *Refill ART with enough supply to next visit (max. 3 months supply).*	- *Serum creatinine (if on TDF)* - *Urinalysis (if on TDF)*
6 months post-initiation	- *Review adherence, side effects, toxicity* - *Adherence counselling* - *PHDP† messages* - *Review laboratory tests* - *Refill ART with enough supply to next visit (max. 3 months supply unless transferred to appropriate DSD models).*	- *Serum creatinine (if on TDF)* - *Urinalysis (if on TDF)* - *Viral load* - *CD4 cell count* - *Cholesterol and triglycerides (if on PI)*

12 months post-initiation and every 12 months	- *Review adherence, side effects, toxicity* - *Adherence counselling* - *PHDP† messages* - *Review laboratory tests* - *Refill ART with enough supply to next visit (max. 3 months supply unless transferred to appropriate DSD models).*	- *Serum creatinine (if on TDF)* - *Urinalysis (if on TDF)* - *Viral load* - *CD4 cell count* - *Cholesterol and triglycerides (if on PI)*
Those with CD4 cell count >350 cell/microL at baseline and 6 months of ART with. Suppressed viral load should NOT have subsequent repeat CD4 cell count monitoring as long as the viral load remain suppressed		

Clinical and laboratory monitoring for HIV-infected pregnant and breastfeeding women

Timeline	*Clinical tasks*	*Laboratory tests*
Day 0: Enrollment & ART initiation	- *History and examination* - *If pregnant, focussed ANC (FANC)* - *Screen for TB, Cryptococcus* - *Adherence counselling* - *PHDP† messages* - *Initiate ART after adherence counselling* - *If no signs and symptoms of active TB disease, initiate IPT (i.e. after ruling out TB)*	- *Serum creatinine* - *ALT* - *Hb or FBC* - *CD4 count* - *HBsAg* - *Syphilis test* - *Viral load testing at first contact if eligible for those on ART* - *Urinalysis* - *Cholesterol and triglycerides (especially if on PI)*
Week 2 post-initiation	- *Targeted history & examination*	- *Serum creatinine* - *Urinalysis*
Week 4 post-initiation	- *Screen for TB, Cryptococcus, and other OIs*	- *As needed*
Subsequent visits to occur per: - ***ANC if pregnant*** - ***HEI schedule if postnatal and breastfeeding*** - ***Adult ART schedule if postnatal and not breastfeeding***	- *If pregnant, ANC* - *Review adherence, side effects, toxicity* - *Adherence counselling* - *PHDP messages* - *Review laboratory tests* - *Refill ART with enough supply to next visit (max. 3 months supply).*	- *Viral load to be done every 3 months during pregnancy and breastfeeding period* - *Serum creatinine and urinalysis at every ANC visit* - *Laboratory testing to occur per ANC while pregnant except for viral load* - *VL within 4 weeks before labour & delivery* - *Cholesterol and triglycerides to be done at 6 months post- ART initiation during pregnancy* - *Follow adult ART schedule when postnatal except for viral load*
First postnatal visit	*CD4 cell count to determine the need for continuation of Co-trimoxazole*	
24 months after delivery	- *ART dispensed in MNCH until transferred* - *Transfer to ART clinic for the continuum of HIV care and treatment*	

	- *Earlier transfer or referral may be done for logistical reasons or complicated cases*

† Positive Health Dignity and Prevention (PHDP) includes: risk reduction, ART adherence, correct condom use, family planning, STI screening, and partner HIV testing

Monitoring Side Effects and Toxicities on ART

Changing an ARV drug should be done only after careful review of adherence. The indication for changing needs to be addressed. A specific ARV drug may be changed (substitution) because of:

- Toxicity, such as anaemia, peripheral neuropathy, lipodystrophy, liver or renal abnormalities
- Intolerance or unresolved and prolonged side effects
- Poor adherence: change indicated only to simplify dosing schedule and to improve adherence
- Occurrence of active TB (refer to the section on TB-HIV co-infection)
- Failure (clinical, immunologic, or virological)

When HIV patients are switched to alternative regimen the goals are to achieve HIV viral suppression, avoid adverse events, and optimize adherence. Always do viral load and ensure that the patient is suppressed before switching across cases.

Treatment Failure

Clinical
Treatment failure should be considered when clinical symptoms appear whilst on therapy that is suggestive of deteriorating status.

Immunological
Treatment failure is indicated by a drop of CD4 values to below pre-treatment levels or 50% from the peak value on treatment or persistent CD4 levels below 50 cells/ mm3 after 12 months on therapy.

Note:
Patients initiating at very low CD4 may not be able to mount an adequate CD4 recovery; in this case, viral load is indicated.

Virologic
Wherever facilities are available to test for viral load, the following may suggest failure:

- Plasma HIV viral load >400 copies/ml after 6 months on therapy.

Note:
Blips (single level of 50-1000 c/ml are not considered as failure, repeat viral load as

soon as possible.

And patients who appear to be failing on treatment while the viral load is undetectable should be considered to have undiagnosed opportunistic infections or other concomitant illness.

It should not be concluded, based on clinical criteria, that an ARV regimen is failing until there has been a reasonable trial of first-line therapy lasting at least six months, adherence has been assessed and optimized, intercurrent opportunistic infections have been treated and resolved, and IRIS has been excluded. Clinical events that occur before the first six months of therapy are excluded from this definition of failure because they often represent immune reconstitution inflammatory syndromes related to pre-existing conditions.

Factors leading to treatment failure

- Poor adherence to treatment
- Prior exposure to antiretroviral treatment with the development of resistance
- Primary viral resistance (infected with resistant HIV strain)
- Inadequate drug absorption
- Suboptimal dosing (e.g. sharing dose because of side effects)
- Inadequate or inconsistent drug therapy
- Drug interactions.

Management of Treatment Failure

Patients on ART who have a viral load >1000 copies/mL are failing the treatment and at risk of progression of the HIV disease. Poor adherence is the commonest cause of treatment failure. Adherence barriers must be evaluated and corrected before the therapy is changed.

Patients failing treatment are prone to opportunistic infections and a comprehensive evaluation of the opportunistic infections, especially Tuberculosis, must be done before therapy is changed.

When patients are switched to Second-Line ART regimens, the goals are to achieve HIV viral suppression resulting in reconstitution of the clinical and immunologic status, avoid adverse events, and optimize adherence. LPV-r is the primary recommended Second-Line PI.

Specific populations	*Failing 1st line ART*	*2nd line ART*
Children <5 years old	*ABC + 3TC + LPV-r*	*AZT + 3TC + RAL*
Children 5-10 years old	*ABC + 3TC + EFV*	*AZT + 3TC + LPV-r*
Adolescents and Adults	*TDF + XTC + DTG** *TAF + XTC + DTG** *ABC + 3TC + DTG** *TDF + XTC + EFV** *ABC + 3TC + EFV***	*AZT + 3TC + LPV-r (or ATV-r)*
Pregnant & Breastfeeding Women	*TDF + XTC + EFV*** *ABC + 3TC + EFV***	*AZT + 3TC + LPV-r (or ATV-r)*
**** Represents newer regimens*** *****Represents older regimens***		

Summary of preferred 2nd line ART regimens

Specific population	*Preferred 2nd line ART regimen*	
Adults and adolescents	*If AZT was used in 1st line ART*	*TDF + XTC + LPV-r (or ATV-r)*
	If TDF or TAF was used in first-line ART	*AZT + 3TC + LPV-r (or ATV-r)*
Pregnant and breastfeeding women	*Same regimens as recommended for adults and adolescents if no previous NVP exposure without tail coverage.*	
HIV & TB co-infection	*On Rifampicin-based TB treatment: If AZT +3TC + EFV was used in the first-line ART*	*TDF (or TAF) + XTC+ DTG (50mg twice daily)* *If DTG not available:* *Double dose LPV-r (LPV-r-800mg/200mg twice daily)*
	On Rifampicin-based TB treatment: If TDF (or ABC) + XTC + EFV was used in first-line ART	*AZT + 3TC + DTG (50mg twice daily)* *If DTG is not available:* *Double dose LPV-r (LPV-r-800mg/200mg twice daily)*
	If Rifabutin available use same PI regimens as recommended for adults and adolescents	
HIV & HBV co-infection	*AZT + TDF + XTC* + LPV-r (or ATV-r)* ** TDF+XTC should always be part of the combination in HBV/HIV co-infections*	
HIV-1/HIV-2 co-infected	*TDF + XTC + DTG*	*AZT + 3TC + LPV-r[a]*
HIV-2 mono-infected	*ABC + 3TC + DTG*	*AZT + 3TC + LPV-r[a]*
[a] DO NOT substitute with Atazanavir in HIV-1/HIV-2 con-infection or HIV-2 mono-infection. Atazanavir is not active against HIV-2		

3.7.5. Elimination of Mother-to-Child HIV Transmission (EMTCT)

Description

Prevention of infant acquisition of HIV infection from their mothers during labour and delivery or after birth through breast-feeding.

The table below depicts interventions to reduce the risk of MTCT and mitigate against infection.

Risk factors and mitigating intervention

Risk factor	Prevention/mitigating intervention
High viral load	Antiretroviral therapy in pregnancy
Low CD4 count	As above + PCP prophylaxis
Advanced Diseases (AIDS)	ART. PCP and TB prophylaxis OI treatment
Chorioamnionitis	Identify & treat STI and malaria
Malaria	Provide malaria prophylaxis during pregnancy, IPT & ITNs
Low Vit. A	Maternal Vit. A supplementation does not reduce MTCT
Pre-maturity	Comprehensive antenatal care, identify at-risk mothers, provide PCP prophylaxis
Prolonged rupture of Membranes	Comprehensive ANC, safer delivery practices and modified obstetric care
Invasive delivery procedures	Discourage scalp vein monitoring, vacuum extraction, episiotomies and nasal suction
Cracked nipples	Counselling on optimal breastfeeding practices & breast care
Breast-feeding	Counselling on infant feeding options: EBF, early and rapid cessation, replacement feeding etc

Refer to Section 5.7.4 for eMTCT Guidelines.

3.7.6. Non-Mother-to-Child (horizontal) Transmission

Description

HIV horizontal Transmission of HIV to children and adolescents through,

- Sexual transmission i.e. Rape

Defilement,
High-risk survival sex,
Married adolescents, (Mentally, psychologically, physically immature).

- Use of contaminated needles
- Other skin-piercing instruments
- Exposure to infected body fluids and transfusion with contaminated blood and blood products.

The disease status of the rapist or defiler i.e. viral load, the presence of STIs is an important factor. Any rapist should be assumed as HIV positive unless proven otherwise.

Management of the sexually assaulted child

- Admit the child where possible
- Take history to establish circumstances leading to the sexual assault
- Examine the child under anaesthesia if possible or sedation to determine the extent of the injury and whether the assault is acute or habitual
  Ideally, it should be done by a female health worker.

In the presence of the mother or caregiver

- Collect blood for HIV test, HBV, and syphilis screening and plan to repeat them at 6 weeks, 3 months and 6 months after the assault.
- Collect specimen of genital secretions to be examined for sperm and seminal fluid
- Take swabs for bacterial STI.

3.7.7. Post-Exposure Prophylaxis for Sexually Assaulted Child

Initiate post-exposure prophylaxis (PEP) after rape or sodomy as soon as possible because it is most effective if begun within 24 hours of the assault and is probably ineffective after 72 hours. Also, consider prophylaxis in other situations, such as exposure to contaminated medical equipment, blood, or other bodily fluids and after human bites with disruption to the skin.

- Prior to offering PEP
  Do a rapid HIV test & start PEP only if negative
  If positive offer emotional support and supportive counselling, assess for ART eligibility and provide comprehensive care.

Empirically treat for bacterial STI and vaccinate against HBV

- Offer emergency contraception to adolescents if they have evidence of sexual maturation.
- Offer trauma counselling to the child and caregivers
- Alert authority as appropriate
- Refer as appropriate to legal services
- Keep good record keeping in view that sexual assault is a criminal offence.

3.7.8. Management of Patients Previously on ART

Individuals who interrupt ART for any reason are at increased risk of resistance and treatment failure. Management in ART re-initiation is based on several factors, and a complete history to establish why the treatment was stopped is critical. For HIV-infected children, caregivers must be questioned.

- If treatment failure or toxicity is not suspected as the reason for stopping ART, and previous good adherence is reported, reinitiate original ART in consultation with next level.
- If previous adherence is poor and there is treatment failure, these individuals (and caregivers of children) MUST be enrolled in intensive adherence counselling sessions until there is agreement among the patient, provider, and adherence counsellor that the patient is ready to commence Second-Line ART. Use of treatment supporters for such patients is strongly recommended.
- If severe toxicity is the reason for stopping ART, refer to the next level and initiate ART using the appropriate drug substitution and counsel regarding adherence.
- Viral load testing should be done 6 months after re-initiation of the original regimen to document HIV viral suppression.
- Do not collect viral load tests for patients who present to care while not taking ART

3.7.9. Management of Pregnant and Breastfeeding Women defaulters or Failing Therapy

- Due to the risk of the transmission of HIV to the unborn or breastfeeding infant, pregnant or breastfeeding women who present to

care with unsuppressed viral load or who have defaulted treatment must be switched to effective therapy (second-line if they previously took a first-line or third-line if they previously took second-line) immediately while the EAC is in process. DTG-based regimens are recommended in this situation.

When to stop ART

Patients may choose to postpone or stop therapy, and providers, on a case-by-case basis, may elect to defer or stop therapy based on clinical and/or psychosocial factors.

The following are indications for stopping ART:

- Patient's inability to tolerate all available ARV medications
- Patient's request to stop after appropriate counselling
- Non-adherence despite repeated counselling: treatment should be stopped to avoid continued toxicity, continued evolution of drug resistance, and transmitting drug-resistant HIV
- Unreliable caregiver
- For children, the caregiver is instrumental in ART adherence. Any factors that affect the capability for the caregiver to give medications consistently may be an indication to stop ART in an HIV-infected child.
- Serious drug toxicity or interactions
- Intervening illness or surgery that precludes oral intake
- ARV non-availability

How to stop ART

- Stop ALL the drugs when discontinuing therapy
- Discontinue EFV; continue the NRTI components (backbone) for 1-2 additional weeks
- Preventive measures, such as condom use and safer sex practices, should be strongly emphasized for all patients, especially those discontinuing treatment.

3.7.10. Treatment Failure with No Further Treatment Options

Continue the failing ART regimen unless there are intolerable toxicities or drug interactions. Even with treatment failure, the regimen is likely to have some residual antiviral activity. Stopping therapy in the setting of virological failure can be associated with rapid falls in CD4 counts and development of OIs.

When to Consult or Refer to the Next Level of Care

The following criteria are indications to consult or refer to the next level:

- Suspected hepatotoxicity not responding to standard management (e.g. TB/HIV co-infection treatment, ALT/AST >5-fold of the upper limit of normal)
- Second-Line treatment failure or inability to tolerate Second-Line therapy
- Complications on PI-based regimen
- Severe or life-threatening adverse reactions
- Inability to tolerate therapy despite the change in regimen
- HIV-HBV co-infection with renal insufficiency

Third-Line ART: Second-Line Treatment Failure

Treatment failure is defined by a persistently detectable viral load >1,000 copies/mL. For adolescents and adults, failure is two consecutive viral load measurements within a three-month interval, with adherence support between measurements after at least six months of using triple combination ARV drugs. For children, viral load may still be detectable at 6-9 months after initiation and does not necessarily mean treatment failure. Viral blips or intermittent low-level viremia (20–1,000 copies/mL) can occur during effective treatment but have not been associated with an increased risk of treatment failure unless low-level viremia is sustained. A repeat blip should be assessed further at the ATC. Additionally, clinical and epidemiological studies show that the risk of HIV transmission and disease progression is very low when the viral load is lower than 1,000 copies/mL

Provision of third-line ART occurs in very rare circumstances and is beyond the scope of most ART providers. All patients being considered for third-line ART should have:

- Confirmed Second-Line ART failure (defined by a persistently detectable viral load exceeding 1,000 copies/mL [i.e., two consecutive viral load measurements within a three-month interval with enhanced adherence support between measurements] after at least six months of using Second-Line ART)
- Genotype (resistance) testing (Figure 17) to an HIV Specialist at an Advanced Treatment Centre (ATC) with a complete ART treatment history (i.e., all previous ARV drugs that the patient has taken with the duration of use)
- Before starting the third line, establish the reason for treatment failure (e.g., poor adherence, suboptimal dosing, drug-drug interactions) and conduct intensive adherence counselling sessions until there is an agreement between the patient, provider, and adherence counsellor that the patient is ready to commence third-line ART
- Use of treatment supporters for such patients is STRONGLY recommended

- The most likely ARVs to be successful in patients who have followed National Guidelines are Dolutegravir or Raltegravir (Integrase inhibitor) or Darunavir with ritonavir (Protease inhibitor) plus optimal nucleoside background (e.g. TDF+XTC or AZT+3TC)

Other considerations with major constraints:

- Etravirine: especially if the genotype is available at time of 1st line NNRTI failure, although in some patients NNRTI mutations persist even after non-exposure to NNRTIs in Second-Line
- Maraviroc: needs special tropism test before initiation, which is currently not available in Zambia.

Before switching therapy in suspected treatment failure, HCWs need to rule out:

- Poor adherence: change therapy only after enhanced adherence counselling has been conducted
- Immune Reconstitution Inflammatory Syndrome (IRIS): treat the underlying condition and continue ART if tolerated
- Untreated OIs: treat the underlying condition and continue ART if tolerated
- Pharmacokinetics (e.g. Rifampicin reduces NVP or LPV-r blood levels): switch to EFV or double the dose of LPV-r or switch Rifampicin to Rifabutin.

Current infections causing a transient decrease in CD4 count: treat infection, and if possible, repeat CD4 one month after the resolution of illness to confirm immunologic failure.

Reason for failure	Action	What to do
Poor compliance within 8-16 weeks of therapy	Review the reasons for poor compliance and counsel accordingly.	**Continue with the same combination or simplify dosing.**
Poor compliance > 16 weeks of therapy	Consider changing therapy. Review the reasons for poor compliance.	**Change two drugs.**
Treatment failure	Change therapy.	**Use drugs not used in the previous regimen preferably new classes.**

Adverse drug reaction	Check drug-drug interactions. Stop the drugs if continuation is of no benefit to the patient.	**Change the offending drug.**
Depression	**Psychosocial support**	**Refer to appropriate care provider**

3.7.11. Immune Reconstitution Inflammatory Syndrome (IRIS) and HIV

Immune reconstitution inflammatory syndrome (IRIS) is an exaggerated inflammatory reaction from a re-invigorated immune system presenting as the unmasking of previously sub-clinical opportunistic infections OR clinical deterioration of pre-existing opportunistic infections OR development of the autoimmune disease.

- Onset: usually within 2-12 weeks after starting ART
- Frequency: 10% among all patients on ART, up to 25% when ART initiated with CD4 < 50 cells/μL

Risk factors:

- Initiating ART close to a diagnosis of an opportunistic infection
- Initiating ART when CD4 is less than 50 cells/μL
- Rapid initial fall in HIV-1 RNA level in response to ART in patients with low CD4 counts
- Commonly seen with TB, cryptococcal disease, Kaposi's sarcoma, and Mycobacterium avium complex infection
- Patients initiated on DTG and with low CD4 counts have a higher risk of having IRIS

Management of IRIS

- Have a high index of suspicion with early complications
- ART should be continued
- If ART continuation is impossible, temporarily interrupt the ART and restart the same regimen after OI or IRIS is addressed
- Diagnose and treat OI or inflammatory condition
- Corticosteroid treatment in moderate to severe cases: Prednisolone 0.5-1.0mg/kg/day for 5-10 days.

4. DISEASES AND CONDITIONS AFFECTING ENDOCRINE SYSTEM

4.1. DIABETES MELLITUS

Description

Diabetes is a metabolic condition characterized by chronic hyperglycaemia resulting from the disordered metabolism of fat, protein and carbohydrates.

Classification of Diabetes mellitus

Diabetes can be classified into four general categories:

1. Type 1 diabetes mellitus (due to autoimmune pancreatic beta-cell destruction)
2. Type 2 diabetes mellitus (due to a progressive loss of pancreatic b-cell insulin secretion frequently on the background of insulin resistance)
3. Gestational diabetes mellitus (GDM) (diabetes diagnosed in the second or third trimester of pregnancy and resolves after child delivery)
4. Specific types of diabetes due to other causes, such as:

- Monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young [MODY])
- Diseases of the exocrine pancreas, e.g., cystic fibrosis and pancreatitis.
  Drug or chemical induced diabetes, e.g., glucocorticoid use, in the treatment of HIV/AIDS, or after organ transplantation (post-transplantation diabetes mellitus).

Epidemiology of Diabetes Mellitus

- Type 1 and type 2 diabetes mellitus occur in both children and adults. Type 2 diabetes (T2DM) is the most prevalent form of diabetes worldwide, affecting more than 400 million people around the world.

  Diagnosis

  The classic symptoms of diabetes are a fasting plasma glucose of >7mmol/L or random plasma glucose of >11.1 mmol/L is adequate.

  The test must be repeated on at least one other occasion. This is a blood sample from venous blood

  Note: Urine glucose can only be used as a preliminary screening tool in the absence of blood glucose. The patient should be sent to a level where blood glucose can be done.

  If only a glucometer is available, then the fasting capillary glucose level used is > 6.1mmol/L, but the random capillary glucose remains at > 11.1 mmol/L.

Note: Casual or random is defined as any time of the day without regard to time since last meal. Fasting is defined as no caloric intake for at least 8 hours.

Diabetes mellitus should be investigated using fasting plasma glucose (FPG) or haemoglobin A1c (HbA1c), which unlike the oral glucose tolerance test (OGTT) do not require any special patient preparation. Fasting for FPG testing is defined as not having any meal overnight for at least 8 hours. Repeat FPG or HbA1c testing is advisable to confirm the diagnosis. An OGTT can be carried out if FPG and HbA1c are inconclusive.

4.1.1. Type 1 Diabetes mellitus

Description

This was also previously referred to as Insulin Dependent Diabetes Mellitus (IDDM). It usually occurs in children and young adults. Occasionally, it can be found in adults.

Clinical features

The rate of type diabetes progression is dependent on the age at the first detection of antibody, number of antibodies, antibody specificity, and antibody titre.

Type 1 diabetes patients often present in an acute state.

Clinical characteristics at diagnosis

Symptoms

- Blurred vision
- Frequent urination (polyuria)
- Increased thirst (polydipsia)
- Increased hunger (polyphagia)
- Weight loss but can be normal/underweight
- Tiredness/weakness

Signs

- Weight loss
- Dehydration

Laboratory findings
- Elevated blood glucose
- Ketoacidosis

Treatment
All newly diagnosed patients need to be referred for initiation of treatment and stabilisation.
Drugs
Soluble insulin on its own or mixed with isophane insulin (0.6 - 1.5 units/kg) subcutaneously over 24 hours in 2 or 3 divided doses per day. Adjust the dose to keep the blood sugar levels between 6 - 8 mmol/L.

Dietary control
- Avoid sugar and sugar-containing foods and drinks.
- Take meals regularly.
- Consult nutritionist or dietician on diet modification.

Supportive
Monitor the following:
- Blood pressure
- Renal function
- Blood glucose
- Hydration
- Serum electrolytes and minerals
- Urine sugar
- Urine ketones

Treat infections if any.
Teach the patient and carers about the disease and its management.
Encourage regular exercise
Regular review of the patient at a specialist clinic/hospital

4.1.2. Type 2 Diabetes Mellitus (T2DM)

Description
This was also previously known as Non-Insulin Dependent Diabetes Mellitus (NIDDM). It usually occurs in older people and its onset is insidious.

Clinical features
These may be mild and may not cause the patient to seek medical attention. This condition is often discovered when a complication arises. There is usually a delay of many months or years from onset to diagnosis.

The following are the common features:

Symptoms
- Obesity
- Blurred vision
- Frequent urination/polyuria
- Bedwetting
- Increased thirst/polydipsia
- Weight loss
- Infarct/angina
- Stroke
- Susceptibility to infections e.g. genital tract/urinary tract infections (vulva itching in women)
- Claudication
- Paraesthesia/pain
- Foot ulcer

Signs
- Dehydration
- Weight loss

Investigation findings
- Elevated blood glucose
- Blood lipid abnormalities

Treatment
Diet and Exercise
Diet and exercise are the mainstays in the treatment of T2DM. This should be tried first in all patients except those with very high glucose levels and those who are severely symptomatic. Those who fail to respond to diet and exercise can then move on to taking drugs.

Medication therapy
The two main classes of drugs used in Zambia are sulphonylureas and biguanides.

Sulphonylureas
- Glibenclamide: Initially can be given orally once a day or in two divided doses. The usual dose is 5mg orally daily taken before breakfast up to a maximum of 20mg in divided doses before food, depending on the

patient's response. Doses above 20mg will not result in any improvement in glucose control.

- Glipizide; adults initially 2.5 – 5mg daily adjusted according to response, dose to be taken shortly after breakfast or lunch. Doses up to 15mg may be given as a single dose, higher doses to be given in divided doses, maximum 20mg per day.
- Sulphonylureas can be given together with biguanides.

Biguanides

Metformin is the preferred drug in obese patients in addition to dietary control and exercise. It may also be added in patients who have reached the maximum dose of a sulphonylurea without achieving adequate control of blood sugar levels.

- Metformin 500mg orally 2-3 times daily or 850mg orally 2-3 daily with or after food. The maximum dose is 2.55g daily in divided doses.

NOTE:
Dosage increments in oral antidiabetic drugs should be gradual i.e. at 1 to 2-week intervals.

Insulin

Insulin may be used alone or added on if the combination of sulphonylurea and biguanide fails to achieve adequate control of blood sugar.

Insulin is available in two types of preparations:

i) Short duration, soluble forms, for rapid onset of action
ii) Intermediate duration

Most patients are best started on intermediate action insulin twice daily and a short-acting form may be added to control any hyperglycaemia which may follow breakfast, lunch or supper.

It is important to note that variability in absorption within the same individual and between two individuals can happen.

Insulin doses should be calculated and determined on an individual patient basis, gradually increasing the dosage until the patient stabilises. Care should be taken not to cause hypoglycaemia.

If diabetes control is poor on diet, exercise and oral drugs, do not delay starting insulin.

Withdrawal of oral (sulphonylureas & biguanides) drugs should be commenced only after the insulin therapy has been initiated. In some patients, metformin and insulin combination can be given.

Supportive

- Monitor blood glucose levels regularly
- Prescribe appropriate diet
- Careful weight reduction in obese patients
- Encourage regular exercise
- Regular review of the patient at a specialist clinic/hospital
- Educate patient and carers

Patient and carers education

Patients and carers should be educated on the following:

- Identification of symptoms of hypoglycaemia
- Principles of foot care
- Injection techniques and how to look after syringes and insulin
- Types of insulin preparations available
- Monitoring blood glucose or urine glucose
- Diet control i.e. meal intervals depending on the type of insulin.

Note:
Weight reduction for obese patients and appropriate diet is key in the process of managing diabetes mellitus.
Dietary control and exercise should be continued alongside drug therapy.

4.1.3. Hyperglycaemic/Ketoacidosis Coma/Precoma

Description

Severe uncontrolled diabetes with very high blood sugar requiring emergency treatment with insulin and intravenous fluids and with a blood ketone body concentration of greater than 5mol/L, the common precipitating causes are infection, management errors and new cases of diabetes, but there is no obvious cause in about 40% of episodes.

In Africa, DKA carries high mortality – through delayed diagnosis, inadequate treatment and late presentation. It presents at any age although there is a well-defined peak at puberty.

Clinical features of diabetic ketoacidosis

- Polyuria, nocturia, thirst
- Weight loss
- Weakness
- Visual disturbance
- Abdominal pain
- Leg cramps
- Confusion, drowsiness, coma
- Dehydration
- Hypotension
- Tachycardia
- Rapid and deep respiration (Kussmaul breathing)
- "Acetone" odour
- hypothermia

Management
Children
Establish and maintain cardiovascular and renal functions.
Correct fluid and electrolyte deficiencies and imbalances. Give insulin to reduce blood sugar.

Determine the precipitating causes of the crises.
Look out for and prevent any complications.
Fluid and electrolyte replacement:
i.- Sodium chloride 0.9%, rapid infusion 20ml/kg in the first one hour then assess urine output. When blood sugar falls to between 10 – 16 mmol/L, change to dextrose 5% to prevent hypoglycaemia. ii.- If the potassium level is low or normal, add potassium intravenously 20 – 40 mmol/L of intravenous fluid. This should be given after insulin therapy has been commenced.

Insulin
Soluble insulin 0.1 units/kg/hour, given intravenously, as a continuous infusion. When blood sugar levels reach 10 mmol/L reduce to 0.05 units/kg/hour.
Once the patient has stabilised, manage as for Type 1 diabetes mellitus

Adults
Conduct assessments and investigations as in children Fluid and electrolyte replacement:
i.- Isotonic (normal) saline (sodium Chloride 0.9%) rapid infusion 1 – 2L in the first one hour then reassess

and repeat as needed. Normally 6-8 litres in the first 24 hours. When blood sugar falls to between below 14 mmol/L change to dextrose 5% to prevent hypoglycaemia. If sodium level more than 150 mmol/L give half strength (hypotonic) saline.

ii., Sodium bicarbonate (600ml of 1.4%, or 100ml of 8.4% in a large cannulated vein) if pH>7.0

iii.,Potassium ,

1.,Add dosage below to each 1L of infused fluid: ,,

(a) If plasma K<3.5mmol/L, add 40 mmol KCI ,,

(b) If plasma K 3.5-5, 5mmol/L, add 20mmol KCI

Insulin

i. Soluble insulin 5-10 units (0.1 units/kg/hour intravenously), as a continuous infusion NOTE: Soluble Insulin given as an intravenous bolus is rapidly destroyed within a few minutes. Intravenous insulin must always be given as a continuous infusion. When blood sugar levels reach 10 -14 mmol/L reduce to 2-4U/h (0.05 units/kg/hour) or titrate against blood glucose levels and when a patient is able to take oral feeds give soluble insulin 2-3 times before meals

OR

ii. Initially soluble insulin 20 units intramuscularly stat then 5-10 units intramuscularly hourly until blood sugar is 14mmol/L. When blood glucose is 10 – 14mmol/L give 8 units 4 hourly subcutaneously until the patient is able to take oral feeds. When the patient is taking food orally, change to soluble subcutaneously twice or three times before meals.

4.1.4. Hypoglycaemia in Diabetes Mellitus

Description

This is a condition in which the blood sugar falls to lower than 3 mmol/L with the attendant signs and symptoms of the disorder. The classical clinical features may, occur at higher levels than this in some patients, especially those with poorly controlled type 2 diabetes. The causative factors include inadequate or delayed food consumption, alcohol consumption, excess insulin dosage or wrong injection technique, exercise, inattention or combination of these factors.

Clinical features

Symptoms

- Weakness
- Fatigue
- Sweating
- Hunger
- Abdominal pain
- Headache
- Nausea

Signs

- Pallor
- Tremor
- Tachycardia
- Irritability
- Speech difficulty
- Incoordination
- Loss of concentration
- Drowsiness
- Abnormal behaviour
- Disorientation
- Convulsions
- Coma

Treatment

In all diabetics in a coma, with no means of ascertaining the blood glucose level, give oral or intravenous glucose. If the patient is conscious and able to take orally give a sugar-containing drink or food. If the patient is unable to take orally give:

i. 20 ml of 50% glucose as an intravenous bolus (OR 50 ml of 20% glucose)
ii. Follow up if necessary with intravenous infusion of 10% or 20% glucose, 100ml/hour. OR
iii. Administer 0.5 mg to 1.0 mg glucagon intramuscularly or intravenously. IM or IV Glucagon must be followed by oral glucose
iv. A continuous infusion of 10% or 20% glucose (dextrose) may be required for 24 to 72 hours if overdosage of long-acting insulin or sulphonylureas (chlorpropamide or glibenclamide) is the cause of the hypoglycaemia

Monitor blood glucose regularly and maintain between 6 and 8 mmol/L.

4.1.5. Diabetes Mellitus in Pregnancy

Gestational Diabetes Mellitus (GDM)

Description

GDM is diabetes that is first diagnosed in the second or third trimester of pregnancy that is not pre-existing type 1 or type 2 diabetes and resolves after child delivery.

Women diagnosed with diabetes in the first trimester of pregnancy should be classified as having Type 2 diabetes or, Type 1 diabetes or monogenic diabetes.

GDM is a risk factor for the development of type 2 diabetes after delivery. Therefore, women with a history of GDM should receive lifelong screening for prediabetes and type 2 diabetes.

Diabetes mellitus in pregnancy is usually seen in women who are already diabetic before pregnancy or have had a history of diabetes in the family. However, when this condition occurs in non-diabetics it usually presents in the second trimester.

All pregnant diabetic patients should be referred for specialist treatment. Known diabetic patients should be counselled before conception and diabetes should be well controlled both before conception and throughout the pregnancy. (See also chapter 5.7.1).

5. OBSTETRIC AND GYNAECOLOGICAL CONDITIONS

5.1. ANTENATAL CARE

The goal of antenatal care is to promote maternal and newborn health and survival through:

- Early detection and treatment of problems/complications in the mother and foetus e.g. proteinuria, hypertension, syphilis, foetal abnormality, mal-presentation, intrauterine growth retardation, etc.

Prevention of complications and diseases such as malaria, anaemia and neonatal tetanus.

- Birth preparedness and complication readiness. Provide a Birth Plan which indicates the place of delivery and transport to the delivery site among other key decisions.
- Health promotion e.g., health education, counselling and provide supplementation of iron, folic acid, iodine, calcium and vitamins, provision of ITNs.

A minimum of 8 antenatal contacts are recommended, with the first contact scheduled to take place in the first trimester (up to 12 weeks' gestation), Two contacts scheduled in the second trimester (at 20 and 26 weeks' gestation) and 5 contacts in the third trimester (at 30, 34, 36, 38 and 40 weeks' gestation. The client should return for delivery if not delivered at 41 weeks.

During the first visit, the following should be done:

- General, obstetric and gynaecological history
- Full physical examination
- Basic investigations i.e. confirmation of pregnancy, Hb, Group and Rhesus, HIV, RPR, Hepatitis, urinalysis and ultrasound where available
- Supplements i.e. haematinics (iron 30 – 60 mg elemental Iron daily, Folic acid 400mcg or 0.4mg daily, Mebendazole 500mg stat)
- Malaria (IPT-SP up to 6 doses can be given at least one month apart between doses – 3tabs of 500mg/25mg SP). Patients on Co-trimoxazole should not receive SP.
- Tetanus prophylaxis should be given
- Provider Initiated Counselling and Testing (PICT)

During the second and subsequent visits, the following should be done:

- Examine for growth of the foetus
- Maternal well being
- Check on medications given previously

- Check presentation of the foetus
- Discuss the place of delivery and mode of delivery
- Discuss warning signs/danger signs
- Malaria prophylaxis (IPT-SP)
- Iron and folic acid supplementation
- ART/PrEP
- Viral load at 36 weeks (a month before delivery)

5.2. NORMAL LABOUR

Monitoring of labour

- Maintain infection prevention practices
- Use a partogram on all patients
- Check for foetal and maternal well-being and progress of labour
- Provide active management of the third stage of labour.
- After the baby has been delivered onto the mother's abdomen, palpate the abdomen to rule out the presence of an additional baby(s) and then give oxytocin 10 units intramuscularly within 1 minute of delivery

Oxytocin is preferred and effective 2 to 3 minutes after injection, has minimal side effects and can be used in all women. If oxytocin is not available, give Ergometrine 0.2mg intramuscularly or Misoprostol 600mg sublingual. Make sure there is no additional baby(s) in the uterus before giving these medications.

Clamp the cord close to the perineum using sponge forceps (Spencer Wells) and deliver placenta using controlled cord traction. Allow sufficient flow of blood to the baby before clamping. Hold the clamped cord and the end of the forceps with one hand. Place the other hand just above the women's pubic bone and stabilize the uterus by gently pushing the uterus up. This helps prevent inversion of the uterus

Keep slight tension on the cord and await a strong uterine contraction or rub up a contraction. If necessary, use sponge forceps (Spencer Wells) to clamp the cord closer to the perineum as it lengthens. Do not wait for a gush of blood before applying traction on the cord.

Keep slight tension on the cord and await a strong uterine contraction or rub a contraction. If necessary, use sponge forceps (Spencer wells) to clamp the cord closer to the perineum as it lengthens. Do not wait for a gush of blood before applying traction on the cord

When the uterus becomes rounded or the cord lengthens, very gently pull downwards on the cord to deliver the placenta. Continue to stabilise the uterus with the other hand.

If the placenta does not descend during 20-30 seconds of controlled cord traction (i.e. there are no signs of placental separation), do not continue to pull on the cord:
–Gently hold the cord and wait until the uterus is well contracted again. If necessary, use sponge forceps to clamp the cord closer to the perineum as it lengthens.
–With the next contraction, repeat controlled cord traction with counter traction.

Analgesia in labour

- Pethidine 100mg IM stat
- Naloxone 10 micrograms/kg may be given to a neonate to reverse Pethidine induced respiratory depression

General care

- Encourage women to be with a support person at all times.
- Encourage ambulation and frequent oral fluid intake
- At delivery woman must choose which position to take

Immediately following birth

- Gently perform a uterine massage
- Provide oxytocics/ergometrine
- Estimate blood loss
- Examine for and repair lacerations
- Examine placenta and membrane for completeness
- Provide close surveillance of vaginal bleeding, uterine hardness and vital signs during the first 6 hours postpartum:

– Every 15 minutes for the first two hours; then
– Every 30 minutes for the next one hour; then
– Every hour for the next three hours.

- Initiate breastfeeding within an hour of delivery;

– Promote early and exclusive breastfeeding
– In the event of the mother being HIV positive, ensure the mother is on ART and the baby receives ART for the duration of breastfeeding

5.3. ANTEPARTUM HAEMORRHAGE (APH)

Description
Antepartum haemorrhage (APH) is defined as per vaginal bleeding after 22 weeks of gestation to delivery of the baby.

The main causes of APH are
- Placenta previa
- Abruptio placentae
- Cervical lesions e.g. cancer, ectopy, polyp
- Vasa Previa

Clinical features
- Painful or painless PV bleeding (provoked or unprovoked)
- The uterus may be woody hard with no relaxation
- High pulse rate
- Low blood pressure
- Air hunger with severe bleeding
- Other signs of shock e.g. cold clammy hands

Investigations must distinguish between placenta previa and abruptio placentae. No vaginal examination is to be performed. Speculum examination should only be performed after placenta previa has been ruled out. Refer to a hospital

Emergency care
- I.V access
- Normal saline infusion
- Transfer to hospital for confirmation of diagnosis by clinician or examination by ultrasound scan, where available, for clinical examination
- Rh-negative patient may need anti-D

Note that antepartum haemorrhage is a serious complication

5.3.1. Placenta previa

Description
This is a condition in which the placenta is implanted in the lower segment of the uterus.
Clinical features
- Painless PV bleeding
- ± malpresentation, high presenting part

- Present foetal heart
- Recurrent vaginal bleeds
- Relaxed uterus

Specific management
If the baby is premature and bleeding has stopped, conservative management is recommended until 36 - 38 weeks:

- Keep woman in the hospital until delivery
- Crossmatch 2 units of blood at all times
- Keep haemoglobin at more than 9g using haematinics or blood transfusion
- Give Dexamethasone 6mg 12 hourly 4 doses intravenously/intramuscularly.
- If there is heavy bleeding proceed to caesarean section

Plan delivery if foetus is mature, dead, or has major anomalies

5.3.2. Abruptio placentae

Description
This is a condition in which there is premature separation of a normally implanted placenta before delivery of the baby. The patient must be referred to a hospital.

Clinical features
- May have been provoked by Artificial Rupture of Membrane (ARM), External Encephalic Version (ECV), hypertensive disorder
- Painful Per Vaginal (PV) bleeding
- Foetus may be dead, difficult to feel foetal parts
- Height of fundus may be higher than dates
- Tender tense abdomen
- Signs of shock
- Retro placental bleeding may be concealed

Specific management
- Nurse in high dependency ward
- Rapid infusion of normal saline or ringers lactate
- Crossmatch 4 units of blood and commence transfusion as soon as possible
- Catheterise patient
- Give morphine 15mg intramuscularly stat

- Do bedside clotting time
- Perform artificial rupture of membranes to induce labour
- Active management of the third stage
- After delivery give oxytocin 10 units in normal saline running at 20 drops per minute for 2 – 4 hours

Be aware of postpartum haemorrhage due to atonic uterus or coagulopathy.

5.3.3. Cervical lesion

Cervical lesions can cause bleeding in pregnancy and should be checked. Remember that a speculum should only be passed after a scan has been done to locate the placenta to avoid precipitating bleeding in a placenta praevia. The following should be checked:

- Cancer of the cervix
- Cervical ectopy
- Cervical polyps

5.3.4. Vasa Previa

Description

A condition in which the foetal blood vessels are unsupported by either the umbilical cord or placental tissue, traverse the foetal membranes of the lower segment of the uterus below the presenting part. Vasa Previa occurs when foetal blood vessel(s) from the placenta or umbilical cord cross the entrance to the birth canal, beneath the baby. It can result in rapid foetal haemorrhage or lack of oxygen.

Symptoms

- Present with sudden onset of abnormally heavy or small amounts at rupture of membranes.
- Foetal bradycardia, then death.

Warning Signs

Very difficult to diagnose antenatally before rupture of membranes

- Low-lying placenta
- Painless birthing bleeding.

Investigations

- Ultrasound
- Check the placental cord connection for velamentous cord insertion.

- Sonography
- Colour Doppler

Supportive Treatment
- Use of tocolytics to stop all uterine activity
- Bedrest
- No sexual intercourse
- No vaginal examinations
- No lifting of heavy items
- No heavy straining during bowel movements (use of stool softeners)

Hospitalization; (if suspected antenatally)
- Foetal monitoring
- Regular ultrasounds to monitor the progression of vasa previa
- Steroid treatment to develop fetal lung maturity
- Elective delivery, most important
- Initiate breastfeeding within an hour of birth

When not diagnosed antepartum, aggressive resuscitation complete with blood transfusion for the infant if necessary must be planned for and/or expected.

5.4. POSTPARTUM HAEMORRHAGE (PPH)

Description

This is per vaginal (PV) bleeding of 500ml or more or any amount resulting in cardiovascular collapse or hypovolaemic after delivery of the baby. It is called primary PPH when it occurs within the first 24 hours and secondary PPH thereafter up to 6 weeks.

This is caused by:
- Atonic uterus
- Genital tract trauma, e.g., ruptured uterus, cervical vaginal tears and vulval haematoma
- Secondary coagulopathy
- Uterine sepsis

Clinical features
- Excessive vaginal bleeding
- May be in shock
- High pulse rate equal to or more than 100/min

- Low BP less or equal to 80/40mm
- Air hunger (restlessness)
- Cold sweat

Emergency care
To provide a timely surgical plan such as uterine tamponade, B Lynch suture, hysterectomy, internal iliac artery ligation.
This must be teamwork

- Call for help
- Rub up the uterus for a contraction and to expel clots
- Obtain IV access with 2 large-bore cannulas (16G or 14G). Start IV fluids (NS/Ringers Lactate: the first litre to run in fast in 15minutes.
- Repeat oxytocin 10 units intramuscularly
- Give oxytocin 20 units in 1Litre normal saline running at 20 drops per minute or oxytocin 40IU IV in 500ml of NS at 125ml/hr. Where ergometrine or syntometrine is available give 0.5mg IM/IV stat or intramural.
- If bleeding persists, and to be given only within 3 hours of PPH tranexamic acid 1g in 10ml (100mg/ml) IV at 1ml/min over 10minutes. The dose can be repeated after 30 minutes if bleeding persists.
- Misoprostol 1000mcg (5 x 200microgram tabs) PR can be given alternatively or in addition to;
- Bimanual compression of the uterus to be done concurrently.
- If bleeding persists, then intrauterine tamponade using inflated Foley catheter or condom (500mls of N/saline)
- Give blood and fluid replacement as required
- Monitor urine output/catheterise the bladder
- If PV bleeding persists yet uterus is well contracted, check genital tract for trauma and for coagulopathy
- Where available, central venous pressure (in the absence of coagulopathy) monitoring is valuable
- In uncontrollable PPH timely surgical intervention is important, then OT for B Lynch/Hayman brace suture, uterine artery ligation or hysterectomy to be done.

Nurse in high dependency ward - Special Observation Unit (SOU) of the hospital.

5.5. UNCONSCIOUS OBSTETRIC PATIENT

A pregnant woman may be brought into a health facility unconscious without much history. Management therefore will mainly depend on clinical examination and investigations. The obstetrician should work in collaboration with the physician.

Differential diagnosis

- Eclampsia
- Cerebral Malaria
- Meningitis
- Hypovolaemic shock
- Organophosphate poisoning
- Diabetic coma

Management

Call for Help

The following should be done as the Airway, Breathing and Circulation (ABC) of resuscitation:

- Take a quick history from carer and note the patient's previous notes
- A quick examination should include; blood pressure (BP), pulse, temperature, jaundice, cyanosis, hydration, sweating, cold clammy extremities, respiration, heart sounds, PV bleeding, fundal height, foetal viability and neck stiffness.

Investigation

Cerebral spinal fluid for bacteriology and biochemistry, blood for haemoglobin level, malaria slide, blood sugar and urea urinalysis

Treatment

- Keep airway patent and give oxygen (patient may need ventilation)
- Secure intravenous line access, start with 50mls of 50% dextrose unless sugar levels are normal
- Atropine 0.6 – 2.4mg IV /15min until normal pulse/dilatation of pupils for organophosphate poisoning
- Treat cause
- Catheterize
- Nurse in a left lateral position
- Keep patient in a high dependency ward (Special Observation Unit)

5.6. PRE-ECLAMPSIA AND ECLAMPSIA

Description

Pre-eclampsia is pregnancy-induced hypertension with proteinuria occurring after 20 weeks of gestation. There are 2 types; mild pre-eclampsia and severe pre-eclampsia. When convulsions appear in this syndrome it is then called eclampsia. This is an obstetric emergency requiring immediate referral to a hospital

Diagnosis

5.6.1. Mild pre-eclampsia

This is when two measurements of diastolic blood pressure taken 4 hours apart read 90-100mmHg with proteinuria up to 2+ and above.

5.6.2. Severe pre-eclampsia

This is when diastolic blood pressure is 110mmHg or more with increasing proteinuria of 3+ or more.

5.6.3. Eclampsia

This is when there is a diastolic blood pressure of 90mmHg or more with proteinuria of 2+ or more and convulsions.

The signs of impending eclampsia are:

- Epigastric tenderness
- Increased tendon reflexes
- Blurred vision

5.6.4. Pre-eclampsia management in outpatients

The reduction of blood pressure does not abort the progression of the disease process and its effect on the foetus. At present, the only effective management of preeclampsia is delivery of the baby. The more severe the disease condition, the greater the risk to both the mother and the baby. If the risk to the mother's health is significant the baby should be delivered even if it is nonviable. If the disease is mild or moderate the baby can be kept in utero until it is viable provided close observation is kept on the mother, looking out for the complications of pre-eclampsia.

All patients with pre-eclampsia should have a mid-stream urine (MSU) specimen taken and be seen by a specialist. A check should be kept on the baby's growth with serial measurement of symphysio-fundal height. The woman should keep a kick chart. No anti-hypertensive medications are usually required for mild pre-eclampsia.

5.6.5. Mild pre-eclampsia and gestation less than 37 weeks

Management should include:

- Monitoring blood pressure
- Monitoring of foetal well-being (kick chart, serial scans)
- Monitoring of urine output and urinalysis for proteinuria
- Renal function test
- Normal diet

Do not give anti-hypertensives, sedatives, tranquillisers or anticonvulsants.

5.6.6. Severe pre-eclampsia and eclampsia

Once the blood pressure is above 160/110mmHg the mother is at risk of stroke. Other complications include:

- Renal failure
- Cardiac failure
- Foetal death
- Eclampsia
- HELLP Syndrome

The definitive treatment is delivery. The baby should be delivered.

There are four principles involved in management:

- Prevention and control of convulsions
- Control of hypertension
- Maintenance of fluid balance
- Prevention of Respiratory Distress Syndrome (RDS) and Delivery of the baby

General Management

- For patients with eclampsia maintain an airway.
- Strict monitoring of urine output (should not be less than 30ml/hour)
- Urinalysis for proteinuria
- Renal function test
- Maintain strict fluid balance chart

- Do bedside clotting test (failure of a clot to form after 7 minutes or a soft clot that breaks down easily suggests coagulopathy)
- Nurse in a left lateral position

Prevention of convulsions

In severe preeclampsia it is important to prevent convulsions as the risk is very high:

- Magnesium sulphate 4g (20mls of 20%) IV over 20min followed by 5g (10mls of 50%) IM in each buttock. Add 1ml of 2% lignocaine to IM injection. Give $MgS0_4$ every 4hours up to 6 doses, to be given once decision to deliver has been made.

Management of convulsions

The drug of choice is magnesium sulphate injection. Diazepam, despite its effects on the baby, may be used when magnesium sulphate is not available. Diazepam injection must be given intravenously, never orally or intramuscularly.

- Call for help
- Check airway, breathing and circulation (ABC)
- Protect patient from injury (place on left lateral position, place in bed with side rails or on the floor)
- Nurse in high dependency ward or ICU
- Control BP (goal SBP<160, DBP < 110): give Hydralazine IV or Nifedipine PO or Labetalol
- Prevent more seizures: give $MgSO_4$ 4g (20mls of 20%) IV slowly over 20 minutes Loading Dose.
- Follow promptly with MgS04 5g (10mls of 50%) in each buttock deep IM add 1ml of 2% lignocaine in the same syringe. If convulsions re-occur, give 2g, 20% $MgS0_4$ IV over 5 minutes.
- Maintenance dose: give 5g (10mls of 50%) $MgS0_4$ IM with 1 ml of 2 % lignocaine every 4 hours in alternate buttocks until 24 hours after birth or after last convulsion (whichever is later)
- Once fits are controlled assess for the mode of delivery (assisted vaginal delivery or caesarean delivery).

Before repeating $MgSO_4$ administration, ensure that:

- Respiratory rate is at least 16 per minute
- Patellar reflexes are present
- Urine output is at least 30ml per hour over 4 hrs.

Withhold or delay $MgSO_4$ if:

- Respiration rate falls below 16 per minute

- Patellar reflexes are absent
- Urinary output falls below 30ml per hour over preceding 4 hrs.
- Keep antidote ready

In case of respiratory arrest

- Assist ventilation (mask and bag apparatus, intubation)
- Give an antidote, calcium gluconate 1g (10ml of 10% solution) intravenously slowly over 10 minutes until respiration begins.
- As an alternative to magnesium sulphate, give diazepam bolus 5-10mg IV over 2 minutes if the patient is convulsing.

Management of hypertension in pregnancy

The drug of choice is Hydralazine. The drug should be titrated against the blood pressure to achieve a diastolic pressure of 90 – 100mmHg.

- If diastolic BP 110mmHg reduce by giving Hydralazine IV 5mg bolus and repeated every 20 to 30 minutes or give nifedipine 10mg sublingually
- Labetalol 20-40 mg i.v every 10-15 minutes (Maximum dose 220mg. Avoid Labetalol in asthma and congestive cardiac failure)
- Give Methyldopa 250 mg -500mg every 6-8 hours orally for maintenance, or
- Labetalol 100mg oral b.i.d (maximum dose 2400mg/day).

Fluid Balance

Fluid input and output must be monitored. Fluid should be replaced as required. However, be aware of fluid overload. Do not give more than 2.5 litres in 24 hours.

No matter how oedematous a woman is if the urine production goes below 30ml/hour, the patient should be given a fluid challenge of 1 litre 0.9% Normal Saline given over 30 minutes. If the response is an increase in urine more fluid should be given. If there is no response the patient may be developing renal failure and should be referred to a specialist physician.

5.6.7. Pre-eclampsia and eclampsia in labour

- The patient should be monitored as a high-risk one with BP checked every 30 minutes or less if necessary listen for the foetal heart every 15 minutes and/or during and immediately after a contraction
- The patient must be catheterised and fluid input and output monitored
- The patient should be given adequate pain relief
- The second stage of labour should be kept short and an elective vacuum extraction or forceps delivery done as soon as the patient is fully dilated
- Fresh meconium in the liquor and heart rate abnormality signifies foetal distress and the baby should be delivered by caesarean section.

- Ergometrine should be avoided; instead, Oxytocin 5 units intramuscularly should be given with delivery of the anterior shoulder.

5.6.8. Care for the neonate

The baby is likely to be in a poor condition and may require resuscitation such as;

- Keep warm
- Give Oxygen Ambu bag as required
- Suction

Post-partum care
The patient must be closely monitored for at least 48 hours in a place where maximum care can be given. This usually means in the labour ward or a special observation unit (SOU) which is a high dependency unit.

5.7. MEDICAL DISEASES IN PREGNANCY

5.7.1. Diabetic Mellitus

Pregnancy may turn otherwise well-controlled diabetes into poorly controlled diabetes. Some women may develop diabetes during pregnancy. These cases must be referred to the hospital if attended at a health centre.

Diagnosis
Gestational diabetes mellitus

- Fasting plasma glucose 5.1 - 6.9 mmol/L
- 1-hour plasma glucose >10.0mmol/L following a 75g oral glucose load
- 2-hour plasma glucose 8.5 - 11.0mml/L

Diabetes Mellitus

- Fasting plasma glucose > 7mmol/L
- 2-hour plasma glucose ≥ 11.1mmol/L following a 75g oral glucose load

The following principles of care should apply:

- Pre-pregnancy counselling emphasizing the reduced risk of abnormalities and outcomes with the well-controlled disease at preconception
- Pregnancy counselling emphasizing better outcomes with well-controlled disease
- May need to change from an oral hypoglycaemic agent to insulin for better control

- Monitoring blood sugar with necessary adjustments to medication (there is increased tolerance to treatment with each trimester)
- Monitoring foetal growth and looking out for macrosomia with serial ultrasound scans
- In labour, monitor blood sugar and titrate medication to ensure normal levels are maintained
- Monitor labour with partograph
- Beware of shoulder dystocia in macrosomic baby
- Watch for hypoglycaemia in the baby (especially if maternal glucose levels not well controlled)
- Care for the newborn: keep warm, watch for electrolyte imbalance, also at risk of respiratory distress syndrome

Follow up mothers

Post-Natal Care
- The patient may resort to pre-pregnancy doses of insulin or hypoglycaemics
- Gestational diabetics may need a glucose tolerance test at 6 weeks as there is a risk of developing diabetes in some.

5.7.2. Cardiac diseases

The most common cardiac disease encountered in pregnancy is Rheumatic Heart Disease (RHD). The most prevalent of RHD is Mitral Stenosis (MS) and Mitral Incompetence (MI). (See Chapter 7).

Management
- Pre-pregnancy counselling and patient should be referred for an obstetric opinion before conception occurs
- Give Digoxin 0.25mg daily where there are arrhythmias as in atrial fibrillation.
- Frusemide should only be used in case of pulmonary oedema
- Admit to hospital in the 3rd trimester in case of pulmonary oedema.

In labour
Keep in high dependency ward in propped up position:
- The patient should be monitored as a high-risk one with Bp checked every 30 minutes or less, if necessary
- Listen for the foetal heart every 15 minutes and/or during and immediately after a contraction
- The patient must be catheterised and fluid input and output monitored
- The patient should be given adequate pain relief

- The second stage of labour should be kept short and an elective vacuum extraction or forceps delivery done as soon as the patient is fully dilated

Give:

- Pethidine 100mg IM or Fentanyl 50 – 100ug (Fentanyl may be repeated every hour as needed)
- Cefotaxime 1g 12 hourly (2 doses)
- Oxytocin 5-10 units IM with the delivery of the anterior shoulder for the third stage
- Frusemide 40mg IV in the third stage

Note: Avoid Ergometrine

Post-natal care

The patient must be closely monitored for at least 48 hours in a place where maximum care can be given. This usually means in the labour ward or special observation unit (SOU) which is a high dependency unit.

- Consider discharge after 3-4 days after delivery if all is well
- Discuss family planning
- Discuss the surgical treatment of heart disease

5.7.3. Malaria in Pregnancy

Pregnant women are particularly at risk due to the lowered acquired partial immunity during pregnancy. Adverse pregnancy outcomes include spontaneous abortion, stillbirth, severe maternal anaemia and low birth weight (weight <2500g).

Treatment for uncomplicated Malaria in pregnancy (MIP)

First-line treatment

- Quinine in the first trimester of pregnancy
- Artemether-Lumefantrine or Dihydroartemisinin-Piperaquine in the 2nd and 3rd trimester.

Second-line treatment

- Quinine should be used in all cases of failure to 1st line treatment.

Severe Malaria in pregnancy

Pregnant women, particularly in the second and third trimesters, are more likely to develop severe malaria than other adults. Parenteral antimalarials should be given to pregnant women with severe malaria in full doses without delay and must be started with:

- Quinine in the first trimester and
- Injectable artesunate in the second and third trimesters

Intermittent Presumptive treatment (IPT)
Sulphadoxine-Pyrimethamine (SP) is the medicine of choice for IPT. One adult treatment dose of 3 tablets should be given monthly (at least 4 weeks apart) during the second trimester from 13-weeks gestation onwards. The total number of doses recommended for the entire duration of pregnancy is up to 6 doses, under direct observation (DOT) when possible.

5.7.4. Elimination of Mother-to-Child Transmission of HIV (EMTCT)

The four prongs of EMTCT:
- Prong 1 – Primary prevention of HIV among women of childbearing age
- Prong 2 – Prevention of unintended pregnancies among women living with HIV
- Prong 3 – Prevention of HIV from mother to her infant
- Prong 4 – Provision of appropriate treatment, care and support to women and children living with HIV and their families.

Prevention of Mother-to-Child Transmission
- There are better clinical and laboratory outcomes if HIV treatment is initiated early.
- Initiate cART immediately among all pregnant or breastfeeding women who test positive within Maternal Newborn Child Health (MNCH) services.
- Treatment preparation and adherence counselling should be accelerated so that it is completed on the same day where feasible.
- Initiation may be done by ART trained nurses/midwives within MNCH.
- Where there is no capacity within MNCH to initiate cART the pregnant woman should be fast-tracked through the ART clinic.
- Start Cotrimoxazole among all HIV infected pregnant women regardless of gestational age, CD4 count or WHO clinical staging.
- Viral load should be performed within 4 weeks before labour and delivery to estimate the risk of transmission for all pregnant women on cART.
- At 6 weeks postnatal, check CD4 count and if >350cells/ul on two results, Cotrimoxazole may be discontinued.

Combination antiretroviral therapy (cART) for eMTCT

First-line cART

- For ARV naïve or sure of tail coverage 1st line cART is **TDF + XTC + DTG** - alternative regimen is
  TDF + XTC + or EFV_{400} or TDF + XTC + ATV-r (or LPV-r) or ABC +3TC +ATV-r (or LPV-r) or ABC + 3TC + DTG
- For previous single dose Niverapine (sdNVP) exposure; or Niverapine (NVP) monotherapy exposure, or unsure of tail coverage 1st line cART is **TDF + XTC + DTG** - alternative regimen is TDF + XTC + ATV-r (or LPV-r) or ABC + 3TC + ATV-r (or LPV-r).

Second- line cART

- DTG and NNRTI –based first-line regimens can be substituted by **AZT +3TC + LPV-r (or ATV-r)**

EMTCT in Pregnancy and Women of child-bearing age

Description	*HIV-Negative Female of child-bearing age*	*HIV-Positive Female of child-bearing age*
1st Trimester	*Screen for Hep-B, Syphilis; if +ve treat client +ve partner*	*Counsel and continue/Initiate ART*
	Counsel and Initiate PrEP if eligible	*Screen for Hep-B, Syphilis and OIs; if +ve treat client + partner*
		• *At ANC1, for known +ves on ART, check if VL was done: if >3 months retest, if >3 months repeat, and thereafter every 3 months* • *For those who initiate ART in ANC do VL at 3 months, thereafter retest every 3 months*
	Counsel client and partner on HIV combination prevention • *Provide condoms or information on where to access condoms, including female condoms* • *Refer to youth-friendly services for more comprehensive sexual information, including HIV prevention* • *Retest for HIV every 3 months*	*Provide condoms or information on where to access condoms, including female condoms*
2nd Trimester	*Screen for Hep B, Syphilis If +ve treat client + partner*	*Counsel and continue/Initiate ART*
	Counsel and Initiate PrEP if eligible	*Screen for Hep B, Syphilis and OIs, if +ve treat client + partner*
	Counsel client and partner on HIV combination prevention • *Provide condoms or information on where to access condoms, including female condoms* • *Refer to youth-friendly services for more comprehensive sexual information, including HIV prevention* • *Retest for HIV every 3 months*	• *At ANC1, for known +ves on ART, check if VL was done: if >3 months retest, and thereafter every 3 months* • *For those who initiate ART in ANC do VL at 3 months, thereafter retest every 3 months*
		Provide condoms or information on where to access condoms, including female condoms
3rd Trimester	*Screen for Hep B, Syphilis If +ve treat client + partner*	*Counsel and continue/Initiate ART*
	Counsel and Initiate PrEP if eligible	*Screen for Hep B, Syphilis and OIs, if +ve treat client + partner*
		• *Check if VL was done/do if not done and if >3 months repeat* • *Repeat viral load 1- 4 weeks before delivery*
	Counsel client and partner on HIV combination prevention • *Provide condoms or information on where to access condoms, including female condoms* • *Refer to youth-friendly services for more comprehensive sexual information, including HIV prevention* • *Retest for HIV every 3 months*	*Provide condoms or information on where to access condoms, including female condoms*
Labour and	*Do HIV test if done >6 weeks*	*Counsel and continue/Initiate ART*

Management of HIV-exposed infants

a)High-risk HIV exposed infants

1. Born to women with established HIV infection and has received less than 12 weeks of cART at the time of delivery or
2. Born to women with established HIV infection with viral load >1000 copies/ml within the four weeks before delivery:

Management

- Start or continue cART immediately for the mother and all exposed infants to be put on AZT/3TC+NVP for 12 weeks.

Note: The use of NVP is only for prophylaxis in infants and treatment for up to 2 weeks of age in absence of Raltegravir.

b) High risk exposed infants

1. Born to women with established HIV infection not on cART;
2. Born to known HIV positive woman who refuses cART.

Management

- Start or continue cART immediately/continue counselling for the need to start therapy. Suggest to start cART with the possibility of stopping after delivery (Option B) while counselling continues toward the mother accepting lifelong cART (Option B+).
- Prophylactic ART (AZT/3TC+NVP) until confirmed final outcome HIV negative after complete cessation of breastfeeding.

Low-risk HIV exposed infants

1. Known HIV positive women on cART for more than 12 weeks, continue cART for the mother and all exposed infants to be put on **AZT/3TC +NVP for 6 weeks.**
2. HIV negative mother with a known positive partner does a nucleic acid test (NAT), if negative, continue pre-exposure prophylaxis (PrEP) and provide HIV testing services every 3 months. If NAT on mother is positive do NAT on the baby.

5.8. ABORTION

This is the expulsion of products of conception, usually before 24-weeks gestation. The contents of conception may or may not be completely expelled. It may be spontaneous or induced.

Clinical features

- Vaginal bleeding
- Ruptured membranes
- Expulsion of foetus
- Static uterine size (missed abortion)
- Abdominal pain/tenderness
- May have fever

Management

This depends on the type of abortion:

- Missed, incomplete, septic abortions need evacuation of the uterus
- Septic abortion needs aggressive management with antibiotics.
- For inevitable abortion await expulsion of a foetus or augment with Oxytocin
- Infuse IV fluids as required

Emergency treatment

- Look out for signs of hypovolaemic shock and treat appropriately
- Where Manual Vacuum Aspiration (MVA) is indicated, provide pre-MVA counselling on the procedure
- Monitor blood pressure, pulse and temperature
- Look for signs of anaemia
- Evacuate uterus, preferably by MVA
- Give Oxytocin 5-10Units IV

Supportive

- Provide psychological support to patient and care
- Treat infection with appropriate antibiotics
- Provide post-MVA counselling
- Provide family planning counselling
- Facilitate linkages to other reproductive health services.

5.9. MEDICAL ABORTION (TERMINATION OF PREGNANCY)

Description

Under the Termination of Pregnancy Act, Cap 304 of the Laws of Zambia, termination of pregnancy (TOP) relates to an induced abortion when a pregnancy is terminated by a registered medical practitioner if he/she and two other registered medical practitioners, one of whom has specialised in the branch of medicine in which the patient is specifically required to be examined before a conclusion could be reached that the abortion should be recommended.

The Act provides the general framework under which a pregnancy can be terminated.

According to the Act, an abortion in Zambia can be conducted under the following circumstances:

i) Risk to the life of the pregnant woman, or
ii) Risk of injury to the physical or mental health of the pregnant woman, or
iii) Risk of injury to the physical or mental health of any existing children of the pregnant woman greater than if the pregnancy were terminated, or
iv) Substantial risk that if the child were born, it would suffer from such physical and mental abnormalities as to be seriously handicapped.

Women eligibility:

i) If gestation ≤12 weeks; if the medical doctor, after consulting with a second doctor or registered midwife, is satisfied that;
- Pregnancy was from rape or incest, or
- There is a substantial risk that the foetus would suffer from a severe mental or physical abnormality, or
- The continued pregnancy would pose a risk to the mother's physical or mental health, or
- Continued pregnancy will significantly affect the social or economic circumstances of the woman.

ii) If gestation ≥12 weeks; if the medical doctor, after consulting with a second doctor or registered midwife, is satisfied that continuing the pregnancy would endanger the mothers' life, pose a risk of injury to the foetus, or result in a severe foetal malformation.

Setting

- Public health facilities are legally obligated to provide abortion-related services.
- Private health facilities registered with HPCZ and offering other RH services can also offer abortion-related services.
- Procedure for TOP should be done in a hygienic environment by skilled staff (medical doctors, midwives) trained in performing medical TOP.

General Measures

- All women undergoing TOP must have certificate of opinion A or B completed not later than 24 hours after such termination in the case of certificate B
- Provide pre-and post-termination counselling as essential
- Obtain consent from the woman for TOP and related procedures (e.g. laparotomy, MVA, etc.).
- If the patient's age is below that of legal consent to a medical or surgical procedure (less than 18 years of age), the parents or legal guardian approval to terminate the pregnancy must be documented. The best interest of the minor will take precedence over that of the parents or guardian.

- In the case of conflict between the woman and the partner/spouse, the woman's decision takes precedence.
- For all patients, a pertinent medical history and physical examination including a bimanual examination must be obtained and documented.
- Anti-D where available should be offered to non-immunized RH negative women especially after the first trimester.
- Offer contraception post-TOP

• When a patient with a positive pregnancy test presents with vaginal bleeding and/or pelvic pain, ectopic pregnancy should be considered and ruled out urgently. Where necessary and available, the following tests could be done

a) Pregnancy test
b) Hb if the patient is clinically anaemia
c) Ultrasound scan to confirm gestation age, rule out abnormality where indicated, rule out ectopic pregnancy where there is suspicion and to confirm the completeness of uterine evacuation where necessary.

Referral

• If service not available (e.g. facility not accredited), refer to the designated level of care as soon as possible (within 2 weeks)
• If gestation ≥20 weeks.

5.9.1. Uterine Evacuation Procedures

5.9.1.1. For pregnancies up to 12 completed weeks of gestation, methods used for evacuation include:

- Surgical (manual vacuum aspiration (MVA), electric vacuum aspiration)
- Medication (Mifepristone combined with Misoprostol, or Misoprostol alone where mifepristone is not available).

General Measures:

- Confirm pregnancy with a urine test.
- Determine the gestational age with ultrasound. If ultrasound is unavailable, use dates (LMP) and bimanual (pelvic) examination.
- If unsure of dates, or examination disagrees with dates, or uterus palpable abdominally, or the woman is obese or difficult to examine, arrange pre-procedure ultrasound.
- Ultrasound is mandatory if suspected ectopic pregnancy – refer if uncertain.
- Counselling.
- Outpatient procedure by nursing staff with specific training.
- Screen for STIs (if treatment needed, do not delay TOP).
- Arrange Pap smear if needed.
- Check HIV status, Hb and blood group (Rh).
- Counsel and start contraception post-TOP, before leaving the facility. Arrange contraception follow-up.

Medicine Treatment

- Mifepristone 200mg PO immediately as a single dose.

Followed 24–48 hours later by:

- Misoprostol 800mcg PV or SL

If expulsion does not occur within 4 hours of Misoprostol administration, a second dose of Misoprostol 400mcg PO or PV may be given.

Note:

- Allowing home use of Mifepristone and Misoprostol after counselling and clinical evaluation at a health care facility can improve the privacy, convenience and acceptability of services, without compromising on safety.
- Patient's instructions must include information about the use of medication at home and symptoms of abortion complications and what to do in such cases.
- Medical abortion and in particular, use of Misoprostol, for pregnancies over 12 weeks should be facility-based to facilitate the need for repeated.
- The patient must be informed that if the medical abortion fails, the surgical method may be needed.
- The facility must provide an emergency contact on a 24-hour basis and must assure referral for uterine aspiration if indicated for patients self-administering misoprostol and/or mifepristone at home following clinical evaluation and counselling at a health care facility.
- Healthcare providers should ensure that all victims of SGBV should be linked to other supportive services including prevention and management of STIs, HIV, unwanted pregnancy and need for Post Exposure Prophylaxis (PEP), psychosocial counselling and shelter. Establish effective referral systems through formalized agreements between stakeholders.

For pain:

After administration of Mifepristone, start:

- Paracetamol 1g PO 4–6 hourly when required to a maximum of 4 doses per 24 hours (Maximum dose: 15mg/kg/dose or 4g in 24 hours).

ADD

After expulsion is complete:

- Ibuprofen 400mg PO 8 hourly with or after a meal.

OR

5.9.1.2. TOP using manual vacuum aspiration (MVA) - if gestation >14 weeks:

- Medical abortion or Dilatation and Evacuation (D&E) are the preferred methods for evacuating the uterus in the second trimester after cervical preparation/priming/ ripening.
- Misoprostol 400mcg PV 3 hours before vacuum aspiration of the uterus.

Note:

Cervical preparation (ripening/priming) is recommended for

a) Nulliparous women

b) Women less than 18 years old, and

c) All women at 12-14 weeks of gestation and above.

Routine analgesia for vacuum aspiration:

Consider para-cervical block if trained in the technique. All women undergoing MVA for induced abortion must be offered para-cervical block.

Alternatively; Oral analgesia as required for 48 hours:

- Paracetamol 1g PO 4–6 hourly when required to a maximum of 4 doses per 24 hours, AND
- Ibuprofen 400mg PO 8 hourly with or after a meal.

For both medical and surgical TOPs (MVA):

In Rh-negative, non-sensitised women: Give Anti-D immunoglobulin 50–100mcg IM preferably within 72 hours but may be given up to 7 days following TOP.

Clinical protocols for post-operative care must be followed.

Review all patients after 7 days: if bleeding persists, arrange urgent ultrasound.

Referral

- If gestation ≥12 weeks.
- If gestation is uncertain.
- If any signs or symptoms of ectopic pregnancy or other early pregnancy complications.
- Co-morbid conditions (heart disease, asthma, diabetes, anaemia, clotting disorder, seizure disorder, substance abuse, hypertension).
- Large fibroids (may interfere with determining gestation age and/or MVA).

- Any signs of sepsis (tachycardia, hypotension, pyrexia, tachypnoea, offensive vaginal discharge).
- If MVA not available or declined.

5.9.1.3. Late second trimester terminations (Therapeutic)

- TOP in the late second trimester is sometimes necessary. Termination done in late second trimester should be done in obstetrics and gynaecology sections of the hospital.
- All facilities should have clear and evidence-based protocols for TOP in the late second trimester.
- Hospitalisation is required for all patients having a termination of pregnancy in the late second-trimester abortion
- Bereavement counselling should be offered to all women undergoing TOP in the late second trimester

Guideline:

1) Patient must be informed that should medical methods fail surgical methods such as D & E may be needed and with a possibility of hysterectomy.
2) Expulsion of a live foetus is a possibility which fact must be discussed with a patient.

5.9.2. Post-abortion care (PAC)

PAC is safe when provided by a trained provider in an environment with adequate hygiene and suitable equipment. All institutions offering PAC services should be registered by appropriate regulatory authorities.

PAC can be provided from health levels as low as the health post (depending on available skills and clients condition) up to tertiary level. All institutions providing PAC should be guided by local protocols.

Emergency preparedness should be available in all facilities providing PAC. All facilities should be able to stabilize, treat or refer patients with post-abortion complications.

5.9.2.1. Emergency treatment

- Assessment should include assessment of vital signs and indication of how clinically stable the patient is.
- Any patient discovered with a life-threatening condition such as shock, ectopic pregnancy, sepsis or haemorrhage should have resuscitative measures instituted immediately.

- Physical examination should include a pelvic examination noting any vaginal discharge, vaginal bleeding, uterine size and presence of retained products of conception (RPOCs). Signs of infection including fever, foul-smelling discharge, and tender uterus should also be documented.
- If an infection is suspected, appropriate laboratory specimens should be taken but should not delay the initiation of treatment.
- Appropriate laboratory tests such as HB, blood grouping and cross matching and any other tests indicated by the medical condition of the patient should be done.

For the management of complications, refer to local protocols or the National Standards & Guidelines for Comprehensive Abortion Care in Zambia.

5.10. MENSTRUAL DISORDERS

It is important to decide whether the menstrual disorder is truly a menstrual disorder or not. The menstrual history, type of contraceptive used, history of previous pregnancies, kind of discharge and related issues must be noted. The abdomen must always be examined for tenderness or masses. The vagina should also be examined and the condition of the cervix and any discharge should be noted.

5.10.1. Dysmenorrhea

Description

This is severe pain associated with the menstrual cycle and is usually referred to as period pains. This may be due to gynaecological or non-gynaecological reasons.

There are two types:

- Spasmodic
- Congestive

5.10.1.1 Spasmodic

This occurs primarily in teenagers and young multiparous women, but is not uncommon in elderly multiparous women.

Management

- Empathy and reassurance.
- Simple analgesics such as Aspirin 600mg orally 3-4 times daily or Paracetamol 1g orally 3 - 4 times daily.

- In severe pain, Ibuprofen can be given 400mg twice daily throughout the menstrual period.
- If pain is very severe, contraceptive pills may be used for 6 months Congestive
- In this condition, the pain is due to an organic cause such as pelvic infection, fibroids and endometriosis

Management

- Empathy and reassurance
- Simple analgesics such as Aspirin 600mg orally 3 - 4 times daily or Paracetamol 1g orally 3 - 4 times daily

In severe pain, Ibuprofen can be given 400mg twice daily throughout the menstrual period

- Treat the cause

5.10.2. Amenorrhoea

Definition
It is a condition characterised by the absence of menstruation.
There are two types i.e.

5.9.2.2 Primary amenorrhoea
This is when a girl has not menstruated by 16 years of age. Genitalia and secondary sexual development may be normal or abnormal.

Management

- Reassure patient
- Refer to specialist if the patient does not have menstrual periods by 18 years of age or absence of secondary sexual development.

5.9.2.3 Secondary amenorrhoea
This is a condition where menstruation stops for more than 3 consecutive months. The most common cause of amenorrhoea is pregnancy. Some of the other causes include:

- Stress
- Anxiety
- Significant loss of weight
- Contraceptives e.g. Mini-pill, Depot contraceptive injection; other hormonal medicines such as Danazol (alternative: 17-beta-hydroxy-2,4,17-alpha-pregnadien-20-yno[2,3-D] isoxazole) LHRH analogue.

A vaginal examination and laboratory investigations may help give the diagnosis.

Management
If pregnancy is not present, and amenorrhoea persists for one year or more without obvious disease refer to a Specialist.

5.10.3. Oligomenorrhoea

Definition
This is when the menstrual cycle is more than 35 days. Usually, it has no consequences unless the patient complains of infertility. If infertile for more than one year, refer the patient to a Specialist.

5.10.4. Polymenorrhoea

Definition
This is when the menstrual cycle is less than 21 days. Wrong calculation of menstruation dates could be mistaken for polymenorrhoea. It can also be caused by meno- metrorrhagia. When no abnormalities are detected, the pill may be helpful. Refer to specialist if the pill does not help.

5.10.5. Meno-metrorrhagia

Definition
This is when the menstrual period lasts more than 7 days.
Often there is also excessive blood loss and irregular vaginal blood loss.

Diagnosis
A good history taking (i.e. family planning method used etc.) is very important.

The differential diagnosis includes:
- Abortion
- Carcinoma of the cervix
- Fibromyomata
- Dysfunctional Uterine Bleeding (DUB)
- Ectopic pregnancy

Treatment
- Progestogens treatment
- Fractionated Dilatation and Curettage (D & C) may be needed for older women or non-response to hormone therapy.

5.10.6. Post-menopausal bleeding

The most common cause is carcinoma of the cervix and uterus. A vaginal examination, including speculum, should be done to exclude carcinoma of the

cervix and uterus. Hormones and antibiotics should not be given before this is done.

Refer the patient to a Specialist.

6. RESPIRATORY TRACT DISEASES

Respiratory tract diseases include upper and lower and lower respiratory tract infections or as well as obstructive airway diseases.

6.1. RESPIRATORY TRACT INFECTIONS

6.1.1. Upper Respiratory Tract Infections

Respiratory Tract Infections involve lower and upper or both respiratory tract systems. These include the common cold, bronchitis and pneumonia

6.1.1.1. Common Cold

Description
This is a self-limiting disease caused by viruses and allergies. If it is viral, it is a highly infectious condition
comprising mild systemic upset and prominent nasal symptoms

Clinical Features
Symptoms
- Running nose/nasal congestion
- Cough
- Irritation of the throat
- Fever
- Sneezing

Complications
- Lower respiratory tract infection (see 6.1.2)
- Bronchitis and pneumonia

Treatment
- Analgesics;
  Aspirin, 600mg 3 - 4 times daily or paracetamol, 500mg - 1g orally 3 - 4 times daily in adults, children; paracetamol, 10 - 20mg/kg 3 times daily
- Nasal decongestants
- Cough mixtures may offer symptomatic relief
- Take plenty of fluids

Note: (i) Aspirin is not recommended for children under 16 years.
(ii) Antibiotics are not indicated

Supportive
- Advise patient to take plenty of fluids

6.1.1.2. Laryngotracheobronchitis

Description
This is an inflammation of the larynx, trachea and bronchus following an acute viral respiratory infection.

Clinical features
Symptoms
- Pain in the larynx
- Hoarseness of voice
- Irritating persistent cough
- Shortness of breath
- Fever

Signs
- Stridor
- Persistent or recurrent laryngitis

Treatment
Analgesics in early stages
- Paracetamol, 500mg – 1g orally 3 – 4 times daily in adults, 10 – 20mg/kg orally 3 – 4 times daily in children

Supportive
- Give more fluids and humidification

6.1.2. Lower Respiratory Infections

These conditions include Pneumonia and Bronchitis.

6.1.2.1. Pneumonia
Description
This is an inflammation of the lungs usually caused by
Streptococcus pneumoniae, Mycoplasma pneumoniae and Staphylococcus aureus Haemophilus Influenzae type B and atypical organisms such as Jiroveci pneumonia.

Clinical features
These are usually of sudden onset.

Symptoms

- Fever
- Dry or productive cough
- Chest pain
- Chills
- Breathlessness
- Children may be unable to drink or breastfeed

Signs

- Bronchial breathing
- Drowsiness
- Increased respiration rate
- Cyanosis may be present
- Flaring of nostrils
- Chest indrawing
- Increased pulse rate
- Crepitations
- Breath sounds may be reduced
- Sputum may be "rusty".

Complications

- Septicaemia
- Lung abscess
- Emphysema
- Heart failure
- Meningitis

Diagnosis

This is based on clinical findings but may be supported by radiological examinations which show lobar and bronchial pneumonia.

Treatment

Some patients will need admission particularly if there is cyanosis or complications.

- Benzylpenicillin 1-2MU intravenously 6 hourly for 5 days adults, children 25,000-50,000 units/kg intravenously/intramuscularly in 4 divided doses for 7 days (as soon as the symptoms and respiratory rates are controlled change to oral medication i.e. Amoxycillin 250mg for adults and 125 mg/5ml in children) or
- Ceftriaxone 1g - 2g daily adults, children 20 50mg/kg daily intravenously/intramuscularly for 7 days. if allergic to penicillin or

- Erythromycin 500mg adults, orally 6 hourly for 7 days, children 20-30mg/kg in 4 divided doses for

7 days

- Oxygen is indicated if respiratory distress or cyanosis is present

Non-opiate analgesics; Paracetamol 500mg - 1g orally 3 - 4 times daily adults, children 10-20mg/kg orally 3 - 4 times daily.

Refer early to a specialist if the patient is not rapidly improving with antibiotic treatment.

6.1.2.2. Pneumonia in Children

If a child has a cough or difficulty in breathing, then he/ she may have a respiratory tract infection.

Clinical features

May include:

- Fast breathing
- Chest in drawing
- Stridor in a calm child
- Wheezing

It is important to count the respiratory rate of the child.

If the child is :	*Fast breathing is:*
2 months up to 12 months	***50 breaths per minute or more***
12 months up to 5 years	***40 breaths per minute or more***

Classification

- No pneumonia cough or cold: a child is classified as having no pneumonia cough or cold if there are no signs of pneumonia
- Pneumonia: a child is classified as having pneumonia if there is fast breathing accompanying wheeze or cough Severe pneumonia: a child is classified as having severe pneumonia if there is chest in-drawing or stridor in a calm child.

Treatment

No pneumonia cough or cold:

- If coughing for more than 21 days, refer for assessment,

- If wheezing give oral Salbutamol
- Follow up in 5 days if not improving.

PNEUMONIA

Give an Appropriate Oral Antibiotic

FOR PNEUMONIA, ACUTE EAR INFECTION OR VERY SEVERE DISEASE:

AMOXYCILLIN **Give three times daily for 5 days Amoxicillin**			**ERYTHROMYCIN** **Give four times daily for 5 days 2nd-LINE ANTIBIOTIC-Erythromycin**		
AGE or WEIGHT	TABLET	SYRUP	AGE or WEIGHT	TABLET	**SYRUP**
	250mg	125 mg per 5 ml		250 mg	**125/5 ml**
2 months up to 12 months (4-<10 kg)	1/2	5 ml	2 months up to 4 months 4-<6kg)	1/4	**2.5 ml**
12 months up to 5 years (10-19kg)	1	10 ml	4 months up to 12 months (6-<6kg)	1/2	**5 ml**
			12 months up to 5 years (10-19kg)	**1**	**10 ml**

FOR DYSENTERY:
1st –LINE ANTIBIOTIC:- Nalidixic Acid 2nd –LINE ANTIBIOTIC:- Co-trimoxazole

NALIDIXIC ACID **Give four times daily for 5 days**		**CO-TRIMOXAZOLE** **(Trimethoprim + Sulphamethoxazole)**			
AGE or WEIGHT	TABLET	AGE OR WEIGHT	ADULT TABLET	PEDRIATIC TABLET	**SYRUP**
	250 mg		80 mg Trime-thoprim +400 mg Sulpha-metho-xazole	20 mg Trime-thoprim +100 mg Sulpha- metho-xazole	**40 mg Trime-thoprim 200mg Sulpha-metho-xazole per 5 ml**
2months up to 4 months (4-<6 kg)	1/4	2 months up to 12 months (4-10 kg)	1/2	2	**5 ml**
4months up to 12 months (6-<10 kg)	1/2	2 months up to 5 years (10-19 kg)	1	3	**7.5ml**
12 months up to 5 years (10-19 kg)	**1**				

FOR CHOLERA: *1st-LINE ANTIBIOTIC: - Erythromycin

***Note:* Remember that the most important life-saving interventions for cholera patients is immediate and appropriate rehydration.**

Give Salbutamol
For wheezing with no respiratory distress (chest in-drawing)

SALBUTAMOL **Give three times a day**		
2 months up to 12 months (<10kg)	1/2	1/4
12 months up to 12 months (10-19kg)		

GIVE THESE TREATMENTS IN CLINIC ONLY

- **Explain to the caretaker why the drug is given**
- **Determine the dose appropriate for the child's weight (or age)**
- **Use a sterile needle and syringe. Measure the dose accurately**

Give an Intramuscular Antibiotic

- **For severe pneumonia or severe disease or very severe febrile illness**

FOR CHILDREN REFERRED URGENTLY WHO CANNOT TAKE AN	• **Give first dose intra-muscular Chloramphenicol and refer child urgently to hospital** • **If chloramphenicol is not available, give the first dose of Benzylpenicillin IM and refer urgently**	
IF REFERRAL IS NOT POSSIBLE	• **Repeat the Chloramphenicol injection every 12 hours for 5 days** • **Then change to an appropriate oral antibiotic to complete 10 days of treatment** • **Do not attempt to treat with Benzylpenicillin alone.**	
AGE or WEIGHT	CHLORAMPHENICOL Dose: 40 mg per kg Add 5.0 ml sterile water to vial containing 1000 mg=5.6 ml at 180 mg/ml	**BENZYLPENICILLIN** **To a vial of 600 mg (1,000,000 units):** **Add** **2.1 ml of sterile water=2.5 ml at 400,000**
2 months up to 4 months (4-<6kg)	1.0 ml = 180 mg	**0.8 ml**
4 months up to 9 months (6-<8kg)	1.5 ml = 270 mg	**1.0 ml**
9 months up to 12 months (8-<10kg)	2.0 ml = 360 mg	**1.2 ml**
12 months up to 12 months(10-<14kg)	2.5 ml = 450 mg	**1.5 ml**
3 years up to 5 years (14-19kg)	**3.5 ml = 630 mg**	**2.0 ml**

6.1.2.3. Aspiration pneumonia

More common in new-born babies especially in premature, respiratory distress, chronically ill, chronic aspirators, post vascular operations

Treatment

- Gentamycin, 5mg/kg twice a day or I.M 10 mg once daily
- Ciprofloxacin, 10mg/Kg body weight 3 times daily, the benefit must outweigh the risk but may be used for 5 to 17-year-olds.

6.1.2.4. Atypical Pneumonia

Signs and symptoms of pneumonia plus extra-pulmonary signs such as arthritis, splenomegaly caused by Mycoplasma, Chlamydia, PCP.

Treatment

- Erythromycin 500mg orally QID for 14 days for Chlamydia
- Co-trimoxazole 960mg every 12 hours for 21 days in combination with a steroid i.e. Prednisolone for

PCP starting with 40mg per day and reducing by
5mg every 3 days for adults

- For children above 4 weeks to adults 120mg/Kg body weight in 2 to 4 divided doses for 21 days

6.1.2.5. Obstructive Airway Disease

Obstructive Airway Disease can be upper or lower.

6.1.2.5.1. Upper airway obstruction

The condition is caused by a viral infection or inhaled foreign body. The main symptom is stridor.

When it is caused by viral infection the condition is called Croup. Croup is fairly common and is frightening to parents. Usually, admission is advisable. If the infection has caused epiglottitis, the obstruction may be so severe as to necessitate tracheal incubation and antibiotics may be required.

Treatment

- Chloramphenicol 50 - 100mg/kg intravenously in 4 divided doses daily for 5 days
- Humidified oxygen (30 - 40% concentration)
- Dexamethasone 0.3mg/kg intramuscularly stat, Repeat after 6 hours.

- Naso-tracheal intubation or tracheostomy if an obstruction is severe

Stridor due to Diphtheria

In stridor due to diphtheria, an examination of the throat will reveal a white membrane. Diphtheria infection is uncommon nowadays.

Treatment

- Benzyl Penicillin IM/IV 25,000 - 50,000 units/kg intravenously in 4 divided doses for 5 days

Prevention

- Diphtheria can be effectively prevented by active immunisation in childhood

Stridor due to an inhaled foreign body is usually preceded by sudden chock whilst eating a meal or playing with small objects.

Treatment

- Remove foreign body

Stridor due to inhaled Paraffin

Symptoms

- Smell of paraffin
- Cyanosis
- High respiratory rate
- Tachycardia
- Tachypnoea

Treatment

DO NOT INDUCE VOMITING!

- Give milk
- Hydrate
- Give Oxygen
- Antibiotic prophylaxis with Amoxycillin 125mg/5ml taken 3 times a day.

Advice to patients

- Do not put paraffin in soft drink containers
- Clearly label paraffin containers

6.2. LOWER OBSTRUCTIVE AIRWAY DISEASES

Obstructive airway diseases are a spectrum of diseases characterised by obstruction of the lower airway with asthma and emphysema on either end of the spectrum.

6.2.1. Asthma

Description
This is an acute or recurrent reversible obstructive airway disease characterised by increased responsiveness of the tracheobronchial tree to a variety of stimuli resulting in obstruction of the lower airways. The attacks can be precipitated by allergy, (especially to a cat, horse or other animal hair or pollens), infection or exercise. The obstruction can be reversed by treating with beta-adrenergic agents such as Salbutamol.

Clinical features
Symptoms
- Wheezing
- Difficulty in breathing
- Coughing
- Restlessness

Signs
- Prolonged expiration
- Cyanosis if severe
- Rapid pulse
- Dehydration
- Sticky, clear sputum
- Wheezing

If the pulse is over 120/min, the patient's condition must be regarded as serious and hospital admission is urgent.

Chest X-ray is necessary to exclude cardiac problems, pneumothorax or foreign body in the upper airway.

Treatment
Early vigorous treatment is important. The longer treatment is delayed the more difficult it is to reverse the process.

Mild Cases

These cases are not in acute distress and the pulse rate is usually not above 100/min. They are not cyanosed or dehydrated.

- Salbutamol, 2-4mg orally three times daily
- Salbutamol inhaler 2 puffs stat. Followed by 1 puff 4-6 hourly

Note: Inhaled corticosteroids e.g. Beclomethasone, 2 puffs given 10 minutes after salbutamol inhaler may be used.

The patient must be taught how to use the inhaler. Check that he can use it correctly. If he/she cannot learn, use oral Salbutamol 4mg 3 times daily though. it may cause extrapyramidal symptoms.

Severe cases

The features are:

- Difficulty in breathing
- Sitting up in distress
- Difficulty in talking and drinking
- Pulse over 120/minute
- Exhaustion,
- Dehydration
- Cyanosis
- Silent chest on auscultation

The patient should be admitted to hospital urgently for close monitoring.

The patient should be nursed on a propped up bed and be given a sputum cup.

The pulse and blood pressure should be checked every hour.
If possible, Peak Expiratory Flow Rate (PFR) should be measured hourly.

Treatment

- Intravenous fluids, 3 litres per day; (1 litre 0.9% sodium chloride and 2 litres 5% dextrose)
- 20mmol potassium chloride added to 1L of any of the above fluids in 24 hrs
- Humidified oxygen through a mask, 3 litres/minute
- Nebulised salbutamol 5mg stat given through a nebuliser. Follow this first dose by nebulised salbutamol 2.5mg every 4 hours
- Hydrocortisone, 200mg intravenously 4 hourly
- Start oral prednisolone, 30mg once daily for 5 days

- Aminophylline 250mg IV over 5-10mins followed by a maintenance dose of 100mg (less than 500mg over 24hours) 8 hourly over 24 hours. If the patient has heart disease, liver disease or is taking beta-blockers reduce the dose of aminophylline. Always give oxygen with aminophylline. Patients who have taken oral aminophylline in the last 8 hours should not be given the loading dose.
- Antibiotics. If there is evidence of bacterial infection give an appropriate antibiotic.

Treatment

The asthmatic child
Important clinical signs to record
- Pulse rate
- Respiratory rate
- Degree of breathlessness
- Use of accessory muscles of respiration
- Amount of wheezing
- Degree of agitation
- Level of consciousness

Role of investigations
- Pulse oximetry (SaO2 <92%)
- PEF (>33%)
- CXR (Complications, life-threatening asthma)
- Blood gases (Raised pCO2)

Initial treatment of acute asthma
In children >2 years
- Salbutamol 100mcg inhaler 2 – 10 puffs every 10 to 20 minutes
- Salbutamol via nebuliser if SaO2 < 92% 2.5 - 5 mg every 20-30 minutes
- Ipratropium bromide
- If symptoms are refractory to 2 agonist treatment 250-500 mcg/dose mixed with salbutamol
- Steroid therapy

Steroid tablets Give Prednisolone early in the treatment of acute asthma attacks 20 mg in children 2-5 years, 40 mg in children >5 years.

- Intravenous steroids

For severe exacerbations or children who are vomiting. Hydrocortisone 4 mg/kg 4 hourly

- Inhaled steroids. No evidence of additional benefit.

Can be maintained in children already on long term therapy

Second-line treatment of acute asthma

- In children > 2 years, IV Salbutamol in severe cases with no response to inhaler therapy 15 mcg/kg over 10 minutes; 1-5 mcg/kg/min infusion.

Monitor ECG, Potassium levels.

- In children > 2 years, cont. IV aminophylline; No benefits for mild to moderate asthma, common and troublesome side-effects 4mg/kg over 20 minutes, 1 mg/kg/hour infusion

Monitor: ECG, Potassium levels, Aminophylline serum levels

See Appendix A (Controlling steps).

6.2.2. Emphysema

This is an irreversible obstruction of the airways characterised with the destruction of the alveoli and bronchioles by fibrosis.

Clinical Features

Symptoms

- Severe shortness of breath with slight exertion
- Recurrent coughs
- Slight wheezing
- Barrel chest

Signs

- Barrel chest
- Clubbing of fingers
- Hyper inflated lungs on X-ray
- Air trapping on X-ray

Treatment

Treat causes of exacerbations of the conditions

- Hydrocortisone 200mg intravenously 4 hourly for 24 hours and maintain on oral Prednisolone 30mg on alternate days
- Suction of the fluid from the airway
- Give an appropriate antibiotic i.e. Erythromycin
- 500mg while awaiting sputum results

Supportive

- Give up the habit that caused the emphysema e.g. stop smoking,

- Give oxygen.

Prevention

- Stop smoking
- Reduce industrial exposure
- Wear gas masks

7. CARDIOVASCULAR DISORDERS

7.1. HYPERTENSION

Hypertension is one of the leading public health problems worldwide. It is often asymptomatic, easily detectable, and potentially easily amenable to treatment. Yet, if left untreated it often leads to fatal complications. Since hypertension tends to be asymptomatic, public education about the dangers of hypertension plays a significant role in the overall management of hypertension.

Description

The World Health Organization defines grade 1 hypertension as office blood pressures ranging from 140–159 mm Hg systolic or 90–99 mm Hg diastolic, grade 2 hypertension as pressures of more than 100 mm Hg systolic or 100–109 mm Hg diastolic. The baseline figures do not apply to children, diabetic Mellitus patients, renal patients and pregnant women (hypertension in pregnancy, refer to chapter 5.6). The frequency of hypertension increases with age.

Risk Factors with Adverse Prognosis:

- Black race
- Youth
- Male sex
- Persistent diastolic pressure greater than 115mmHg
- Smoking
- Excess alcohol intake
- Hypercholesterolemia
- Diabetes Mellitus
- Obesity

Classification of Hypertension

The National Heart, Lung, and Blood Institutes classify blood pressure as normal, prehypertension, hypertension stage 1, and hypertension stage 2.

1. Normal (optimal)

Systolic (mmHg)	*Diastolic (mmHg)*
< 120	*< 80*

2. Hypertension

Stage	*Severity*	*Systolic Range (mmHg)*	*Diastolic Range (mmHg)*
Prehypertension		*130-139*	*80 - 89*
I	*mild*	*140 - 159*	*90 – 99*
II	*(moderate-severe)*	*> or = 160*	*> or = 100*

From the Seventh Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure

Aetiology of Hypertension

- Primary (essential) Hypertension
- Secondary Hypertension
- Systolic Hypertension
- Hypertensive Crises (acute hypertension)

7.1.1. Primary Hypertension

This is hypertension for which there is no specific identifiable cause. About 90% of hypertension cases fall under this category.

7.1.2. Secondary Hypertension

This is hypertension due to a specific underlying condition or conditions. Some of the causes include the following:

- Renal Parenchymal Diseases e.g. glomerulonephritis
- Renovascular Diseases e.g. atherosclerotic (mainly older men) and fibroplastic (mostly younger women) diseases.
- Endocrine Diseases e.g. Pheochromocytoma, Cushing's Syndrome.
- Cardiovascular Disease e.g. coarctation of the aorta
- Pregnancy (gestational hypertension)
- Drugs e.g. oral contraceptives, erythropoietin, steroids

7.1.3. Systolic Hypertension

7.1.4. Hypertensive Crises

These are clinical situations associated with blood pressure rising to levels usually above 130 mmHg diastolic. There are two types: hypertensive emergency which is associated with acute end-organ dysfunction (brain, heart and kidneys). In this setting, there is a high risk of causing irreversible damage to the brain, heart or kidneys if blood pressure is not controlled within an hour or so. Hypertensive urgency is the other setting with equally markedly raised BP but without significant signs or symptoms suggestive of end-organ damage. In this setting BP reduction may be gradual over 24 hours. Other terms used in this situation are accelerated malignant hypertension depending on retinal findings during funduscopy examination. If there are haemorrhage and/or exudates on the retina then it is referred to as accelerated hypertension but if there is papilloedema then it is called malignant hypertension. From a therapeutic point of view, both forms are treated in practically the same way.

Clinical Features
Hypertension is usually asymptomatic until when it has caused complications and damage to target organs. At this point, the symptoms are thus associated with the affected organ.

Symptoms
- Palpitations
- Dizziness
- Shortness of breath
- Blurred vision

Signs
- Tachycardia
- Cerebral vascular insufficiency
- Lung crepitations
- Hypertensive retinopathy

Complications
- Atherosclerosis
- Cerebral vascular insufficiency
- Cerebral vascular accident
- Congestive heart failure
- Coronary artery disease

- Peripheral vascular insufficiency
- Dissecting aortic aneurysm
- Hypertensive retinopathy
- Hypertensive nephropathy and renal failure

Management
- To document the presence or absence of end-organ damage.
- To exclude the possibility of a secondary cause of hypertension and other co-morbidities.

Investigations
- Urinalysis
- Fundoscopy
- Electrocardiogram
- Chest x-ray
- Echocardiogram
- Urea, creatinine and electrolytes
- Random blood sugar
- Lipid profile
- Abdominal ultrasound

Treatment
The objective of treating high blood pressure is both to prevent and lower related complications such as strokes, renal failure and heart failure.
Hypertension not responding to treatment should be referred to a specialist for further investigations.

Prevention
- The initial approach to treatment is that of lifestyle modification. i.e. smoking cessation, weight reduction to optimal weight, BMI less than 25, regular exercise, reduction in alcohol intake, dietary modifications (e.g. salt reduction, fat-free diet.).

Drugs
Goals of therapy –blood pressure less than 140/90 mmHg and less than 130/80 mm Hg for those with diabetes and chronic kidney disease.
Stepwise approach, use of a combination of drugs for better effect.

Step 1.
Start with Diuretics (e.g. Amiloride + Hydrochlorothiazide (5/50mg) orally daily) OR

Calcium channel blockers (Nifedipine retard 20mg two times daily orally or Amlodipine 5 -10 mg once daily orally; OR

Angiotensin-converting enzyme inhibitors (Captopril 25-50mg two or three times daily orally, Enalapril 5-20mg once daily orally) . Those who cannot tolerate ACEI may be given Losartan potassium 50-100mg once daily orally.

Step 2.
Use a combination of drugs from different groups (e.g. Diuretic + ACEI, or Calcium channel blocker + ACEI, or, Diuretic + Calcium channel blocker).

Step 3.
Use a combination of Diuretic + ACEI + Calcium channel blocker

Step 4.
If not controlled as above, optimize the dose, add further diuretic therapy
OR
Alpha-adrenoceptor blocker (Prazosin 0.5mg two to three times daily orally – initial should be at bedtime to avoid postural hypotension – then increase to 1-3 mg two to three times daily after three to seven days, maximum daily dose 20mg)
OR
Add beta-adrenoceptor blocker e.g. Atenolol 50-100 mg once daily orally,
OR
Hydralazine 25-50 mg two or three times daily orally.

Beta-blockers are no longer preferred as a routine initial therapy for hypertension, however, can be used in younger people, patients with cardiovascular risk or existing ischemic heart disease, those with contraindications or intolerance to ACEI, ARB as adjunctive drugs to other antihypertensive.

Hypertensive Emergency – very severe to malignant hypertension:

- Start with Labetalol 50 mg IV over at least a minute, repeated after five minutes if necessary, maximum dose is 200mg

OR

- Hydralazine 10 mg IV stat followed by 5 mg IV every 30 minutes until diastolic BP is 110 mm Hg or less
- Frusemide 40-80mg IV may be used as adjunctive therapy as a stat dose.

7.2. CONGESTIVE HEART FAILURE

Description

This is a condition in which an abnormality of cardiac function is responsible for the inability of the heart to meet the requirement of the metabolising tissues.

Causes

Some underlying causes of heart failure:

- Valvular Heart Disease e.g. mitral valve disease
- Viral Myocarditis
- Congenital Heart Disease
- Hypertension
- Cardiomyopathies
- Pericardial diseases
- Ischaemic heart disease
- Arrhythmias
- Thyroid dysfunctions
- Anaemia

Precipitating Causes

- infection including endocarditis
- anaemia
- thyrotoxicosis
- arrhythmias
- systemic hypertension
- pulmonary embolism
- pregnancy

Forms of Heart Failure

- Diastolic
- Systolic
- High output
- Low output
- Right-sided
- Left-sided

Clinical Features

Symptoms

- Fatigue
- Shortness of breath at rest or on exertion

- Orthopnoea
- Paroxysmal Nocturnal Dyspnoea
- Cough
- Anorexia
- Swollen legs
- Abdomen distension

Signs
- Neck vein distension or raised JVP
- Basal crepitations (rales)
- cardiomegaly
- S3 gallop
- Hepatomegaly
- Hepatojugular reflux
- Pulmonary oedema
- Tachycardia
- Oedema
- Pleural effusion
- Ascites

Management
Investigations
- Chest x-ray
- ECG
- Echocardiogram
- Full Blood Count
- Liver function test
- Urea, creatinine, electrolytes
- Urinalysis routine and microscopic
- HIV test

The following tests are not routinely ordered unless there is a clinical indication:
- cardiac enzymes
- Thyroid function tests
- Cardiac catheterization

Treatment
This is divided into 3 parts:
- Treat precipitating cause

- Correct underlying cause e.g. valve replacement in

Mitral valve disease
- Control congestive heart failure state

General Measures
- Restrict physical activities
- Restrict salt and water
- Lifestyle modification (no smoking, no alcohol, -nutrition)

New York Heart Association functional class (NYHA)
1. Class I - Asymptomatic
2. Class II - Symptomatic on moderate exertion
3. Class III - Symptomatic on mild exertion
4. Class IV - Symptomatic at rest

Drugs
1. Class I Asymptomatic
- Most patients do not require medicine but will require lifestyle modifications.

2. Class II
- Captopril 12.5mg to 25mg twice a day orally

OR
- Lisinopril 5 - 10mg daily orally

OR
- Enalapril 5mg to 20mg daily orally (if the patient develops a persistent dry cough replace with Losartan 50mg daily orally.
- Hydrochlorothiazide 25mg daily or oral Frusemide 20 – 40mg daily
- Beta-blockers (Carvedilol 3.125mg twice daily orally, increase the dose at least every two weeks to 25mg twice daily if the patient is over 85kg then maximum dose 50mg twice daily or use Metoprolol 50 – 100mg daily orally)

3. Class III
- Captopril 25mg 2 to 3 times daily OR
- Lisinopril 10mg to 20mg daily OR
- Enalapril 5mg to 20mg daily orally (if the patient develops a persistent dry cough
- Frusemide 40mg – 80mg twice a day orally (monitor potassium levels)
- Digoxin 0.125mg – 025mg daily

- Isosorbide dinitrate 5mg to 10mg twice a day + Hydralazine 25 – 50mg twice daily orally if patient cannot tolerate ACE inhibitors
- Acetylsalicylic Acid (ASA) 75mg once daily

4. Class IV
   - Captopril 25mg 2 to 3 times daily OR
   - Lisinopril 10mg to 20mg daily OR
   - Enalapril 5mg to 20mg daily orally (if the patient develops a persistent dry cough replace with Losartan 50mg daily orally.
   - Frusemide I.V. 40mg – 80mg once or twice a day (monitor potassium levels)
   - Digoxin 0.125mg – 025mg daily
   - Isosorbide dinitrate 5mg to 10mg twice a day + Hydralazine 25 – 50mg twice daily orally if patient cannot tolerate Ace inhibitors
   - Spironolactone 25 – 50 mg once or twice daily orally
   - Acetylsalicylic Acid (ASA) 75mg once daily
   - B-blockers should not be used in Class IV CHF.

7.2.1. Cardiogenic shock

Description
This is an advanced cardiac failure with inadequate peripheral perfusion

Clinical Features
Symptoms
- As above but severe

Signs
- BP less than 90mmHg systolic
- Pulse feeble or non-detectable
- Cold extremities
- Peripheral cyanosis
- Poor urine output
- Comatose

Treatment
- ICU care
- Oxygen
- Dopamine 5-10 micrograms per kg/body weight per minute; I.V. infusion (dilute 400mg in 500ml of 5% Dextrose; infusion rate to be calculated according to body weight)

- Dobutamine 5-10 microgram/kg/min IV infusion
- Acetylsalicylic Acid (Aspirin) 75mg once daily

If BP goes above 90mmHg treat as class IV

7.2.2. Dilated Cardiomyopathy

Description

This is characterised by dilatation of both left and right ventricles and poor contractility.

Some identifiable causes include pregnancy, radiotherapy, chemotherapy, alcohol, association with HIV infection.

Clinical features:

Fatigue

- Signs of left-sided or biventricular failure
- Murmurs
- arrhythmias.

Diagnosis

CXR, ECG, Echocardiography.

Treatment

Treat as in heart failure, see above.

7.2.2.1 Hypertrophic Cardiomyopathy

Description

This is characterised by marked asymmetric hypertrophy of left ventricle without an obvious cause. It is usually inherited in an autosomal dominant manner.

Clinical Features Symptoms

- Chest pains
- Fatigue
- Syncope attack

- Palpitations

Signs

- Arrhythmias
- Systolic murmur on left sternal border
- Sudden death

Diagnosis

- Echocardiography
- ECG
- Holter Monitor

Treatment

Propranolol, 10-40mg 3-4 times a day OR

Atenolol 25-50mg daily, (use with care in people who have asthma. Occasionally, beta-blockers may make the patient feel tired or lethargic, cause sleep disturbance, and pain in the hands and feet during cold weather).

Acetylsalicylic Acid (Aspirin) 75mg once daily.

7.2.2.2 Restrictive cardiomyopathy

Description

This is a condition of restricted ventricular filling resulting in diastolic heart failure.

Clinical Features Symptoms

- Fatigue
- Abdominal distention/ discomfort
- Oedema
- Shortness of breath

Signs

- Elevation of jugular venous pressure with inspiration Hepatic enlargement
- Ascites

- Fourth heart sound

Management

- ECG
- Echocardiogram
- Transvenous endocardial biopsy

Treatment

- There is no specific treatment.
- Cardiac failure (refer to chapter 7.2) and embolic problems should be treated.
- Cardiac transplantation should be considered in severe cases.

7.3. MYOCARDIAL INFARCTION

Description

This is necrosis of a part of the cardiac muscle due to sustained myocardial ischemia of more than 30 minutes and formation of thrombus within the affected coronary artery.

Clinical Features

Symptoms

- Chest pain of greater severity and duration (>30 minutes) than in angina but similar in nature
- Shortness of breath
- Sweating
- Extreme distress
- Abdominal pain

Some infarcts may be painless e.g. in the elderly and diabetics

Signs

- Distress
- Coldness and clamminess of extremities
- Tachycardia
- Raised or lowered blood pressure
- Cyanosis
- Arrhythmias

Complications

- Arrhythmias
- Heart Failure
- Hypotension
- Pericardial effusion
- Systemic embolisation
- Dressler's syndrome (autoimmune syndrome- pericarditis, pneumonia, pleurisy)
- Papillary muscle rupture
- Cardiogenic shock
- Rupture of the ventricular septum or ventricular wall
- Left ventricular aneurysm with Left Ventricular Failure

Management

- Investigations

- ECG
- Cardiac enzymes (Troponin T and I, CPK) – MB fraction
- Echocardiography
- Chest X-Ray
- Urea and Electrolytes (U + E)
- Full Blood Count
- Erythrocyte Sedimentation Rate
- Lipid profile
- Myocardial perfusion scan

Diagnosis requires at least two of the following:
- History of ischaemic-type chest pain
- Evolving ECG changes
- A rise and fall in cardiac enzymes

Treatment
Keep under close observation and refer for management in the intensive care unit.

Drugs
- Oxygen by mask or nasal catheter
- Access to an IV line
- Morphine 5-10mg intravenously at about 1mg per minute
- Glyceryl trinitrate 0.5mg sublingually
- Aspirin 300mg orally to chew stat
- Streptokinase, 1,500,000 units in 100ml of 0.9% saline intravenously over 1 hour (If the presentation is less than 12 hours after onset of pain) (Do not give if there is a stroke or active bleeding in the last 2 months, blood pressure > 200mmHg, surgery or trauma in last 10 days, bleeding disorder, pregnancy, diabetic retinopathy, previous streptokinase or any thrombolytic treatment in the last 5 days to 1 year).
- Heparin, 5000 I.U intravenously stat, then 1000 I.U hourly intravenously for 24hrs for 3-5 days.
- Low Molecular weight heparin Enoxaparin 1mg/kg SC twice daily.
- ACE inhibitors i.e. Enalapril 5- 10mg daily.
- Beta-blockers e.g. Atenolol 50mg daily.
- Antacids e.g. IV Ranitidine 50mg three times daily.
- Laxatives, e.g. Lactulose 15 – 30ml two-three times daily orally.
- Diazepam, 5mg orally daily.
- Aspirin, 75-150mg daily.

- Statins e.g. Simvastatin 10 – 20mg daily orally
- Isosorbide dinitrate, 10mg three times a day

If pain continues;
- Nitroglycerine I.V. infusion 10 – 200 mcg /minute
- Refer for PCI (coronary intervention).

Supportive
- Reassure the patient and carers
- Continuous ECG monitoring
- 24-hour bed rest
- 24-hour Temperature, Pulse and Respiratory rates
- 24-hour blood pressure readings
- Daily 12 lead ECG, Chest X-Ray, cardiac enzymes, and U&E for 2-3 days
- Refer the patient for coronary angiography, refer to a specialist as soon as possible.

Prevention
- Low lipid diet
- Stop smoking
- Regular exercise

7.4. ANGINA PECTORIS

Description
This is chest pain due to myocardial ischemia.

Clinical features
Symptoms
- Chest pain: The pain is central/retrosternal and may radiate to the jaw/or arms.
- Breathlessness

Signs
- Fourth heart sound
- Anxiety
- There may be no signs

Management

- ECG
- Exercise ECG
- Echocardiogram
- Lipid profile
- Myocardial perfusion scan
- Coronary angiography

Treatment
Drugs
- Aspirin, 75 - 300mg orally once daily
- Glyceryl trinitrate, 0.3 - 1mg sublingually, repeated as required or
- Isosorbide dinitrate, 5 - 10mg sublingually, 30 120mg orally in 2 divided doses daily.
- Atenolol, 50 - 100mg orally daily
- Nifedipine (immediate-release) 10 - 20mg orally once or twice daily
- Statin e.g. Simvastatin, 10 – 20mg daily orally

Surgery
- Coronary angioplasty
- Coronary by-pass

Supportive
- Manage co-existing conditions
- Stop smoking
- Weight loss
- Encourage regular exercise

7.5. PULMONARY OEDEMA

Description
Acute left ventricular failure due to various cardiac conditions or due to severe mitral stenosis with pulmonary hypertension

Clinical features
Symptoms
- Breathlessness
- Wheezing
- Profuse sweating
- Productive cough
- Bloodstained sputum

Signs

- Paroxysmal dyspnea
- Anxiety
- Bloodstained sputum
- Tachypnoea
- Peripheral circulatory shut down
- Crackles
- Wheezing

Diagnosis

Investigations

- Arterial gases
- Pulse oximetry
- Chest X-Ray
- Central venous pressure
- ECG
- Echo
- Cardiac enzymes

Treatment

The patient should be placed in a sitting position.

Medication therapy

- Frusemide, adults: initially 40mg to 120mg I.V. Stat, thereafter continue Frusemide 20mg-daily orally or 40mg on alternate days
- Morphine 5mg to 10mg I.V. slowly
- Oxygen 60% via a mask
- Glycerol trinitrate, 0.3 - 1mg sublingually, repeated as required
- Underlying conditions should be treated.

7.6. RHEUMATIC FEVER

Description

This is an inflammatory disease that occurs in children and young adults (5 - 15 years) as a result of infection with group A streptococcus. It affects the heart, skin, joints and central nervous system. Pharyngeal infection with group A streptococcus may be followed by the clinical syndrome of rheumatic fever. This is thought to develop because of an autoimmune reaction triggered by the infective streptococcus and not due to direct infection of the heart or the production of a toxin.

Clinical features
Revised Jones criteria for the diagnosis of rheumatic fever

Major
- Carditis
- Polyarthritis
- Sydenham's chorea
- Erythema marginatum
- Subcutaneous nodules

Minor
- Arthralgia
- History of rheumatic fever
- Fever
- Increased P-R interval on ECG
- Raised ESR
- Increased C-reactive protein

Evidence of streptococcal infection
Raised ASO titre (or increased titre of other specific antistreptococcal antibodies) Positive throat culture

Diagnosis
Investigations
- Throat swab
- Serology
- ESR
- ECG
- Echocardiography

Diagnosis is made based on two or more major criteria or one major plus two or more minor criteria plus evidence of antecedent streptococcal infection.

Treatment
Drugs
- Benzathine penicillin 0.6–1.2 mega units IM stat

OR

- Phenoxymethylpenicillin 500mg orally 4 times daily for 7 days. For recurrences, 250mg daily until the age of twenty or for 5 years after the latest attack

OR

- Erythromycin, 250 – 500mg orally 4times daily for 7 days. For recurrences, 125 – 250mg once daily until the age of twenty or for 5 years after the latest attack
- Prednisolone 1 – 2mg/kg per day divided into 4 equal doses for 10 days (in severe carditis)

Chronic rheumatic heart disease

More than 50% of those who suffer acute rheumatic fever with carditis will later develop chronic rheumatic valvular disease predominantly affecting the mitral and aortic valves.

Complications

- Congestive cardiac failure
- Pulmonary oedema

Management

Investigations

- Chest X-Ray
- ECG
- Echocardiography

Treatment

- Treat underlying complications
- Give prophylaxis against recurrent rheumatic fever with Benzathine Penicillin 1.2 – 2.4 MU monthly for life
- Give prophylaxis against infective endocarditis

Refer

- For further evaluation, if the patient has significant heart murmurs
- All patients with increasing cardiac symptoms.

7.7. CARDIAC ARRHYTHMIAS

Description

This involves the disorders of cardiac impulse formation, automaticity, impulse conduction, heart rate and abnormal ectopic activity.

Clinical features

Symptoms

- Palpitation
- Missing heartbeats
- Dizziness and syncope
- Difficulty in breathing

Signs

- increased or decreased pulse and heart rate (more than 100 or less than 60/min)
- Irregular pulse and heart rate
- Features of heart failure
- Bradyarrhythmias (sinus bradycardia, sinus node dysfunction, atrioventricular blocks), heart rate <55/min
- Tachyarrhythmias (atrial fibrillation and flutter, supraventricular and ventricular tachycardia). Premature atrial and ventricular contractions.

Investigations

- ECG
- Ambulatory ECG monitoring (Holter)
- Serum electrolytes level
- Echocardiography
- Stress ECG test, TFTs

Management

Bradyarrhythmias:

- Sinus bradycardia – no treatment required unless symptomatic, remove offensive drugs (e.g. B-blockers, digoxin) if symptomatic –Atropine 0.6mg IV or cardiac pacing
- Sinus arrhythmia – no treatment needed
- Atrioventricular block 1st degree – treat underlying causes (carditis, drug toxicity).
- Atrioventricular block 2nd degree – may require cardiac pacing, refer to a specialist
- Atrioventricular block 3d degree – cardiac pacing, refer to a specialist.

Tachyarrhythmias:

- Supraventricular tachycardia ‡
  Heart rate 150–220/min on ECG narrow QRS complex strictly regular tachycardia – start with vagal stimulation (unilateral carotid massage, Valsalva manoeuvre), the drug of choice is Adenosine 6mg IV push, if no

response, give 12mg IV push. Other drugs – Verapamil 2.5-5.0mg IV slowly. Diltiazem 15-20mg IV over 2 min. Propranolol 1-2 mg IV bolus. Refer to a specialist.

- Ventricular tachycardia
  Heart rate 130-180/min, on ECG wide QRS complex not strictly regular tachycardia– if the patient's condition is unstable – defibrillate at 50-100 + 200.
- If the patient is stable, pharmacological treatment: Amiodarone 300mg IV over 10 min, followed by infusion at 1mg/min for 6 hours; Lignocaine 100mg IV bolus, followed by infusion of 4 mg/min for 30 min, 2 mg/min for 2 hours, then 1 mg/min.

In case of multifocal Ventricular tachycardia use Magnesium sulfate1-2 g IV.

Correct reversible causes: hypokalemia, digoxin toxicity.

Atrial fibrillation:

- Rate control can be achieved by Digoxin 0.125-0.25 mg once or two times daily orally, Verapamil 40 to 80mg three times daily orally, Diltiazem 60mg three times daily orally
- Amiodarone 200mg three times daily orally 1st week, then reduce to 200mg two times daily (maintenance dose 200 to 400mg daily)
- Electrical cardioversion (refer to a specialist)
- Anticoagulation therapy (to reduce the risk of systemic embolization) – Aspirin 75-150mg once daily orally, Warfarin 2.5-10mg once daily orally (to maintain INR 2,5 to 3,5).
- Use Warfarin, if no INR available, Aspirin 75-150mg orally once daily.

Premature atrial contractions
No treatment required. If symptomatic: B-blockers (e.g. Propranolol 20-40mg orally 2-3 times daily, Verapamil 40-80mg orally 2-3 times daily.

Premature ventricular contractions
No treatment if asymptomatic, if symptomatic or frequent – Beta-blockers (Propranolol 40-80mg three times daily orally), Amiodarone 200mg three times daily orally for 5-7 days, then reduce to 200mg two times daily (maintenance dose 100-200mg daily).
Monitor for possible side effects: Thyroid function test, LFTs, consult ophthalmologist and CXR once a year.

7.8. INFECTIVE ENDOCARDITIS

Description
This is a microbial infection of the endocardium, which may result in valvular damage, myocardial abscess, or mycotic aneurysm.

Causes
Streptococcal species (especially Streptococcus viridans),
Staphylococci, HACEK group, Enterococci.

Predisposing factors
Preexisting valvular disease, congenital heart disease, dental and surgical procedures, intracardiac devices (prosthetic valves, pacemaker), intravascular catheters, intravenous drug abuse.

Can be acute and subacute.

Clinical features
Symptoms
- Fever
- Night sweats
- Arthralgia
- Malaise
- Weight loss
- Dyspnea

Signs
- Fever
- Peripheral stigmata (splinter haemorrhages, Osler's nodes, Janeway lesion, Roth's spots)
- Pallor and jaundice
- Heart murmurs
- Features of heart failure
- Embolic phenomena
- Splenomegaly
- Hematuria

Diagnosis
Duke's criteria:
1.Criteria for Infective Endocarditis
    A. Two major criteria or
    B. One major and three minor or
    C. Five minor criteria

2.Major criteria
    A. Positive blood culture X >2 (typical microorganisms for infective endocarditis)

B. Positive Echocardiographic study (vegetation on the valves, wall abscess, new valve regurgitation)

3.Minor criteria

A. Predisposing heart condition or injected drug user
B. Febrile syndrome
C. Vascular phenomena (embolism, CNS haemorrhage, conjunctival haemorrhage, Janeway lesion)
D. Immunologic phenomena (glomerulonephritis, Rheumatoid factor, Osler's nodes, Roth's spots, false-positive VDRL test)
E. Microbiologic evidence (positive blood culture, but not typical microorganisms)
F. Echocardiography: suggestive but not positive for infective endocarditis

Management

Investigations

- Blood culture
- Echocardiography
- FBC
- Urinalysis and microscopy
- U/E, LFTs

Treatment

1. Appropriate antibiotics: Penicillin G 10-20 MU /day IV in divided doses (4 times)or Ampicillin 8-12 g/day IV for 4 weeks and Gentamycin 1 mg/kg (up to 80 mg) 3 times IV daily 2-4 week. If Staphylococcus aureus: Oxacillin or Vancomycin IV
2. Bed rest
3. Treat heart failure and arrhythmias
4. Surgery - valvular replacement (indications: refractory heart failure, uncontrolled infection, fungal infections with large vegetation >10mm in size, recurrent systemic embolism, suppurative pericarditis, mycotic aneurysm or rupture of sinus of Valsalva)

Prophylaxis

Conditions in which prophylaxis is recommended:

1. Prosthetic cardiac valves

2. Previous infective endocarditis
3. Certain types of Congenital Heart Diseases (unrepaired cyanotic CHD, complete repair of CHD with prosthetic material or device for first 6 months; repaired CHD with the residual defects at the site of prosthetic valve or patch)
4. Cardiac transplantation with valvulopathy No prophylaxis is recommended for most dental, GIT and GUT procedures, with acquired valve disease, hypertrophic cardiomyopathy, a pacemaker or coronary by-pass surgery.

Prevention
Good oral hygiene, regular dental review
Antibiotics for prophylaxis, 1 hour before procedure:
Oral:
Amoxycillin 2 g (adult), 50 mg/kg (children) or
Cephalexin 2g (adult), 50 mg/kg (children) or Azithromycin 500 mg (adult), 15 mg/kg (children)

Parenteral
Amoxycillin 2 g IM/IV (adult), 50 mg/kg (children)
Cefazolin or Ceftriaxone 1 g IM/IV (adult), 50 mg/kg
(children)
Clindamycin 600 mg IM/IV (adult), 20 mg/kg (children).

7.9. CARDIOPULMONARY RESUSCITATION AND ADVANCED CARDIAC LIFE SUPPORT

7.9.1. Basic life support (BLS)

Goals of resuscitation – to maintain cerebral perfusion until the cardiopulmonary function is restored.

Important change: A-B-C changed to C-A-B (circulation first).

1. Check responsiveness by gently shaking the patient.
2. Call for help, fetch defibrillator and oxygen and airway adjuncts, resuscitation kit.

3. Position the patient on a firm flat surface.
4. Open the patient's airway and assess for the presence of respiration.
5. Check circulation (palpate for a carotid pulse), if not present start CPR.
6. Initiate chest compressions (position both hands over the lower part of the sternum and compress at the rate of 30 compressions/ 2 breaths). At the rate of 100 chest compressions/min, depth in adults 2 inches, infants 4 inches.
7. Once the patient is intubated, ventilation can be at a rate of 12-15 per minute without pausing for compressions.

7.9.2. Advanced cardiac life support

Advanced cardiac life support (ACLS) is an extension of BLS and usually is implemented by a team leader with the use of necessary facilities.

1. IV access with IV fluid e.g. before NS
2. Attach defibrillator-monitor.
3. Assess cardiac rhythm.

If Ventricular tachycardia or ventricular fibrillation:

- Defibrillate
- Epinephrine 1mg IV push, repeat every 3-5 minutes
- Consider antiarrhythmic drugs – Amiodarone 300mg IV push or Lignocaine 1.0-1.5mg/kg IV push
  OR
  Magnesium sulfate 1-2g IV push

Identify and treat reversible causes 4 "T": Tension pneumothorax, Thrombosis (coronary and pulmonary), Tamponade cardiac, Toxins; 4 "H": Hypovolemia, Hypoxia, Hypothermia, Hypo/Hyperkalemia; Acidosis.

If asystole:

- Continue CPR
- Epinephrine 1 mg IV push every 3-5 minutes until there is a cardiac rhythm or CPR is stopped
- Treat reversible causes (see above)
- Atropine is no longer recommended for asystole and PEA (Pulseless Electrical Activity).

- Termination of resuscitation: terminate resuscitation after 5 cycles of CPR and defibrillation, also if the prognosis of the underlying condition is poor.

8. MALIGNANCIES

8.1. LEUKAEMIAS

Description
These are diseases characterised by the proliferation of a single malignantly transformed progenitor cell in the haemopoietic system. Acute leukaemia if untreated has a rapidly fatal course. Chronic leukaemia has a more prolonged course but patients invariably die from it. Leukaemia is classified according to the morphological cell type involved and the speed of evolution of the disease:

- Acute Lymphoblastic Leukaemia (ALL)
- Acute Myelogenous Leukaemia (AML)
- Chronic Lymphatic Leukaemia (CLL)
- Chronic Myeloid Leukaemia (CML)

8.1.1. Acute Lymphoblastic Leukaemia (ALL)

Description
The proliferation of lymphoid cells in the bone marrow.

Clinical features
Any age may be affected but commonly 4 to 8-year-olds. Male to female ratio is 1:1.

Symptoms
Fatigue, headache, palpitations, bleeding into skin, nose mucous membrane, infections such as sore throat pneumonia and bone pain.

Signs
Bone tenderness, splenomegaly, lymphadenopathy, pallor and bruises.

Signs include pallor, bruising, petechial haemorrhage, bleeding gums and gum hypertrophy, lymphadenopathy, splenomegaly and/or hepatomegaly, haemorrhage in the optic fundi. Hard enlarged testicles indicate that the testes have become infiltrated with leukaemic tissue.

Opportunistic infections do occur.

Management

Diagnosis

a) Full blood count which shows a normocytic/normochromic anaemia

b) The white cell count may be normal or raised (normal 4 -11 x 10^9/L 50,000 or more

c) The platelet count is usually reduced (normal 150 - 4000 x 10^9/L) below 150 /9/L

d) Characteristic leukaemic cells in blood and bone marrow

e) The CSF prepared sediment may show blast cells if meningeal leukaemia is present.

f) The peripheral smear show lymphoblast.

Treatment:

Supportive care

- Blood and platelet transfusion, I.V.
- Appropriate antibiotics at the first sign of infection
- Correction of dehydration, treatment of hyperuricemia arising from chemotherapy with Allopurinol and I.V. fluids
- Barrier nursing, prophylactic antibiotics e.g. Co-trimoxazole to prevent pneumocystis carinii (jiroveci)
- Emotional support

Chemotherapy

This is done in 3 steps:

i) Remission induction:

Vincristine 2mg/m^2 I/V every 1-2 weeks

Prednisolone 60mg/m^2 daily

Daunorubicin 40mg-75mg/m^2 daily

ii) CNS prophylaxis:

Intrathecal Methotrexate 5mg/kg weekly Cranial irradiation.

iii)Maintenance chemotherapy:

Mercaptopurine (daily)100-200mg daily

Children 2.55/kg body weight per day.

Methotrexate *Children* 12.5mg/Methotrexate (weekly)

Vincristine and prednisolone (monthly) For 2 –3 years.

Prophylaxis

Methotrexate	*Danorubicin*	*Ara-c*
10mg	*10mg*	*20mg*
12.5mg	*12.5mg*	*25mg*
15mg	*16mg*	*30mg*

Bone marrow should be performed in all suspected cases and will show more than 5% lymphoblasts.

A lumbar puncture may be done. If meningeal leukaemia is suspected this will show blasts in the CSF.

Relapse is common in blood, CNS or testis.

Prognosis
Is better in children where the cure rates for children are 70 – 90%; it is very poor in adults where 20% cure rates have been recorded. Worse prognosis in blacks.

8.1.2. Acute Myelogenous Leukaemia

Description
The proliferation of myeloid cells in the bone marrow and blood. This has got unfavourable prognosis and increases with age.

Clinical features
1. Marrow failure causes
    a. Anaemia
    b. infection often positive bleeding from the gums
    c.disseminated intravascular coagulation

2. Leukaemic infiltration
    a. bone pain, tender sternum
    b.CNS signs (cord compression, cranial nerve lesions)
    c.Gums hypertrophy, testes, orbit ((proptosis)

d.Hepatosplenomegaly
e. Lymphadenopathy
f. Skin and peri-anal involvement

3. Constitutional features
a. malaise
b. weakness
c. fever
d. polyarthritis

Management
Diagnosis
i) The white cell count is variable
ii) Bone marrow biopsy – diagnosis depends on this.
Treatment
Chemotherapy
1. Very intensive. The main drugs used include daunorubicin, cytosine 100-200mg per square meter for 5 days I/V or subcutaneous. arabinoside and thioguanine 2mg/kg body weight daily.

Long term maintenance is generally considered to be less effective

2. Bone marrow transplant (BMT) – allogeneic transplant is possible in acute conditions.

Intrathecal prophylaxis.

Supportive care
i) Blood and platelet transfusion
ii) Barrier nursing
iii) I.V. antibiotics

8.1.3. Chronic Lymphatic Leukaemia (CLL)

Description
This is the infiltration of the bone marrow and blood relatively mature lymphocytes common in people above 60 years of age.

Clinical features

Symptoms include:

i) Bleeding
ii)Weight loss
iii)Infection
iv)Anorexia
v)Lethargy
vi)Fever and sweating

Signs include:
i) Enlarged, rubbery, non-tender nodes
ii)Hepatosplenomegaly
iii)Pallor

Complications
i) Auto-immune haemolysis
ii) Infection - bacterial or viral (mostly of the respiratory tract).
iii) Bone marrow failure

Diagnosis
i) FBC Mild anaemia – normocytic/normochromic type.
ii)The white cell count is > 15 x 109/L of which more than 60% are lymphocytes
iii)The platelet count is usually normal in the early stages
iv)Bone marrow shows mainly more mature lymphocytes

Treatment
Chemotherapy
This is not always needed but may postpone marrow failure. Chlorambucil 0.1–0.2mg/Kg body weight orally daily is used to decrease the lymphocyte count. Prednisolone 60mg/m^2

Steroids are used if there is auto-immune haemolysis.

i) Transfusions
ii) Prophylactic antibiotics

8.1.4. Chronic Myeloid Leukaemia (CML)

Clinical features
Description
This is the infiltration of the bone marrow and blood with relative mature myeloblasts.

It accounts for 15% of leukaemias and often occurs in middle age of 45 - 55 with a slight male predominance.

Symptoms
a) Symptoms of anaemia
b) A large spleen (swelling of the abdomen)
c) Priapism
d) Gout
e) Sweating, fever and loss of weight
f) Bruising

Signs
Pallor, splenomegaly, hepatomegaly, bleeding into the mucous membrane and there may be evidence of infection.

Management
Diagnosis
i) FBC which shows raised WBC (often .100 x 109/L)
ii) Low Hb
iii)Platelets may be raised normal or reduced.
v)Abundance of neutrophils in the blood film but the whole spectrum of myeloid precursors including a few blast cells
vi)Bone marrow may present with the whole spectrum of myeloid precursors including a few blast cells.
Mega karyocyte may be abundant.
vii)Philadelphia chromosome on chromosome preparation
viii)Levels of Vitamin B12 and B12 binding proteins are elevated

Treatment
i) Treatment of choice is Hydroxyurea 30-50mg/kg body weight in two divided doses or Busulfan 2-4mg daily

ii) Allogeneic bone marrow transplant

iii) Splenectomy can reduce discomfort, radiation to the spleen may reduce discomfort.

Prevention

Avoid predisposing factors such as radiation chemicals e.g. Benzene and other drugs like Phenylbutazone.

8.2. LYMPHOMAS

Description

Lymphomas are malignant tumours of the lymphoreticular system and are classified into Hodgkin's disease and non- Hodgkin's lymphoma.

8.2.1. Hodgkin's Disease (HD)

The lymphoid tissue on biopsy shows malignant lymphoid cells with Dorothy Reed Sternberg cell.

Classification

- Nodular Lymphocyte predominant HD
- Classic HD
  1. Nodular Sclerosing
  2. Mixed Cellularity
  3. Lymphocyte depleted
  4. Lymphocyte rich

Symptoms and Signs

- Fever, weight loss, and night sweats
- Loss of appetite
- Pruritis
- Pallor
- Pain in the infiltrated tissue (Alcohol-induced)
- Enlarged lymph nodes
- Hepato-splenomegaly
- Weight loss.

Diagnosis

- History and physical examination
- Excision biopsy
- FBC, ESR, LDH, LFTs, U/Es
- CXR
- Abdominal Ultrasound
- CT chest abdomen and Pelvis
- HIV and CD4 count

For advanced-stage disease bone marrow aspiration and trephine

Treatment
The choice of treatment is determined by the stage of the disease. It consists of a combination of radiotherapy and chemotherapy.

Stage I & II – 4 cycles of chemotherapy plus involved-field radiation therapy.

Stage III & IV – 6 – 8 cycles of combination chemotherapy plus radiotherapy for residual localized disease.

Chemotherapy ABVD regimen:
- Doxorubicin 25mg/m^2 D1 & 15 IV
- Bleomycin 10 units/m^2 D1 & 15 IV
- Vinblastine 6mg/m^2 D1 & 15 IV
- Darcabazine 375mg/m^2 D1 & 15 IV Repeat every 28 days

COPP Regimen

Cyclophosphamide	600 mg/m^2	Days 1 and 8
Oncovin	1.4 mg/ m^2	Days 1 and 8
Procarbazine	100 mg/m^2	Days 1-10
Prednisolone	40 mg/m^2	Days 1-14

8.2.2. Non-Hodgkin's Lymphoma

This is a heterogeneous group of lymphoreticular malignancies. These lymphomas may be associated with HIV/ AIDS.

Symptoms and signs
See under Hodgkin's disease.

Classification
- Low-grade Aggressive
- Highly Aggressive

Diagnosis
- As for Hodgkin's Lymphoma HIV and CD4 count
- Conduct immunohistochemistry and flow cytometry where possible
- Lumbar puncture for the highly aggressive

Treatment

Low-grade Stage I & II - curative radiotherapy or watchful waiting, if they are HIV negative.

Low-grade Stage III & IV - watchful waiting or with single or combination chemotherapy and radiotherapy

Single agents

- Fludarabine 25mg/m2 IV D1-5 for every 28 days OR
- Chlorambucil 2-4mg orally daily or 30-60mg orally every 2 weeks.

Combination chemotherapy regimens:

- CVP
- CHOP

Aggressive Disease

Stage I & II - 3 cycles CHOP Chemotherapy PLUS consolidation radiotherapy to 30 - 36Gy

Stage III & IV - CHOP chemotherapy 6 -8 cycles and radiotherapy to local residual disease

Regimens

CHOP

- Cyclophosphamide 750mg/m2 D1 IV
- Doxorubicin SOmg/ m2 D1 IV
- Vincristine 1.4mg/ m2 D1 IV (maximum of 2mg)
- Prednisolone 100mg PO D1 - 5

Repeat every 21 days

CVP

- Cyclophosphamide 400 - 600mg/ m2 D1 IV
- Vincristine 1.4mg/ m2 D1 IV (maximum of 2mg)
- Prednisolone 100mg PO D1 - 5

Repeat every 21 days

Highly Aggressive NHL

8.2.3. Burkitt's Lymphoma

Description

This is a highly aggressive NHL, which presents mainly in children, with a jaw swelling, abdominal mass, ovarian mass and CNS involvement.

Diagnosis

i) History and physical examination
ii) Biopsy of the tumour plus Lymph node
iii) FBC, ESR, LFTs, U/Es, LOH
iv) Bone Marrow Aspiration and/ or Trephine biopsy
v) CXR
vi) CT scan of the abdomen and pelvis
vii) HIV testing and CD4 especially in adults
viii) CSF examination is done at the first intrathecal treatment

Treatment

This is associated with tumour lysis syndrome, so IV pre-hydration and allopurinol must be given before starting chemotherapy

Regimen

Patients with localised disease receive 3 cycles of CODOXM.

Patients with multiple site involvements are treated with CODOX-M alternating with IVAC and intrathecal therapy for 4 cycles each.

CODOX-M and CODOX-M alternating with IVAC

CODOX-M

- Cyclophosphamide 800mg/m2 D1 and 200mg/m2 D2-5 IV
- Vincristine 1.5mg/m2 D1 IV (max 2mg)
- Doxorubicin 40mg/m2 D1 & 8 IV
- Methotrexate 1.2g/m2 continuous IV infusion on D10, then 240mg/m2 IV each hour over 23hrs

- Folinic Acid 192mg/m2 IV D11 starting from the 12th hour of Methotrexate infusion, then 12mg/m2 IV every 6hrs for next 48hrs
- G-CSF support starting on day 13 until G-CSF (Filgrastim) support starting on day 13 until granulocyte count is (Filgastrim) above 1X109/L granulocyte count is above 1X109/L

CNS prophylaxis

- Cytarabine 30mg/m2 IT D1 & 3
- Methotrexate 12mg/m2 IT D15 (Not more than 20mg total dose)
- Hydrocortisone 20mg/m2 D1, 3 and 15
- Folinic Acid

IVAC

- lfosphamide 1.5g/ m2 IV D1 - 5
- Etoposide 60mg/ m2 IV D1 - 5
- Cytarabine 2g/ m2 IV every 12hrs for D1 and 2
- Filgrastim start on D7 till absolute granulocyte count is over 1x 10^9/ L.

CNS prophylaxis

- Methotrexate 12mg/ m2 IT D5
- Folinic Acid 15mg orally stat on D6.

8.3. CARCINOMA OF THE BREAST

Description

This is a malignancy of the breast and there are various types.

Clinical features

Symptoms and Signs

1. Lump in the breast
2. Nipple discharge
3. Change in breast size
4. Nipple inversion
5. Skin changes - orange-like appearance (*'peau d' orange'*)
6. Axillary, Infraclavicular and supraclavicular lymphadenopathy

Diagnosis

i) History and physical examination
ii) Bilateral Mammography
iii) Core biopsy or excision biopsy, do oestrogen and progesterone receptor status and if possible *Her2 neu* status

iv) CXR
v) FBC and ESR, LFTs, U/Es, LDH
vi) For patients with raised ALP, LDH S/S of bone or liver involvement do ultrasound of abdomen and bone scan.

Treatment

This depends on the stage of the disease.

i) Early Breast cancer
   - Breast-Conserving Treatment: wide local excision with axillary dissection, then Adjuvant Radiation therapy and/or chemotherapy
   - Modified Radical Mastectomy with an axillary dissection. Adjuvant Chemotherapy and radiotherapy will depend on the histopathological findings (stage).

ii) Locally Advanced Breast Cancer – must be treated with all modalities (Surgery, Chemotherapy and Radiation therapy)

iii) Metastatic Breast Cancer – Chemotherapy and where indicated hormonal therapy.

Treatment Regimens

1. Chemotherapy
   - AC – Doxorubicin 60mg/m^2 IV D1 and Cyclophosphamide 600mg/m^2 IV D1 repeat every 21 days for 4 cycles

   OR
   - CAF – Oral cyclophosphamide 100mg/m^2 D1 – 14, Doxorubicin 30mg/m^2 IV D1 and D8, and 5 Fluorouracil 500mg/m^2 IV D1 and D8. Repeat every 28 days for 6 cycles

   OR
   - FAC – 5 Fluorouracil 500mg/m^2 IV D1 &8, Doxorubicin 50mg/m^2 IV D1, and cyclophosphamide 500mg/m^2 IV D1. Repeat every 21 days for 6 cycles

   OR
   - CMF - Cyclophosphamide 100mg/m^2 PO D1 – 14, Methotrexate 40mg/m^2 IV D1 & 8, and 5 Fluorouracil 600mg/m^2 IV D1 & 8 every 28 days for 6 cycles OR
   - TAC – Docetaxel 75mg/m2 D1 IV, Doxorubicin 50mg/m2 IV D1, and Cyclophosphamide 500 mg/m2 01 IV every 21 days for 6 cycles.

2. Radiotherapy - usual dose in the curative setting is 2Gy per fraction to 50Gy with a boost of 2Gy per fraction to 12 - 16Gy. Radiotherapy can also be used in the treatment of painful local bone metastasis, spinal cord compression, brain metastasis and for local disease on the chest wall etc.

8.4. CERVICAL CANCER

Description
This is a cancer of the cervix.

Clinical features
Symptoms and Signs
- Irregular PV bleeding
- Per vaginal discharge iii) Lower abdominal pain
- Backache
- Dyspareunia
- Nodule, ulcer, or fungating growth

Complications
- Anaemia
- Sciatic pain
- Backache
- Incontinence of urine or faeces
- Sepsis
- Uraemia

Diagnosis
1. History and physical examination
2. Cervical biopsy must be taken
3. CXR
4. FBC, U/Es, LFTs HIV and CD4 count
5. IVP
6. Abdominal Ultrasound (to rule out hydronephrosis and metastases in the abdomen)
7. EUA, cystoscopy and proctoscopy optional

Treatment

This depends on the stage of the cancer

i. Surgery for stage IB1 or less. Note surgery should not be done in cases with stage IB2 and above.
ii. Chemoradiation for stages IB2 - IVA

There is no role of chemotherapy alone in stage IB2
- IVA and therefore all these patients need to be referred to the Cancer Diseases Hospital via UTH Radiotherapy - 2Gy per fraction to 46 - 50Gy of External beam radiation therapy (EBRT) with Brachytherapy to a total of 75 - 85GY to point A. chemotherapy is given concurrently with the radiation using Cisplatinum 80mg/m2 IV 3 weekly.

8.5. OVARIAN CANCER

Description
These are malignancies of the ovaries.

Classification

1. Epithelial Ovarian Cancer
2. Germ Cell Ovarian Cancers
3. Stromal Tumours

The most common of these are the epithelial ovarian cancers. The prognosis depends on the stage at diagnosis and the histologic type.

Clinical Features

70 - 800/o are diagnosed at an advanced stage. Early-stage disease is difficult to diagnose due to lack of specific signs and symptoms. Have a high index of suspicion. Symptoms and signs: pelvic mass, lower abdominal pain, abdominal distension, and Ascites.

Diagnosis

- History and physical examination
- Ultrasound of abdomen and pelvis CT scan abdomen and pelvis
- CXR
- FBC, U/Es, CA 12S
- Definitive diagnosis confirmed by Histology

Treatment

1. Primary treatment is surgery maximal de-bulking aiming for less than 2cm of residual disease.
2. Adjuvant Treatments: This requires a thorough pathologic staging and selection of adjuvant therapies is dependent on stage and grade of cancer (For staging readers are referred to the latest FIGO and AJCC cancer staging manual).
   i) Early Stage low risk - stage IA and 1B grade 1 &2 No further treatment after maximal surgery
   ii) Early Stage High Risk - Stage IA and 1 B with grade 3 or clear cell histology, stage IC and Stage II disease; these require Carboplatin AUC 5 - 7 IV and Paclitaxel 175mg/m2 IV 21-day cycles for 3 - 6 cycles,
   OR
   Cisplatinum 75mg/m2 IV and Paclitaxel 735mg/m2 IV infusion over 24 hrs (Neurotoxic)
   OR
   Carboplatinum and Cyclophosphamide 750mg/m2 IV.
   iii) Advanced Disease stage

As for early-stage but for 6 - 8 cycles. Interval de-bulking as indicated.

8.6. ENDOMETRIAL CANCER

Description
These are cancers that arise from the Uterus.

Classification

1. Epithelial – Adenocarcinoma, adenosquamous, papillary serous
2. Stromal tumours – Sarcomas of the uterus

Prognosis and adjuvant treatment are dependent on the grade, histology and stage of cancer.

Clinical Features
- Postmenopausal bleeding

Diagnosis
- History and physical examination
- Endometrial biopsy
- CXR
- Abdominal and pelvic ultrasound
- FBC, U/Es, LFTs

Treatment
1. Primary treatment is surgery TAH and BSO plus or minus pelvic lymphadenectomy. For patients who refuse surgery or are medically inoperable curative radiotherapy is indicated.
2. Adjuvant treatments depend on stage, grade, and histology; Radiotherapy with either vaginal brachytherapy alone or in combination with external beam radiation therapy at 2Gy to 50Gy.
3. Systemic therapy includes:

d) Hormonal Therapies with Medroxyprogesterone acetate 400 – 800mg PO twice weekly, Tamoxifen 20mg daily
e) Chemotherapy TAP i.e. Cisplatinum 50mg/m^2 IV, Adriamycin 45mg/m^2 iv D1 followed by Paclitaxel 160mg/m^2 repeat every 21 days OR carboplatin and Paclitaxel as for Ovarian cancer.

8.7. PROSTATE CANCER

Description

This is a malignancy of the prostate gland. The patient is usually elderly but the condition may occur in young men.

Clinical features

i) Prostatism - hesitancy, poor stream, frequency in passing urine, dribbling of urine, and urinary retention

ii) Bone pain due to metastases

Diagnosis

i) History and physical examination including a DRE

ii) PSA any value above 4mg/mL requires core biopsy

iii) Core biopsy i.e. 6 cores from each side and well labelled. The pathologist must give a Gleason Score

iv) FBC, U/Es and creatinine, CMP, LOH, LFTs, and ESR

v) CXR

vi) Trans-rectal ultrasound morphology

vii) Bone Scan

viii) Outflow obstruction tests; bladder ultrasound, urine flow rates, Intra Venous Urogram (IVU)

Treatment

Depends on prognostic grouping, i.e.

- Favourable risk:
  the four options of treatment in this group are Curative Radiotherapy, Brachytherapy, Radical Prostatectomy, and Active Surveillance. No adjuvant Androgen deprivation.
- Intermediate risk:
  Curative Radiotherapy with neoadjuvant androgen deprivation for 3 months prior to radiotherapy. Some patients may require transurethral resection of the prostate to relieve symptoms of urinary retention
- High risk but still organ-confined:
  Radiotherapy to whole pelvis plus adjuvant androgen deprivation for a period of 2 - 3 years. Some patients may require transurethral resection of the prostate.
- Metastatic disease, options include:

i) Surgical castration (Bilateral Subcapsular Orchidectorny) and some patients may require transurethral resection of the prostate

ii) Medical castration with LHRH agonists Goseriline plus an antiandrogen is given two weeks before Goseriline is commenced.

iii) Antiandrogens: Cyproterone acetate 50 – 100mg TDS PO daily for 2 - 3 years.
iv) Chemotherapy with Docetaxel 75mg/ m2 IV repeat 21 days for 6 cycles with or without estramustine or prednisolone, in those patients who have failed after adequate androgen deprivation therapy.

Radiotherapy to treat painful bony metastasis including spinal cord compression.

8.8. TESTICULAR TUMOURS

Description
These are malignant growths that arise from the testis. It is a common malignancy in males aged between 15-34 years.

Classification
i) Seminomas
ii) Non-seminomas

Clinical Features
Testicular mass, that is either painful

Diagnosis
- History and physical examination
- Testicular ultrasound
- HCG, Fetoprotein, LOH
- FBC, U/E's, LFT's,
- CXR

Treatment
High Inguinal orchidectomy
Further treatment depends on the stage and histological type

Seminomas

Stage I disease: after surgery options include:
- Radiotherapy 2Gy to 20Gy total to paraaortic area
- Single agent, single dose Carbop latin dose in mg = 5 - 7 AUC (see formula) or 400 mg/m2 IV

- Active surveillance (only in expert hands)

Stage II: Surgery followed by 2 - 3 cycles of BEP i.e.
- Bleomycin 30 units IV D1, 8 & 15
- Etoposide 100 mg/m2 D1 -5 IV,
- Cisplatin 20mg/m2 D1 - 5 IV every 21 days.

Stage III: Surgery followed by 4 cycles BEP as above

Non-Seminomas
Stage I: Surgery followed by BEP chemotherapy 2 -4 cycles every 21 days

Stage II and III: Surgery followed by BEP chemotherapy 4 cycles every 21 days.

8.9. VULVAL CANCER

Description

These are cancers that arise from the vulva and are mostly Squamous Cell Carcinomas

Clinical Features

Pruritus, waterly discharge, bleeding, mass, pain and ulceration.

Diagnosis

- History and physical examination
- Biopsy including pap smear and colposcopy
- CXR
- FBC, U/ Es and LFTs
- HIV and CD4 count

Treatment

All patients must be seen and assessed at the combined Gynaecology and Oncology meeting to plan treatment

1. Primary treatment

a) surgery with 1cm margin of resection of the vulval lesion and inguinal lymphadenectomy

b) Definitive chemoradiation for inoperable patients, refused or medically inoperable patients. Radiotherapy 1.8Gy per fraction to 66-70Gy concurrent with chemotherapy

2. Adjuvant treatment

a) Post-operative chemoradiation is indicated for patients with the following; positive or close <8mm, 2 or more positive lymph nodes. Radiotherapy 1.8Gy per fraction to a total of 60-65Gy

b) Preoperative chemoradiation is indicated for

patients with central disease within 1cm of vital structures, fixed bulky positive or ulcerating nodes or inoperable primaries to downsize them for operability. Radiotherapy 50Gy split course with surgical assessment after 30Gy followed with 20Gy boost concurrent with chemotherapy

Regimens

1. Chemotherapy ONLY in comb ination with Radiation therapy

a) 5-Fluorouracil 400mg/m2 IV D1 - 4 and D28 -32 plus Cisplatin 25mg/m2 IV D1 - 4 and D28 - 32
b) Radiotherapy

8.10. PENILE CANCER

Description
This is cancer that arises from the penis.

Classification
Most of these are squamous cell carcinomas

Clinical Features
Penile nodule, mass, or ulcer which is non-healing.

Diagnosis
- History and physical examination
- Biopsy of ulcer or mass
- CXR
- FBC, U/Es
- HIV and CD4 count

Treatment
1. Surgery: in the form of circumcision, excision, partial or total penectomy followed by bilateral inguinal node dissection in clinically involved nodes.

2. Radiotherapy: curative radiotherapy is used in young patients who still want to preserve penile function.

3. Chemotherapy is given concurrent with radiotherapy using Cisplatin 25mg/m2 D1 - 4 IV and D28 - 32 and 5-Fluorouracil 400 mg/m2 D1 - 4 and D28 - 32 IV.

8.11. NON-MELANOMA SKIN CANCER

8.11.1. Squamous Cell Carcinoma of the skin

Description
This is a cancer of the squamous cells of the skin.

Symptoms and signs
- Plaque or nodule on the skin

- Non-healing ulcer

Diagnosis
History and physical examination
- Biopsy
- Imaging studies as indicated especially for extensive disease

Treatment
Surgery: Excision with adequate margins Radiotherapy
with or without concurrent chemotherapy.

8.11.2. Basal cell carcinoma

Description
This is cancer derived from the epidermal basal cell layer. It is more common in elderly people and Caucasians.

Symptoms and Signs
- Nodule
- Skin thickening
- Ulcer with rolled-up margins

Diagnosis
- History and physical examination
- Biopsy

Treatment
i) Early removal by curettage
ii) Cryotherapy
iii) Surgery: excision with adequate margins
iv) Radiotherapy.

For patients in whom surgery would result in poor cosmesis and function, radiotherapy is the treatment of choice.

8.11.3. Melanoma

Description
This is a neoplasm arising from melanocytes. It is the commonest of fatal skin cancer. Some melanomas arise in pre-existing moles.

Symptoms and Signs
i) Rapid enlargement of a pigmented lesion
ii) Bleeding
iii) Increasing variegated pigmentation
iv) Ulceration
v) Persistent itching
vi) Small satellite lesions around the principal lesion
vii) Local regional lymph node involvement

ABCD are suspicious symptoms of lesions that are progressing to melanomas

Asymmetry
- Irregular borders
- Colour variegation
- Diameter greater than 6mm

Diagnosis
- History and physical examination
- Excisional biopsy or full-thickness wedge/ punch biopsy
- CXR (stage 1B and above)
- FBC, U/Es, LFTs, LDH
- CT Scan depending on the site of primary disease

Treatment
Prompt excision with wide margins with local regional lymph node dissection

Metastatic disease
- Radiotherapy for palliation
- Chemotherapy with either single agent Darcabazine 200mg/m2 D1 -5 or 750 - 800mg/m2 IV D1 every 3 weeks

8.11.4. Kaposi's sarcoma

Description
This is cancer arising from capillary endothelial cells associated with HHV8.

Classification
In Zambia we commonly see
1. Endemic type
2. Epidemic type of KS. This is associated with HIV infection

Clinical features
Signs and Symptoms
- Purple (dark) papules, nodules, patches and plaques on the skin and mucosa
- Lymphadenopathy
- Woody oedema of the legs
- Visceral involvement

Diagnosis
- History and physical examination
- Biopsy of Lesion (skin, mucosal or lymph nodes)
- HIV and CD4
- FBC, U/Es, LFTs
- CXR

Treatment
Depends on the type of the KS
1. Endemic KS: Local radiotherapy
2. Epidemic KS: Start antiretroviral therapy.

Chemotherapy
Radiation therapy for localized disease

Chemotherapy regimens
ABV: Adriamycin (Doxorubicin) 20mg/m2 IV D1, Bleomycin 15 Units IV D1, Vinblastine 6mg/m2 IV D1

Repeat cycle every 14 - 21 days tapered to the best response (response is therefore individualized).

Note: Do not exceed 450mg/ m2 Doxorubicin (Adriamycin) total/absolute dose. Use BV only after 6 cycles of ABV.

Liposomal Doxorubicin 20mg/m2 IV every 14 days or Danaurubicin 40mg/m2 IV every 14 days to the best response.

Paclitaxel 100mg/m2 every 14 days OR 135mg/m2 every 21 days to the best response.

8.12. OESOPHAGEAL CARCINOMA

Description
This is a malignancy that arises from the oesophagus.

Classification
The majority are Squamous cell carcinomas. Adenocarcinomas arise commonly from the lower third
(gastro-oesophageal junction).

Symptoms and Signs
- Progressive dysphagia
- Pain
- Odynophagia (painful swallowing)
- Weight loss
- Regurgitation
- Vomiting

Diagnosis
- History and physical examination
- Barium swallow
- Oesophagoscopy and biopsy
- CXR
- FBC, U/Es, LFTs
- For lesions less than 5cm, do CT scan, chest and Abdominal ultrasound
- Endoscopic ultrasound

Treatment
For lesions less than 5cm

- Surgery – Oesophagectomy for primarily operable tumours
- Preoperative chemo-radiation followed by surgery for those requiring downsizing

For lesions 6 – 7cm

- Curative chemo-radiation

Chemotherapy

- Cisplatin 40mg/m^2 IV weekly concurrent with radiotherapy at 1.8Gy per fraction to 50.4Gy

OR

5-Fluorouracil 400mg/m2 IV D1-4 with Cisplatin 75mg/ m2 IV D1 repeated every 21 days concurrent with radiation therapy
Lesions more than 7cm and all patients who have lost more than 10% of their body weight will require

Palliative treatments

- Surgery i.e. dilatation, stenting, bypass
- Radiation therapy with external beam alone, brachytherapy alone or a combination of these

8.13. COLORECTAL CARCINOMA

Description
Cancer of the large bowel.

Symptoms and Signs

- Rectal bleeding
- Mucoid rectal discharge
- Alternating constipation with diarrhoea Intestinal obstruction
- Anaemia Weight loss

Diagnosis

- History and physical examination including a digital rectal examination

- Double-contrast barium enema
- Proctosigmoidoscopy and colonoscopy with BIOPSY
- FBC, u/Es, LFTs, CEA
- CXR
- Ultrasound of abdomen and pelvis Transrectal ultrasound
- CT Scan abdomen and pelvis

Treatment
The mainstay of treatment is surgery.

Adjuvant treatment for colon cancer

- Stage I and II no further treatment after surgery but require follow up with a yearly colonoscopy
- Stage III and IV will require adjuvant chemotherapy

Adjuvant treatment for rectal carcinoma

- Preoperative short-course radiotherapy: 5Gy daily for 5 days followed by surgery one week later.
- Preoperative long course chemo-radiation
- Post-operative chemo-radiation

Chemotherapy regimen:
FL: 5-Fluorouracil 425mg/m2 D1 – 5 IV; Leucovorin 20mg/m2 D1 – 5 IV 30 minutes before 5-FU
Repeat every 28 days for 6 cycles

OR
FOLFOX

- 5-Fluorouracil as above
- Leucovorin as above
- Oxaliplatin 85mg/m2 D1 only IV

8.14. GASTRIC CANCER

Description
This is a cancer of the stomach.

Classification
Most are adenocarcinomas.

Symptoms and Signs
Initially, symptoms are vague and non-specific.
- Dysphagia
- Post-prandial fullness
- Heartburn
- Indigestion
- Loss of appetite
- Weight loss
- Abdominal discomfort and fullness
- Haematemesis and melaena
- Anaemia

Diagnosis
- History and physical examination
- Endoscopy with biopsy
- FBC, U&Es, LFTs, CEA
- Barium meal
- CXR
- Abdominal ultrasound CT scan of the abdomen
- Endoscopic ultrasound

Treatment
- Surgery - Is the primary treatment. Subtotal or total gastrectomy with adequate lymphadenectomy and negative margins.
- Radiotherapy
- Adjuvant Chemoradiation for stage 1B and above
- Definitive chemoradiotherapy for medically unfit or unresectable patients
- Palliative radiotherapy
- Chemotherapy
- Leucovorin 20 mg/m2 IV bolus, 5-Flourouracil 425mg/m2 IV bolus D7 - D5 (cycle 7, 4,5)
- Leucovorin 20mg/m2 IV bolus, 5-Flourouracil 400mg/m2 IV bolus first 4 and last 3 days of radiotherapy (cycle 2 & 3)

- Metastatic cancer: - Leucovorin 20mg/m2 IV bolus, 5-Flourouracil 425mg/m2 IV bolus D1-D5 28-daycycle, 6 cycles.

8.15. PANCREATIC CANCER

Description
This is a cancer of the pancreas.

Classification
Adenocarcinomas

Symptoms and Signs
- Upper abdominal pain
- Vomiting
- Obstructive jaundice
- Pruritis
- Weight loss
- Symptoms of diabetes mellitus
- Migratory thrombophlebitis
- Upper abdominal mass
- Palpable gall bladder

Diagnosis
- History and physical examination
- Endoscopic ultrasound and/ERCP/ biopsy
- FBC, LFTs, U & Es, CEA, blood glucose
- CXR
- CT scan

Treatment
1. Surgery: Definitive - Mainstay of treatment (Whipple's procedure)
2. Palliative surgery for advanced cases - Endoscopic or Percutaneous biliary stent, Open biliary enteric bypass.
3. Radiotherapy

Post-operative 5-FU-based chemoradiation (45-54Gy at 7.8-2Gy/day) followed by systemic Gemcitabine

Localised unresectable disease and good performance status - Concurrent 5-FU based chemoradiation (50-60Gy at 7 .8-2Gy /day)

Palliation of pain and metastases.

Chemotherapy
- With Chemoradiation FU-500mg/m2 IV bolus on first and last 3 days of radiotherapy
- Gemcitabine 1000mg/m2 over 30minutes IV D1,
8 & 7 every 28 days for 6 cycles as adjuvant therapy and locally unresectable or metastatic disease.

8.16. ANAL CANCER

Description
This is a cancer of the anal canal.

Classification
- Squamous
- Cloacogenic (transitional)
- Adenocarcinoma
- Others – Paget's disease, basal cell, melanoma, lymphoma

Symptoms and signs
- Bleeding
- Anal pain
- Pruritis
- Palpable mass
- Change in bowel habit
- Chronic anal condition
- Haemorrhoids, fistula, fissure

Diagnosis
- History and physical examination including DRE, gynaecologic exam in women
- EUA, Proctoscopy, Biopsy of the primary tumour
- FNA/biopsy of clinically suspicious inguinal nodes
- CXR
- Abdominal pelvic CT scan
- Ultrasound abdomen and pelvis if unable to do a CT scan
- FBC, U&Es, LFTs, HIV, CD4

Treatment

Surgery

- Wide local excision – Only in tumours <2cm which is well-differentiated, and preservation of anal function assured
- Abdominal perineal resection – is reserved only for salvage of patients who have failed chemoradiotherapy

Combined modality therapy

- Chemoradiation is the standard primary treatment option with doses of 45-60Gy
- 5-Fluorouracil 400mg/m2 Day1-4 and Day 22-25 of radiotherapy
- Mitomycin-C 10mg/m2 Day 1 only.

Mitomycin may be substituted by Cisplatin especially in HIV positive patients.

8.17. ASTROCYTOMAS

Description

These are glial tumours (astrocytomas and oligodendrogliomas) that arise from supportive tissues in the CNS and represent over 400 out of all CNS tumours in adults. In childhood, astrocytomas predominate.

Classification

- Low-grade astrocytomas include WHO grade I (fibrillary, pilocytic) and II (astrocytoma)
- High-grade astrocytomas include WHO Grade III (anaplastic) and IV (glioblastoma multiforme)

Symptoms and signs

- Headache (usually persistent)
- Nausea, vomiting
- Poor balance and coordination
- Seizures
- Hemi- or para-paresis
- Visual disturbances

Diagnosis

- History and physical + neurological examination

- Skull X-ray
- Brain CT or MRI scan
- Radionuclide brain scan

Treatment
The mainstay of treatment is complete surgical resection where possible for both low or high grade

- Low-grade astrocytomas
  - Complete resection followed by observation
  - In incomplete resection observation or adjuvant chemotherapy and/or radiation therapy is considered
- High-grade astrocytomas (anaplastic or glioblastoma multiforme)
  - Complete surgical resection followed by radiotherapy alone or concurrent with Temozolomide

Chemotherapy:

- Single-agent regimens
- Carmustine (BCNU) 80 mg/m2 IV D1-3 every 6-8 weeks
- Lomustine (CCNU) 130 mg/m2 PO D1 every 6-8 weeks
- Combination chemotherapeutic regimens

1.PCV
Procarbazine 60mg/m2 PO D8-21
Lomustine 110 mg/m2 PO D1
Vincristine 1.4 mg/m2 IV D8 & D29
Repeat every 6-8 weeks (max 10 courses)
2.P E
Cisplatin 30 mg/m2 IV D 1-3
Etoposide 150 mg/m2 IV D 1-3
Repeat every 3 weeks 6-8 courses

- Radiotherapy using 3D conformal radiation therapy technique

Low-grade gliomas 1.8Gy per fraction to 50.4Gy
High-grade gliomas 1.8Gy per fraction to a total of 54 – 59.9Gy.

8.18. LUNG CANCER

Description
This is a malignancy that arises from lung parenchyma.

Classification

Small Cell Lung Cancer (SCLC)
Non-Small Cell Lung Cancer (NSCLC) this includes squamous cell, adenocarcinoma and large cell carcinoma.

Symptoms and signs

- Cough
- Bloodstained sputum
- Breathlessness
- Chest pain Difficulty breathing
- Weight loss
- Horse voice
- Unresolving pneumonia
- Paraneoplastic syndromes
    1. SIADH secretion
    2. Hypercalcaemia
    3. Myopathy
    4. Cerebellar degeneration
    5. Myasthenic syndrome

Diagnosis

- History and physical examination
- CXR
- Histology

1.Sputum
2.Lung Biopsy FNAB or open lung biopsy
3.Pleural cytology or pleural biopsy
4.Lymph node biopsy via a Mediastinoscopy or mediastinotomy

- FBC, U/Es LFT s LOH, CMP
- CT chest and upper abdomen
- PET scan

Treatment

- SCLC

1. Limited Stage disease: - concurrent chemoradiation with Cisplatinum and Etoposide and Radiation therapy at 1.SGy BO to 45Gy. This is followed by prophylactic cranial irradiation for complete responders

2. Extensive Stage disease: chemotherapy with Cisplatinum and Etoposide followed with consolidation radiotherapy for patients with a near-total or partial response.

- NSCLC

The treatment depends on the stage

1. Stage I, II and IIIA:- Surgery is mandatory followed with 4 cycles of adjuvant chemotherapy with

Cisplatin + Etoposide or Carboplatin + Vinorelbine, or Cisplatin + Gemcitabine. In completely resected NSCLC radiation therapy to 60Gy is reserved for those with positive lymph nodes or resection margins.

2. Locally advanced is treated with chemoradiation to 66Gy concurrent with Cisplatinum based chemotherapy

3. Metastatic disease is treated with chemotherapy and radiotherapy is used in this situation for palliation.

8.19. NASOPHARYNGEAL CARCINOMA

Description

This is a carcinoma that arises from the nasopharynx commonly the Iossa of resenmuller.

Classification

- Keratinising squamous cell carcinoma WHO type I
- Non-keratinizing squamous cell carcinoma WHO type II.
- Undifferentiated squamous carcinoma or lymphoepithelial carcinoma WHO type III.

Symptoms and signs

- Nasal voice
- Nasal congestion and obstruction
- Nasal bleeding
- Neck swellings/lymphadenopathy
- Cranial nerve palsies
- Other CNS signs
- Bone pain and/or tenderness

Diagnosis

- History and physical examination
- CXR
- FBC, U/Es, LFTs
- CT Scan whole brain and base of the skull to the clavicle
- Biopsy of nasopharynx

Treatment
The mainstay of treatment of NPC is radiotherapy.
Stage I & II:
Curative radiation therapy to 70Gy at 1.8 – 2GY per fraction
Stage III:
Chemoradiation to 70Gy with Cisplatinum 75–100mg/kg IV 3 weekly starting with day 1 of radiation treatment and currently this is followed with 4 cycles of Cisplatinum and 5-Fluorouracil

8.20. OTHER HEAD AND NECK CANCER

Sites
- Larynx
- Oral cavity
- Oropharynx
- Nasal cavity and paranasal sinuses
- Salivary gland tumours

All these sites have unique symptoms and signs

Treatment
Depends on the stage
Stage I & II:
Surgery or curative radiation therapy produce equivalent results but differ in the side effect profile.

Stage III:
has three options of treatment

4. Surgery followed with postoperative radiation therapy plus or minus chemotherapy
5. Curative chemoradiation for organ sparing
6. Radical radiotherapy for medically challenged patients who cannot stand chemotherapy

8.21. THYROID CANCER

Description
These are malignancies that arise from the thyroid gland

Classification
There are four categories based on the WHO classification.
Two differentiated Thyroid Cancer
Papillary Adenocarcinoma
follicular Adenocarcinoma
- Medullary thyroid carcinoma
- Anaplastic thyroid carcinoma
- Malignant lymphomas of the thyroid are not uncommon

Symptoms and signs
- Thyroid nodule – found incidentally or during routine physical examination
- Lump in the neck
- hoarseness of voice if recurrent laryngeal nerve involved or extension to the larynx,
- Dysphagia if an oesophageal extension is present.
- Neck nodes
- Haemoptysis
- Cough
- Chest pain
- Bone pain
- Diarrhoea due to calcitonin, serotonin or prostaglandin production in those with MTC.

Diagnosis
- History and examination
- ENT exam
- Ultrasound of the neck FNAB is recommended at this stage
- CXR
- FBC, CMP, U/E's and LFT's
- Preoperatively
  - Routine use of CT scan, MRI and PET scan is not recommended
  - Thyroglobulin level not recommended
- Postoperatively

- All patients with papillary and follicular cell carcinoma must have an initial 131-Iodine diagnostic scan within 6 weeks post-surgery
- Ultrasound of the neck with Tg levels
- CT scan with contrast is contraindicated
- Non-contrast CT chest can detect pulmonary metastasis
- PET scan is useful in patients with:
- increased Tg levels and a negative 131-Iodine uptake scan
- MRI - useful post-op in all forms of thyroid cancer to detect local recurrence

Treatment
Surgery is the definitive treatment for all the histological types mentioned previously. This must be a near or total resection with a central neck dissection done plus posterior lateral neck dissection if these nodes are involved. For OTC surgery is followed by radioactive iodine therapy in selected cases. ATC require adjuvant radiotherapy and/or chemotherapy after surgery. MTC a thyroidectomy is followed by genetic testing of the individual and family members.

Radio-active Iodine 131 Therapy:
this is indicated in all OTC patients with a positive RAI uptake scan at 6 weeks post-operatively, in which case 100 - 150mCi is given orally. This achieves 85 - 95% complete ablation of residual thyroid tissue. A repeat whole-body scan is done at 5 - 10 days post-131-Iodine therapy. Start thyroid replacement and at 3 months do TSH and Thyroglobulin and at 6 months repeat 131-Iodine uptake scan. This is repeated every 6 months until all thyroid tissue is ablated including metastatic areas.

Radiation therapy:
is used for inoperable tumours, and in palliation of symptomatic metastatic areas.

Chemotherapy:
the preferred agent is Doxorubicin and is indicated in ATC only postoperatively.

8.22. PAEDIATRIC CANCER

8.22.1. Medulloblastoma

Description

Medulloblastoma is a primitive cerebellar tumour of neuroectodermal origin that is the most common posterior fossa malignant tumour in children. It accounts for 20% of paediatric brain tumours.

Symptoms and Signs

- Headache
- Vomiting
- Convulsions
- Ataxia
- Cranial nerve palsies
- Coma and unconsciousness
- BP and pulse

Diagnosis

- History and physical examination
- CSF cytology
- MRI or CT scan of the brain and whole spine
- FBC, U/Es
- Audiometry
- Histological confirmation is done after craniotomy and complete resection of the tumour

Treatment

Depends on the risk category

- Average Risk: children older than 3 years, no metastasis, near to total resection, with less than 1.5cm^2 residual disease on early postoperative imaging (24-48hrs)
- High Risk: overt metastatic disease based on CSF cytology or imaging > 1.5cm^2 residual disease, and all children < 3 years of age.

1. Surgery:

Maximal judicial surgical resection is the most important step. However, the aggressiveness of surgery is sometimes associated with the posterior Iossa syndrome in up to 150/o of children post-op. (difficulty swallowing, truncal ataxia, mutism and less often respiratory failure)

2. Radiation Therapy

- Average Risk Medulloblastoma:

The standard of care for average-risk medulloblastoma is either Cranial Spinal Irradiation (CSI) to 23.4Gy with platinum-based chemotherapy, OR CSI to 35 Gy without chemotherapy with a boost in both situations of the posterior Iossa to a total dose of 54 - SSG y in both situations

- High-Risk Medulloblastoma:

Post-operative irradiation is given first followed by chemotherapy as a preferred sequence.
However pre-irradiation chemotherapy is sometimes utilised in some centres with a risk of disease progression.

Chemotherapy regimens

- Vincristine 1.5mg/m2 D1 weekly for 3 consecutive weeks
- Lomustine (CCNU) 75mg/m2 orally D1, Cisplatin 75mg/m2 IV D1
- Repeat every 6 weeks for 8 cycles.

8.22.2. Retinoblastoma

Description
A malignant tumour of the embryonic neural retina that may arise from single or multiple foci in one or both eyes

Clinical features
Symptoms

i) White pupillary reflex
ii) Leucokoria
iii) Red painful eye
iv) Strabismus
v) Eye tumour

Signs

i) Creamy-pink mass projecting into vitreous
ii) A white avascular tumour
iii) Retinal detachment
iv) Vitreous haemorrhage

v) Clouding of the anterior chamber

Complications

- Loss of vision
- Local Pain
- CNS disease
- Anaemia

Diagnosis

- History and Clinical Examination findings
- Investigations for Staging of Retinoblastoma
  - I. The intraocular extent of disease
    - Indirect ophthalmoscopy
    - Ultrasonography of globe
  - II. The orbital extent of disease
    - A. Plain X-ray of the optic foramen, orbit, and skull
    - B. CT scan of the orbit
  - III. Metastatic evaluation
    - A. LP: CSF for cytology
    - B. FBC
    - C. LFTs include ferritin and NSE
    - D. BM aspiration for histology and cytogenetics; BM biopsy
    - E. Abdominal US (Liver/Spleen)
    - F. CT of brain, head and Abdomen
    - G. Bone Scan
    - H. Biopsy of extraocular masses
    - I. Globe and optic nerve stump histopathology (if enucleation is done)

Added investigations to include ECG and as patient's condition dictates.

Reese-Ellsworth Intraocular staging:

Group I. *Very favourable*

A. Solitary tumour, less than 4 disc diameters in size at or behind the equator

B. Multiple tumours, none over 4 disc diameters in size at or behind the equator

Group II. *Favourable*

A. Solitary tumour, 4-10 disc diameters in size at or behind the equator

B. Multiple tumours, 4-10 disc diameters in size behind the equator

Group III. *Doubtful*
A. Any lesion anterior to the equator
B. Solitary tumours larger than 10 disc diameters in size behind the equator

Group IV. *Unfavourable*
A. Multiple tumours larger than 10 disc diameters
B. Any lesion extending anterior to the oraserrata

Group V. *Very unfavourable*
A. Massive tumours involving more than one-half the retina
B. Vitreous seeding
*Staging for the probability of retaining useful vision rather than survival.

Grabowski-Abramson Clinicopathologic Staging of Retinoblastoma

Stage Description
I. Intraocular disease
   a. Retinal tumour, single or multiple
   b. Extension to lamina cribrosa
   c. Uveal extension
II. Orbital disease
   a. Orbital tumour
      1. Scattered episcleral cells
      2. Tumour mass
   b. Optic nerve
      1. Distal nerve; the line of resection and meninges clear

      2. Tumour at the line of resection or in meninges

III. Intracranial metastasis
   a. Positive CSF alone
   b. A mass lesion in CNS
IV. Haematogenous metastasis
   a. Positive BM alone
   b. Focal bone lesions with or without positive marrow
   c. Other organ involvement

Treatment
Stage/extent of disease determines the choice of treatment modality.

Treatment modalities for the intraocular disease include:
1. External beam radiotherapy
2. Episcleral plaque therapy
3. Photocoagulation
4. Cryotherapy
5. Enucleation.
6. A combination of the above modalities

Treatment modalities of extraocular disease: Adjuvant chemotherapy improves survival in patients with extraocular disease following enucleation. Patients with overt CNS disease or with a high probability of meningeal spread should receive intrathecal methotrexate and cytosine arabinoside, and if possible cranial irradiation. Stage II, III and IV all require multimodality therapy of Enucleation, Radiation and Chemotherapy (plus intrathecal chemotherapy).

Medicine Stage II and III

Phase	Week	Medicine	Dose
	0	Cyclophosphamide Doxorubicin Vincristine	40 mg/kg IV, Day 1 0.67 mg/kg IV, Days 1, 2, 3 0.05 mg/kg IV, Day 1
	3-21 (Repeat every 3rd week)	Cyclophosphamide Doxorubicin Vincristine	20 mg/kg IV, Day 1 0.67 mg/kg IV, Days 1, 2, 3 0.05 mg/kg IV, Day 1
	24-57 (Repeat every 3rd week) 0, 1, 2, 3, 4, 5	Cyclophosphamide Vincristine Methotrexate Cytarabine	30 mg/kg IV, Day 1 0.05 mg/kg IV, Day 1 IT IT

Medicines Stage IV

Phase	Week	Medicine	Dose
	0	Cyclophosphamide Doxorubicin Vincristine	40 mg/kg IV, Day 1 0.67 mg/kg IV, Days 1, 2, 3 0.05 mg/kg IV, Day 1
	3, 9, 15, 21	Cisplatin Etoposide	3 mg/kg IV, Day 1 3.3 mg/kg IV, Days 1, 2, 3
	6, 12, 18, 24, 27, 30, 33	Cyclophosphamide Doxorubicin Vincristine	30 mg/kg IV, Day 1 0.67 mg/kg IV, Days 1, 2, 3 0.05 mg/kg IV, Day 1

Phase	Week	Drug	Dose
	36 – 105 (Repeat every 3rd week)	Cyclophosphamide Vincristine	30 mg/kg IV, Day 1 0.05 mg/kg IV, Day 1
	0, 1, 2, 4, 5, 6	Methotrexate Cytarabine	IT IT

8.22.3. Nephroblastoma (Wilms' Tumour)

Description

A primary malignant renal tumour of childhood that is derived from primitive and may arise in one or both kidneys occurring with equal frequency in both girls and boys and may be associated with congenital anomalies.

Clinical features

Signs and Symptoms

Commonly presents as a palpable mass in the abdomen. Other symptoms and signs include any of the following:

- Hypertension
- Hematuria
- Obstipation
- Weight loss
- Dysuria Diarrhoea

Others: nausea, vomiting, abdominal pain, cardiac insufficiency, pleural effusion, polycythemia, hydrocephalus

Wilms tumour may occur in association with congenital anomalies in some patients.

The most frequent congenital anomalies are:

Congenital aniridia

Hemi-hypertrophy

Beck with-Wiedemann syndrome

Hyperplastic fetal visceromegaly involving the kidney, adrenal cortex, pancreas, gonads and liver

Macroglossia, omphalocele, hemihypertrophy, microcephaly, mental retardation, hypoglycemia and postnatal somatic gigantism

Associated with an increased incidence of WT, adrenal carcinoma, hepatoblastoma, and gonadoblastoma

- Genitourinary tract anomalies

Diagnosis
History and physical examination

Investigations
- FBC, U/E, LFT, Coagulation profile

- ECG and echocardiogram
- Abdominal Ultrasound
- IVU
- CXR
- Abdominal and Chest CT scan

Staging
International Society for Paediatric Oncology (SIOP)
Nephroblastoma staging

Stage	Description
I	Tumour limited to the kidney, complete excision
	tumour extending outside the kidney, complete excision
I	a) invasion beyond the capsule, perirenal/perihilar
	b) invasion of the regional lymph nodes (hilar nodes and/or
I	periaortic nodes at the origin of the renal artery
	c) invasion of the extrarenal vessels
	d) invasion of ureter
	Invasion beyond the capsule, incomplete excision
	a) preoperative or perioperative biopsy
	b) preoperative/perioperative rapture
	c) peritoneal metastasis
	d) invasion of paraaortic lymph nodes
III	
	e) incomplete excision Distant metastasis
IV	*Bilateral renal tumours*
V	

Treatment

Multiple modality approach that is dependant on stage and risk combining surgery, chemotherapy andradiation

Pre-nephrectomy Therapy

Phase	Week	Drug	Dose
Pre OP	1, 2, 3, 4	Vincristine	1.5 mg/m2 IV, Day 1
	1, 3	Actinomycin D	0.015mg/m2IV, **Day 1, 2, 3**

Post-operative Therapy

Stage I, Favourable histology: No therapy Stage I, Standard histology and anaplastic WT Drugs
Actinomycin D Vincristine

Phase	**Week**	**Drug**	***Dose***
Post OP	1, 2, 3, 4,	Vincristine	*1.5 mg/m2 IV,*
	10, 11, 17,		*Day 1*
	18		
	1, 10	Actinomycin D	*0.015mg/m2IV,* ***Day 1, 2, 3, 4, 5***

Stage II Standard histology

Drugs
Actinomycin-D (Dactinomycin)
Vincristine
Doxorubicin

Radiation

Phase	**Week**	**Drug**	*Dose*
Post OP	1, 2, 3,	Vincristine	*1.5 mg/m^2 IV,*
	4, 5, 6,		*Day 1*
	7, 8		
	11, 12, &		
	14, 15		
	17, 18, &		
	20, 21		
	23, 24, &		
	26, 27		
	1, 11	Actinomycin-D	*0.015 mg/m^2 IV,*
			Day 1, 2, 3, 4, 5
	4, 8, 14	Doxorubicin	*50 mg/m^2 IV,*
			Day 1
	2 – 3	**Radiation**	

Stage II and III anaplastic WT, I to III clear cell sarcoma

Drugs
Actinomycin-D
Vincristine
Doxorubicin

Radiation

Phase	**Week**	**Drug**	***Dose***
Post OP	1, 2, 3, 5, 7 10, 11, 12, and 14, 15 17, 18, 19, and 21, 22 24, 25, 26, and 28, 29 31, 32, 33, and 35, 36 5, 14, 21,	Vincristine	*1.5 mg/m^2 IV, Day 1*
	28, 35	Actinomycin D	*0.030 mg/m^2 IV, Day 1*
	1, 10	Doxorubicin	*50 mg/m^2 IV, Day 1*
	3, 12	Ifosfamide	*3000 mg/m^2 IV, Day 1*
	5 - 8	**Radiation**	

8.22.4 Rhabdomyosarcoma

Description
A malignant tumour of striated muscle that may occur in any anatomical location of the body, but commonly occur in the head and neck region, genital urinary tract and extremities.

Clinical features
Symptoms and Signs
Commonly presents as a mass with specific clinical manifestations varying with the site of origin

Head and Neck
Neck
- xxxxxSoft tissue mass
- Hoarseness
- Difficulties swallowing

Orbit
- Conjunctival mass
- Proptosis
- Ocular palsies

Nasopharynx & Paranasal sinus
- Swelling
- Local pain
- Epistaxis
- Difficulties swallowing
- Sinusitis
- Unilateral nasal discharge

Genitourinary
- Vaginal bleeding
- Vaginal mass
- Dysuria
- Haematuria
- Urinary obstruction
- Painless paratesticular mass

Diagnosis

History and Clinical Examination findings

Investigations for Staging of Retinoblastoma

- Urinalysis
- FBC
- U/E
- LFTs
- Skeletal X-rays
- CT Scan
- Bone Scan
- BM aspiration and Biopsy
- Biopsy of the tumour

Other special examinations and investigations

- Head and Neck tumour
- Ear, nose throat examination under anaesthesia
- Ophthalmologic examination
- LP and CSF cytology
- Abdominal Pelvic tumour
- Abdominal US
- Cystoscopy

Grouping

Group I. Definition

A. Localized, completely resected, confined to the site of origin.

B. Localized, completely resected, infiltrated beyond the site of origin.

Group II. A. Solitary tumour, 4-10 disc diameters in size at or behind the equator.

B. Regional disease, involved lymph nodes, completely resected.

C. Regional disease, involved lymph nodes, completely resected with microscopic residual.

Group III.A local or regional grossly visible disease after biopsy only.

B. Grossly visible disease after >50% resection of the primary tumour.

Group IV. Distant metastasis present at diagnosis

Staging

TNM staging system

Stages 1 to IV Treatment
Multiple modality approach that is dependent on stage combining surgery, chemotherapy and radiation

9. EYE DISEASES

9.1. THE RED EYE

This is characterised with the reddening of the eye caused by:

With Pain Without Pain

Iritis Conjunctivitis
Corneal Foreign Body – Allergic
Acute Glaucoma – Viral epidemic Haemorrhagic
Chemical Conjunctivitis – Bacterial Conj. (Ophthalmia neonatorum)

Corneal Ulcers

Penetrating and Perforating Eye Injuries

9.1.1. With Pain

9.1.1.1. Iritis

Description
It is the inflammation of the Iris.

Clinical Features
Symptoms
- Deep-seated eye pain
- Decreased vision
- Redness of the eye
- Light intolerance
- Watery eye

Signs
- Pink ring of blood vessels around the cornea – ciliary flush
- Small white spots on the back of the cornea – keratic precipitates
- Iris may be stuck to the lens – posterior synechiae

Treatment
- Atropine 1% Eye ointment twice daily
- Betamethasone 1% eye drops, or

- Hydrocortisone 1% eye drops, or
- Dexamethasone 0.1% eye drops, or Prednisolone 1% eye drops 1-2 times a day

9.1.1.2. Corneal Foreign Body

Description
This is the presence of a foreign body on the cornea.

Clinical Features
Symptoms
- Red eye
- Watering eye discharge
- Difficulty to keep the eye open
- Pain
- Distorted vision

Sign
Foreign object may be seen on the cornea

Treatment
- Apply a drop of 2% Lignocaine onto the affected eye
- Wipe away the foreign body with a wisp of sterile cotton wool on an orange stick
- If the foreign body does not come out easily refer to the nearest eye clinic where it may need surgical removal
  (with a hypodermic needle)
- Chloramphenicol 0.5% eye drops 1 drop every 2 hours, then reduce the frequency as the infection is controlled.

- Pad the eye for 24 hours

9.1.1.3. Acute Angle Closure Glaucoma

Description
This is an acute increase in the intraocular pressure brought about solely by the closure of the anterior chamber angle by the peripheral iris.

Predisposing Factor
- Small long-sighted eye
- Anatomical shallow anterior chamber

Clinical features

Symptoms

- Impaired vision
- Red eye
- Severe Periocular pain
- Nausea
- Vomiting
- Severe headache

Signs

- Ciliary flush
- Very, very high Intraocular pressure (50 – 100mmHg)
- Hazy Cornea Bathroom window glass type of cornea (mid dilated pupil)
- Bombe iris
- Flare
- Dilated Iris vessels
- Painful hard eye

Investigation

Tonometry with a Schiotz or Perkins tonometer will show very high intraocular pressure

Treatment

The definitive treatment is surgical

Medicines

- Acetazolamide 500mg intravenously start, then

250mg 6 hourly

- Pilocarpine 4% 6 hourly
- Paracetamol 500 – 1gm orally 6 hourly

This is the initial treatment to relieve the angle closure

Definitive Treatment

Permanently keep the angle open surgically by:

(i)Peripheral laser iridotomy

(ii)Peripheral Iridectomy

(iii)The surgery must be done to both eyes as the predisposing condition affects both eyes

Other Hyperosmotic agents

Because of their speed of action and effectiveness, hyperosmolar agents are of great value during the acute crisis of acute glaucoma to reduce the intraocular pressure.

- Mannitol (1-2g/kg body wt of 20% solution in water, given over 30 – 40 minutes, (60 drops per minute as a slow intravenous infusion) until intra-ocular pressure has been satisfactorily reduced
- Urea 1-2kg body wt of a 30% solution in 10% invert sugar

9.1.1.4. Chemical Conjunctivitis

Description
It is an inflammation of the eye caused by a chemical substance.

Common Chemicals
- Car battery acid
- Snake venom
- Fluid from plants
- Household cleaning chemicals
- Alkali chemicals are more damaging to the eye than acids

Clinical Features
Symptoms
- Pain
- Redness
- Watering
- Pus discharge if secondarily infected.

Emergency management
– Apply local anaesthetic – lignocaine 2% eye drops
– Wash the eye copiously with normal saline or tap water for about 30 minutes

Investigation
Fluorescein staining will reveal the area of conjunctival corneal chemical erosion

Treatment
- Hydrocortisone 1% Eye Ointment. Apply 3-4 times daily
- Atropine eye drops 1% 2 times a day

- Tetracycline 1% eye ointment three times daily if infected

Note that the first-line drug of choice is Hydrocortisone.

Use Tetracycline as the second line, only if a steroid is not available.

Other Medicines Used in Chemical Burns
- Vitamin C (Sodium ascorbate) 10% drops and a daily oral dose of ascorbic acid 1gm (assist in laying down of the corneal collagen)
- Collagenase inhibitors: L-cysteine and or Cenicillamine applied topically helpful in preventing corneal perforation
- Artificial tears: Prevents the effects of corneal drought. SNO tears, or Hypromelrose 0.3%
- Bandage soft contact lenses prevent the formation of adhesions between eyelid and eyeball
- Sodium EDTA - Chelates calcium, a cofactor for the collagenase enzyme, thereby rendering the enzyme unavailable for corneal melting.

Late Treatment
Division of adhesions between conjunctiva of the eye and eyelid. Place an eye shell between the divided bands during ball synechiealisis
Conjunctiva grafting
Eyelid surgery to correct the deformity
Corneal grating after 6 - 12 months to allow for maximum resolution.

9.1.1.5. Corneal Ulcers

Description
This is ulceration of the cornea.

Common causes
- Injuries
- Infections: Bacteria, Fungal, Viral
- Other causes

Clinical Features
Symptoms

- Red eye
- Severe pain
- Difficult to open eye in light (photophobia)
- Discharge, water or pus

- Disturbed vision

Signs

- Poor vision on Snellen testing a white spot of the eye may be seen
- On retinoscopy – irregular light refraction Investigation
- Fluorescein staining of the cornea, the wound stains green
- Corneal swab for microscopy, culture and sensitivity

Treatment

Depends on the cause

For all types of ulcers, prevent ocular pain with atropine 1% once daily in the affected eye

Infections

- Bacteria corneal ulcers: use Tetracycline 1% eye ointment, or Chloramphenicol 1% eye ointment 3-4 times a day
- If not resolving within 2 weeks, then refer

9.1.1.6. Fungal Ulcers

Typically see main ulcer, with riders, and satellite ulcers around the main one. (This is seen occasionally. It may not be seen at all)

Treatment

- Povidone Iodine, 2%, four times daily in the affected eye
- Natamycin, 5% eye suspension given hourly for 7 days
- Econazole, 1% suspension for topical use
- Miconazole, 10mg/ml given subconjunctival or intravitreal given as 10microgram per ml
- Amphotericin B 0.05-0.2% can be made from IV injection and instil every 5 minutes during the first hour and 30 - 60minutes until clinical picture changes. (protect from light- use umber coloured bottle)

9.1.1.7. Viral ulcers, Herpes simplex

Typical characteristic - on Fluorescein 1% or 2% staining a dendritic corneal ulcer (branching)

Treatment

- Acyclovir eye ointment (suspension) five times daily in the affected eye for about 21 days.

Note: If this has a very high association with HIV/AIDS steroids are contraindicated

9.1.1.8. Ophthalmia neonatorum

Presents 2 – 4 days postpartum

Clinical reactive
Hyperacute conjunctivitis with pus, with or without a membrane,
Severe swelling of both eyes

Treatment
- Penicillin G 50,0000 IU in 2 divided closes for 7 days – systemic
- Penicillin eye drops 1 hourly both eyes – Topical.

9.1.1.9 Penetrating and Perforating Eye Injuries

Description
Penetrating wounds are injuries of the eyeball that result from a sharp object. They typically have a wound of entry and a wound of exit. There may or may not have a retained foreign body.

Perforating wounds are injuries of the eyeball that have only one wound of entry, there also may have a retained foreign body.

Clinical Features
Symptoms
- History injury present
- Red eye
- Painful eye
- Soft eye

Signs
- The eye may be shrunken due to loss of volume
- There may be subconjunctival haemorrhage.
- Pigment discolouration of the conjunctiva in the area of the wound

- Foreign Body may be seen.

Investigation
- X-ray orbit – to rule out intraocular foreign body.
- Ocular ultrasound
- Cranial CT scan

Treatment
- Tetanus toxoid
- I.V antibiotic preferably Cefotaxime 1g stat Or
- Gentamycin 80m IV start

Refer to the nearest eye unit promptly.

9.1.2. Without Pain

The main cause of red-eye without pain is conjunctivitis of different types:
a) Infective
- Bacterial
- Viral

b) Allergic
c) Chemical

9.1.2.1. Bacterial Conjunctivitis

Description
This is a bacterial infection of the conjunctiva.

Clinical Features
Symptoms
- Ocular discomfort – gritty sensation in the eye
- Eye discharge (pus)
- Diffuse conjunctival redness

Signs
- Red conjunctiva with discharge
- Normal vision (clear cornea)

Investigation
Fluorescein staining is negative

Treatment
Tetracycline 1% eye ointment 3 – 6 times daily

Supportive
Good personal hygiene to prevent re-infection
Facial washing.

9.1.2.2. Viral Epidemic haemorrhagic conjunctivitis

Description
This is a viral infection of the conjunctiva and is associated with bleeding. The condition is very infectious and difficult to treat. It is often seen in families and epidemics.

Clinical Features
Symptoms
- Pain
- Watery discharge
- Ocular discomfort
- Photophobia

Signs
- Sub conjunctiva haemorrhage (severe redness).
- Tender cervical lymph nodes, preauricular, submental groups
- Swollen conjunctiva
- Water discharge
- Normal vision

Complication
- Secondary bacterial infection

Treatment
- Tetracycline 1% eye ointment 3 times daily for 7 days

Supportive
Patient hygiene – do not share face cloth Wash face and eyes

9.1.2.3 Allergic conjunctivitis

Description

Allergic inflammation of the conjunctiva. This condition is common but very difficult to treat. A positive family history of the atopic disease may be present

Clinical Features
Symptoms
Itchy eyes

Signs
Ring of pale, fleshy, pink-grey tissue around the cornea
Follicles on the tarsal conjunctiva (cobblestone type)

Treatment
Hydrocortisone 1% eye drops 3-4 times a day
Sodium cromoglicate 2% eye drops 5 times daily

9.2. TRACHOMA

Description
This is an infection of the eye caused by Chlamydia Trachomatis. It is a disease of the underprivileged communities, with poor hygienic conditions. The common fly is the major vector in the infection and re-infection cycle. It is one of the leading causes of preventable blindness in the world.

Characterized by an acute inflammation which appears in the first decade of life, slowly progressing until the disease becomes inactive during the 2nd decade of life. Last sequelae may not appear for many years.

Stages

- Trachoma Follicular (TF): characterized by follicles on the upper lid conjunctiva
- Trachoma intense (TI):, characterized by acute red tarsal conjunctiva with obliteration of blood vessel • Trachoma Scaring (TS): Tarsal conjunctiva starts showing lines of scaring

- Trachoma Trichiasis (TT): – upper eyelid turns in, because of extreme scarring and shortening of lid conjunctiva causing corneal damage and ulceration
- Ulcerated Cornea (CO): starts scaring forming corneal opacification

Clinical features
Symptoms

- None
- Red eyes
- Ocular discomfort

Signs
- Follicles on the tarsal conjunctiva
- Eyelid conjunctional scaring
- In-turning of eyelids (entropion)
- Eyelashes rubbing on the cornea (Trichiasis) heading to corneal ulceration
- Corneal scars

Treatment
WHO recommends adopting the SAFE strategy in proven endemic areas (after conducting the survey).

S Surgery for stage 5
A Mass Antibiotic treatment. A single dose of Azithromycin 500mg. In children 10mg/kg/bd/wt as start dose .
F Face washing (provision of clean and safe water – a multi-disciplinary approach where MOH partners with other line Ministries responsible for safe water as well as some international NGOs that fund this expensive aspect of Trachoma control.
E Environmental sanitation – It's a public health aspect of management

9.3. LUMPS AND BUMPS ON AND AROUND THE EYEBALL

These are lumps and bumps on ana around the eyeball and are divided into:
– Benign
– Malignant

Common ones
• Stye – KS (Kaposi Sarcoma)
• Chalazion (eyelid cyst)
– Squamous cell carcinoma of the
• Orbital dermoid cyst
– conjunctiva
• Pinguiculae Retinoblastoma
• Pterygia.

9.3.1. Stye

Description
This is a small abscess caused by an acute staphylococcus infection of a lash follicle

Clinical Features
Symptom
Painful lump on the lid margin

Sign
Tender inflamed nodule or lump on the lid margin

Treatment
- None – usually undergoes spontaneous resolution
- Hot compresses
- Removal of associated eyelash and drain the pus
- Tetracycline eye ointment may be applied to prevent eyeball infection.

9.3.2.Tarsal Cyst (Chalazion)

Description:
This is a cyst on the eyelid that results from blockage of the duct of tarsal glands. It is usually formed away from the lid margin.

Treatment
Incision and curettage (I & C).

9.3.3.Orbital Dermoid Cyst

Description
These are round, localized nodules or lumps in the upper temporal or upper nasal aspect of the orbit. They arise from a displacement of the epidermis to a subcutaneous location.

Types
(a)Simple type – not associated with body defect, these are superficially located
(b) Complicated – deeply seated, with deep intra-ocular extension. Present later in life with a displacement of the eyeball

Investigation
- X-ray skull
- CT Scan to rule out an intraorbital extension

Treatment
Surgery, total excision.

9.3.4. Pinguicula

Description
This is a yellowish-white growth on the bulbar conjunctiva adjacent to the nasal or temporal aspect of the limbus.
This type does not involve the cornea.

Treatment
- Leave alone, if asymptomatic
- If inflamed – red – Tetracycline 1% eye ointment 2 times a day for 7 days.

9.3.5. Pterygium

Description
These are conjunctival growths on the nasal or temporal conjunctiva that enlarge and encroach on the cornea. May cause a skin-like band over the cornea that may cover the pupil.

Clinical features
Symptom
May not cause any problem

May be discomfort of the eyeball if the pterygium is inflamed.

Sign
Redness of the conjunctiva growth that lies within the palpebral fissure.

Treatment
Local Excision in case of progression towards the visual axis.
Tetracycline 1% eye ointment if inflamed, post excision

9.3.6. Malignant

9.3.2.1. Kaposi Sarcoma of the Conjunctiva and Eyelid (See section on Malignancies)

Description
These are cancers arising from capillary endothelial cells. In the eye, they present clinically as a patchy or patches of elevated "haemorrhage" that do not resolve with time. It may be the first manifestation of AIDS. It may present on the conjunctiva or the eyelid.

Treatment
Referral to the nearest hospital (see the section on management of KS).

9.3.2.2. Squamous cell carcinoma of the conjunctiva

Description
This is a cancer of the eye arising from epithelial cells of the conjunctiva.

Clinical Features
It appears as a sessile or papillary growth on the intrapalpebral area of the perilimbal conjunctiva In immuno- compromised patients, the tumour is aggressive, with deep infiltration in the orbit and eyeball. Metastases occur to the preauricular and submandibular lymph nodes
The predisposing factor is the immunocompromised host.

Signs
Early:
Usually, nasal limbal fungating growth in the region of an underlying pinguicula or pterygium.

Late:
Huge fungating tumour of the orbit with metastases to local lymph nodes.

Treatment
Refer to the nearest eye specialist unit.

Early presentation:
Local excision with 2mm margin of the normal limbus.
May use local Mitomicin C (antimitotic)

Late presentation:
If the whole eyeball is involved with extension into the orbit, and vision is lost - total exenteration.
Chemotherapy - if systemically spread.
Poor response to radiotherapy.

Retinoblastoma
(see Oncology chapter).

9.4. COMMON EYE DISEASES ASSOCIATED WITH HIV/AIDS

Skin:

- Molluscum contagiosum of the eyelid
- Kaposi Sarcoma of the eyelid skin or conjunctiva
- Herpes zoster ophthalmicus
- Herpes simplex the eyelid skin
- Cornea Dendritic (Herpes simplex) corneal ulcers
- Fungal corneal ulcers
- Uvea Anterior uveitis - iritis
- Posterior uveitis - choroiditis or retinochoroiditis
- Pan uveitis
- Vitreous Candida vitritis
- Retinal vasculitis
- Cytomegalovirus Retinitis
- Neoplasia: Kaposi Sarcoma
- Squamous cell carcinoma
- Neuro-ophthalmic

- Intracranial infections by pathogens such as Cryptococcus neoformans and Toxoplasma gondii may cause ocular motor nerve palsies, papillary abnormalities, visual field defects and optic neuropathy

9.4.1. Moluscum Contangiosum

Description
This is a viral infection caused by the cytomegalovirus commonly affecting children. The typical lesion is a pale, waxy elevated nodule on the eyelids.

Clinical Features

Complications
The shedding of cell-laden with viral particles can produce chronic follicular conjunctivitis and superficial keratitis.

Treatment
Expression of the contents of the nodule
Heat cauterisation of the lesions.

9.4.2. Herpes Zoster Ophthalmicus

Description
This is an infection caused by the varicella-zoster affecting the ophthalmic division of the trigeminal vein. It is more common and more severe in patients with lymphomas and those being treated by radiotherapy or immuno-suppressed individuals.

Clinical Features
Symptoms
- Severe pain along the ophthalmic division of the trigeminal nerve VI)
- Maculopapular rash along the VI that obeys mid facial line.
- Swelling of the affected part of the face

Signs
- Typical Herpes Zoster rash

Complications
- Anterior uveitis
- Neurological: cranial nerve palsies
- Optic neuritis
- Encephalitis
- Contra-lateral hemiplegia
- Severe facial skin scarring
- Corneal opacification
- Neuropathic keratopathy
- Disciform keratopathy

Diagnosis
Clinical – the typical distribution of the Herpes Zoster rash

Treatment
- Oral acyclovir 800mg 5 times daily

- Oxytetracycline 3% + Hydrocortisone 1% eye drops OR
- Betamethasone 0.1% + Neomycin 0.5% eye drops OR
- Dexamethasone 0.1% + Chloramphenicol 1% eye drops 4-6 times daily
- Calamine lotion to the skin or Acyclovir 3% skin ointment
- ± systemic steroids (x-ray to rule out PTB) may activate TB in AIDS patients
- Acyclovir 3% eye ointment 5 times daily.

9.4.3. Cytomegalovirus Retinitis (CMV)

Description
This is a rare chronic diffuse exudative infection of the retina caused by the CMV virus which occurs with rare exception, in patients with an impaired immune system caused by either AIDS, cytotoxic chemotherapy or long term immune suppression following organ transplantation.

Clinical Features
Symptoms
- Poor vision
- Floaters

Signs
- Cotton wool spots
- Full-thickness retinal necrosis and oedema which starts peripherally or at the posterior pole
- Retinal bleeding
- Retinal vasculitis
- The whole retina eventually involved
- Total retinal atrophy
- Retinal detachment

Treatment
- Dihydroxypropoxymethyl guanine IV causes regression
- Ganciclovir IV infusion (induction) 5mg/kg 2 times a day for 12-21 days Maintenance dose 5 mg/kg wt daily until adequate recovery of immunity
- Foscarnet IV infusion, induction 60mg/kg every 8 hours for 2-3 weeks, then maintenance dose 60mg/kg daily increased to 90-120mg/kg if tolerated. If CMW progresses while on the maintenance dose repeat the induction dose. Treatment is needed for life

9.5. OPTICS & REFRACTION (REFRACTIVE ERRORS AND LOW VISION)

Description
This is a deficiency in the refracting mechanism of the eye resulting in poor vision. The eye is designed to be able to perceive the light that falls within the visible part of the electromagnetic spectrum. The two parts of the eye that are responsible for image formation are:

a) The Cornea – accounts for 2/3 of the refractive power of the eye.
b) The Crystalline Lens which accounts for 1/3 of the refractive power of the eye as well as for the accommodative capacity.

9.5.1. Refractive Errors

Types of refractive error:
- Myopia: - "short-sightedness"
- Hyperopia:- (Hypermetropia) : Long-sightedness
- Aphakia:- Poor vision that results from the absence of the crystalline lens
- Presbyopia:-Difficult in reading in the elderly (above 40 years) that results from loss of the accommodative power of the lens
- Astigmatism:- In this condition of the eye, the meridians of the eye are not equal, resulting in unequal refraction

Clinical Features
Symptom
Poor vision

Sign
Specific retinal reflex in line with the types of refractive error mentioned above on retinoscopy.

Refractive errors should be managed by optometrists, refractionists, and opticians, including sometimes ophthalmic clinical officers, ophthalmic nurses and ophthalmologists. After carrying out a visual acuity examination on a patient complaining of poor vision, if the VA is found below 6/12 in the better eye with maximum correction, the patient should be referred to the nearest eye specialist where further assessment and management of such a patient can be completed.

Treatment

- Glasses, contact lenses, or reflective surgery sometimes

9.5.2. Low Vision (VA range of 6/18 – 6/60)

Description

This is a failure to attain a visual improvement of more than 6/18 in the better eye after being given the maximum conventional treatment for poor vision. In such a patient further improvement of vision can be achieved by using low visual aids.

Treatment

The types of low visual aids available are:

- Optical – High power reading glasses, magnifies (illuminating and non-illuminating), telescopes, closed-circuit television sets.
- Non-optical – Environmental modification aimed at further enhancing the corrected residue vision such as:
  - improving lighting,
  - special reading stands,
  - painting of the staircases to improve contrast,
  - painting kitchen utensils for ease of identification,
  - special cheque signing cards,
  - talking watches, etc.

Refer such a patient to higher centers where appropriate aid can be provided.

9.6. STRABISMUS (SQUINT)

Description

This is ocular misalignment resulting from either an abnormality in binocular vision or anomalies of neuromuscular control of ocular motor motility. When eyes become dissociated (not aligned) then strabismus (squint) is present.

Orthophoria:

This is when the ocular motor apparatus is in perfect equilibrium so that both eyes remain aligned (i.e. directed on the fixation point) in all positions of gaze and at all distances of the fixation point even when the fusion mechanism is disrupted such as when one eye is occluded. Orthophoria – describes "essentially straight eyes.

Phorias:

These are latent deviations (latent strabismus or squint) or is a deviation kept latent by the fusion mechanisms.

Tropias:
Are manifest deviations. A deviation (squint) that is
manifest at all times and is not kept under control by the fusion mechanisms

Types of Strabismus (squint)

- Esotropia: -

The eye is rotated so that the cornea is rotated nasally.
This is also known as convergent horizontal strabismus

- Exotropia: -

The eye is rotated so that the cornea is rotated temporally (i.e. on the temporal side). This is also known as divergent horizontal strabismus

- Hypotropia: -

The eye is rotated about a transverse X-axis so that the cornea is rotated inferiorly (downwards). This is also known as vertical strabismus

- Hypertropia: -

The eye is rotated about the transverse X-axis so that the cornea is rotated superiorly (upwards). This is also known as vertical strabismus

Incyclotropia:
The eye is rotated about the sagittal Y axis so that the superior portion of the vertical meridian is rotated nasally and the inferior portion of the vertical meridian is rotated temporally. This is also known as torsional strabismus

- Excyclotropia:

The eye is rotated about the sagittal Y axis so that the superior portion of the vertical meridian is rotated temporally (on the temporal side of the face) and the inferior portion of the vertical meridian is rotated nasally (This one is also torsional strabismus)

Classification
Several methods of classifying eye alignments and motility disorders are used:
(1) Classification according to fusional status

- Phoria – a latent deviation in which fusion control is always present.

- Tropia – a manifest deviation in which fusion control is not present
- Intermittent – Fusion control is present at times

(2) Classification according to variation of the deviation with gaze position, or fixating eye.

- Comitant – a deviation does not vary with the direction of gaze or fixating gaze
- Incomitant – The deviation does vary with the direction of gaze or fixating eye. Most incomitant strabismus is paralytic, indicating either neurological or orbital disease.

(3) According to fixation :

- Alternating:

There is a spontaneous alteration of fixation from one eye to the other.

- Monocular – There is a definite preference of fixation with one eye.

(4) According to the age of onset

- Congenital – a deviation noted (documented) before age of 6 months
- Acquired – an ocular deviation noted and documented after the age of 6 months.

(5) According to the type of deviation

- Horizontal – Exo deviation or Eso deviation
- Vertical – hyper deviation or hypo deviation • Torsional – Incyclo deviation or excyclo deviation or
- Combined

Treatment

This requires a specialized assessment that starts with a careful history, clinical examination and treatment. Management requires the expertise of orthoptists working hand in hand and under an ophthalmologist to treat these unsightly ocular deviations.

A squinting child or an adult has an underlying problem that is responsible for the deviation. It could be an abnormality of binocular vision or anomalies of neuromuscular control of ocular motility. Some, if not all are treatable provided these patients are referred and corrected early in life.

All squinting children should be referred to a specialist, preferably centers that have Ophthalmologists.

9.7. SYSTEMIC EYE DISEASES AND THE EYE

9.7.1. Hypertensive Retinopathy

Description

The primary response of retinal arterioles to hypertension is narrowing. In sustained hypertension, there is a disruption of the blood-retinal barrier resulting in increased vascular permeability. The fundus picture of hypertensive retinopathy is characterized by vasoconstriction, leakage and arteriosclerosis.

Severe hypertension may lead to obstruction of the precapillary arterioles leading to the development of cotton wool spots. Abnormal vascular permeability leads to the development of flame-shaped haemorrhage, retinal oedema and hard exudates. The deposition of hard exudates in the macular area may lead to their radial distribution in form of a macular star. Swelling of the optic nerve head is the hallmark of malignant hypertension. Arteriolar sclerotic features are due to thickening of the blood vessel wall. The single most important clinical sign is the presence of marked changes at the arteriolar venous crossings.

Grading of Hypertensive retinopathy

Grade I: Mild generalized arteriolar constriction. Broadening of the arteriolar light reflex and vein concealment.

Grade II: More severe generalized as well as focal arteriolar constriction and deflection of veins at arteriolar/venous crossings.

Grade III: Flame-shaped haemorrhages, cotton wool spots, hard exudates, copper-wiring of arterioles, banking of veins distal to the arteriolar/venous crossings and right-angled deflections of veins.

Grade VI: Disc swelling and silver wiring of arterioles.

Treatment

Medical, Control of hypertension

9.7.2. Retinal Vein Occlusion

Systemic hypertension is associated with an increased risk of both branch retinal vein occlusion and central retinal artery occlusion.

Treatment

- No effective treatment
- Control the hypertension
- refer to an ophthalmologist

- Some patients develop secondary retinal neovascularization which requires pan-retinal laser photocoagulation (Ischaemic type of central retinal vein occlusion)

9.7.3. Retinal Artery Occlusions

The patient may suffer attacks of amourosis fugax (transient absences of vision) or frank retinal artery occlusion as a
result of the associated arteriosclerosis

Treatment
Requires urgent management

- the patient should lie flat
- Firm Ocular massage – to lower intraocular pressure, and increase retinal blood flow
- Intravenous Acetazolamide 500mg start to further lower the intraocular pressure
- Inhalation of a mixture of 5% Carbon dioxide and 95% Oxygen and anterior chamber paracentesis.

Unfortunately, the results of the treatment are usually disappointing.

9.7.4. Ocular motor palsies

Ocular muscle palsies may be found in patients with hypertension, even though hypertension is not the only cause of ocular muscle palsies. There are other causes like diabetes mellitus.

Treatment
Medical, control of hypertension
May undergo spontaneous resolution

9.7.2 Dysthyroid Eye disease

Description
Dysthyroid eye disease is a syndrome of clinical and orbital imaging abnormalities caused by deposition of mucopolysaccharides and infiltration with chronic inflammatory cells of the orbital tissues, particularly the extraocular muscles.

Clinical Features

In general, the ocular features of Grave' disease and ophthalmic euthyroid graves' disease are similar, although they tend to be more asymmetrical in the latter stages.

Signs
Eyelid signs:
- Lid retraction
- Lid lag

Signs resulting from infiltrative ophthalmopathy
- Conjunctival injection (redness)
- Chemosis (swelling)
- Superior limbic conjunctivitis
- Proptosis
- Optic neuropathy whose early sign is colour desaturation
- Restrictive myopathy

Treatment
- Non-specific (reassurance, head elevation to reduce the severity of periorbital oedema, taping of eyelids at night to protect the cornea, prismatic glasses to reduce diplopia, diuretics such as Cyclopenthiazide 0.5mg at night to reduce morning periorbital oedema.
- Hypromellose 0.3mg (artificial tears) or SNO tears
- In severe cases, Prednisolone 80-100mg/day, enteric-coated and after 48hrs taper by 5mg every 5th day. Treat for a maximum of 2-8 weeks and stop at 3 months
- Radiotherapy – used for patients who have systemic contraindications to steroids, refuse steroids develop serious steroids side effect or a steroid resistance.
- Dose – 20gy to the posterior orbit given for over a

10 day period

The response is usually evident within 6 weeks and maximum improvement evident by 4 months.
- Orbital decompression; if the patient develops severe exposure keratopathy, optic neuropathy or cosmetically unacceptable proptosis
- Surgery on Eyelids

–Tarsorrhaphy in uncontrolled exposure keratopathy
–To weaken muller's muscle for a patient with severe lid retraction.
–Blepharoplasty

9.7.5. Diabetic Retinopathy

Background

- Maculopathy
- Preproliferative
- Proliferative

Advanced diabetic eye disease

- Cataract
- Accelerated senile
- True diabetic
- Ocular Motor nerve palsies
- Abnormal pupillary reactions
- Changes in refraction

a) Diabetic Retinopathy (DR)

The overall prevalence of retinopathy in diabetic patients is about 25%. In non-insulin-dependent diabetics (NIDDs), the prevalence is 20% while in insulin-dependent diabetics, it is about 40%.

Predisposing factors (risk factors)

- The incidence of diabetic retinopathy is closely related to the duration of diabetes. (generally more likely after 5 years' onset of diabetes mellitus.
- Control of diabetes – poorly-controlled patients develop the complication sooner than those well controlled.
- Pregnancy
- Hypertension
- Renal disease
- Anaemia

b) Background diabetic retinopathy (BDR)

Clinical Features

Signs

Mircroaneurysms at the posterior pole, temporal to the macula.

- Dot and blot haemorrhage
- Hard exudates
- Diffuse retinal oedema

Treatment

- Treat associated high Blood pressure, anaemia, renal failure
- Monitor patients annually by retinal examinations. In some patients, spontaneous regression occurs when diabetes is well controlled

c) Diabetic Maculopathy – results from macular oedema and hard exudates

Clinical Features
Symptoms
Gradual impairment of central vision
Difficult in reading small print

Signs
Features of BDR, plus foveal.
oedema, or foveal hard BDR, plus foveal oedema,
exudates

Treatment
Refer to Ophthalmologist
Laser macular grid
d) Preproliferative diabetic retinopathy (PPDR)

Clinical Features
Signs
- cotton wool spots
- Intraretinal microvascular angiopathies and segmentation
- Arteriolar narrowing
- Large blot and dot haemorrhages

Treatment
Refer to specialist

e) Proliferative diabetic retinopathy (PDR)

Clinical features
Signs
- Early neovascularization is seen on the disc, or elsewhere on the retina
- Late elevated new vessels, associated with a white fibrosis component.

Treatment
- Urgent referral to Ophthalmologist because they require Pan retinal photocoagulation

f) Advanced Diabetic eye disease

Clinical Features
Symptoms
- Sudden onset of floaters
- Blurred vision from vitreous haemorrhage

Signs
- Dense Vitreous Haemorrhage
- Tractional retinal detachment
- Neovascular glaucoma

Treatment
Surgery
- Vitrectomy with endolaser photocoagulation

9.8. OCULAR EMERGENCIES

9.8.1. Absolute Emergencies

- Chemical injury to the eye
- Cornea Laceration
- Hyphaema (Traumatic) absolute

9.8.1.1. Chemical Injury to the Eye (See section under Red-eye with pain).

9.8.1.2. Cornea Laceration

Description
Laceration if the Cornea

Clinical Features
Symptoms
- History of injury, Always ascertain the mode of injury
- Loss of vision following trauma
- Bleeding from the eye

Signs
- Obvious corneal laceration visible on direct light -examination of the eye
- Prolapsed iris is seen plugging the laceration
- The anterior chamber is flat with blood
- Eyeball is soft

Diagnosis

- Examining under local anaesthesia lignocaine 2% eye drops, gently examine the eye under full aseptic condition. The aceration will be visible.

Treatment
Early Management
- Tetanus Toxoid
- IM or IV Gentamycin 80mg start, or cefotaxime 1gm stat.
- Chloramphenicol 1% eye drops or Gentamycin 0.3% eye drops to affected eye start
- Light dressing (padding) of the affected eye
- Refer to a specialist.

Specialist Management
- Under lignocaine 2%, examine the eye gently to ascertain the wound shape.
- Exclude retained intraocular foreign body (x-ray or ultra-sound)
- Arrange for emergency repair, preferably under general anaesthesia.
- Suture the laceration under a microscope
- Reform the anterior chamber
- Sub-conjunctival injection of gentamycin o.3ml + atropine 0.3ml + dexamethasone, 0.3ml
- Gentamycin, 0.3% eye drops 2 drops 4 times a day, or Chloramphenicol 1% eye drops 2 drops 4 times a day and keep eye padded.

9.8.1.3. Traumatic Hyphaema

Description
This is blood in the anterior chamber as a result of trauma, or very rarely spontaneous. If spontaneous, rule out intraocular malignancy or juvenile xanthogranuloma.
Clinical Features
Symptoms
- History of injury, usually blunt type of trauma
- Poor vision

Signs
Blood clots visible in the anterior chamber.

Treatment

- If the patient is a child admit in hospital and keep under observation. If left unattended, chances of a re-bleed are high resulting in intraocular pressure elevation and corneal staining
- If the anterior chamber is 1/3 full in an adult, can treat as an outpatient
- If the anterior chamber is full or 2/3 full, admit the patient
- Bed rest
- Betamethasone, or Dexamethasone 0.1% eye drops four times a day
- Induce cycloplegia, with Tropicamide 1% eye drop twice daily or Atropine 1% eye drop once daily
- If intraocular pressure is elevated, use antiglaucoma drops, preferably Timolol 0.5% two drops or oral Acetazolamide 250mg tablets 4 times daily
- Use topical antibiotic to prevent or treat the associated infection
- Chloramphenicol 1% or Gentamycin, 0.3% eye drops

9.8.2. Relative Emergencies

- Congenital cataract
- Retinal detachment

Refer to the Specialists early.

9.9. GLAUCOMA

Description
This is a group of diseases in which the intraocular pressure is sufficiently elevated to damage vision

Types
(i)Primary
(ii)Secondary
(iii)Congenital

9.9.1. Primary angle closure (congestive) Glaucoma

(See the section on Red-eye with Pain)

9.9.2. Primary open-angle glaucoma

(chronic simple glaucoma)

Description
This is a prolonged increase in ocular pressure. The result is complete damage to the optic nerve.

Clinical Features
Symptoms
- Usually asymptomatic

Signs
- Gonioscopy – normal angle
- on Tonometry, Intra-ocular-pressure (IOP) will be raised, above 25mmHg
- Optic nerve cupping
- Visual field – trachoma type of visual field loss
- Late - When blind – Optic atrophy

Investigations
- perimetry – Peripheral visual field analysis, either by confrontation or using Peripheral visual field analyzer
- Tonometry – Perkins or Goldman
- Gonioscopy – Normal angle
- Fundoscopy – optic disc cupping

Treatment
1st Line
Timolol maleate 0.25% or 0.5% twice daily
Rule out underlining cardiac or pulmonary malfunction

2nd Line
Pilocarpine 2% or 4% eye drops 4 times daily
Dipivefrine 0.1% eye drops twice daily

3rd line
Latanoprost 50 micrograms/ml once or twice daily
Acetazolamide 250mg (slow release) tablet once daily. Use only for a short while.

Treatment is for life as long as the compliance stays good and as long as intra-ocular pressure is controlled. Ocular association of Primary open-angle glaucoma (POAG) (recommend to rule out glaucoma in any of these conditions:)

- High myopia
- Retinal vein occlusion
- Retinal detachment
- Pigmentary Retinopathy of retinitis pigmentosa type

Systemic associations
- Diabetes Mellitus
- Dysthyroid ophthalmopathy

Current practice recommends surgery as 1st line management because of poor compliance of treatment for life. Trabeculectomy (Filtration surgery) ± use Mitomycin C.

DO NOT DISCHARGE PATIENT. SEE AT LEAST TWICE YEARLY.

TO SAFEGUARD AGAINST SECONDARY CLOSURE OF THE FILTRATION BLEP.

9.9.3. Primary Congenital Glaucoma

Description
This is intraocular pressure elevation in a child, that manifest either at birth or a few years after birth due to a developmental anomaly of the formation of the eye anterior chamber angle.

Clinical Features
Symptoms
- Lacrimation (usually mistaken for lacrimal duct closure
- Light intolerance

Signs
- Large eye – Buphthalmos
- Misty looking cornea
- Haab's striae on the cornea (on slit-lamp microscopy)
- Cuped disc

Investigation
- Corneal diameters (7 – 11mm) 16 over 11mm, a reason to be suspicious
- Refraction: myopic
- Tonometry – Intraocular pressure will be high

- Fundoscopy – varying degrees of cupping

Treatment
- Surgical – Trabeculectomy
- Goniotomy

9.9.3.1. Secondary glaucomas

Description
These are glaucomas that are secondary to an underlying cause.
Treatment
Refer to eye specialist services.

10. ANAEMIA AND NUTRITIONAL CONDITIONS

10.1. ANAEMIA

Description

This is a reduction in the haemoglobin concentration in an individual to below the normal range for that individual's age and sex.

The normal haemoglobin concentration ranges are as follows:

Male adults	*130 – 180g/L*
Female adults (Non pregnant)	*120 160g/L*
Children	*135 – 195g/L*
Birth (full term)	*+/- 30*
6 weeks	*110 – 170g/L*
2 - 6 months	*115 – 155g/L*
2 - 6 years	*110 – 140g/L*
7-12 years	*110 – 150g/L*

Anaemia is not a diagnosis in itself as there is always an underlying cause, which must be determined before the anaemia can be properly treated. Anaemia is most often detected by measuring the haemoglobin (Hb) concentration of the blood.

In the management of anaemia, one must obtain a detailed history from the patient or caregivers, examine the anaemic patient carefully and perform the appropriate investigations with a view of:

1.Establishing that the patient is anaemic

2.Establishing the type of anaemia the patient has

3.Determining the cause of the anaemia

4.Determining whether or not complications are arising from the anaemia, the cause of the anaemia or both.

The history obtained from the patient or caregivers often gives very important information for making an appropriate diagnosis.

Once the type of anaemia and its cause have been established, appropriate treatment can be given and, where possible, the underlying cause corrected or removed.

One principal function of the red blood cells is to carry oxygen from the lungs to all other areas of the body and this function is performed by the haemoglobin. The haemoglobin, found in the red blood cells, binds to oxygen in the lungs and the haemoglobin bound oxygen is transported to other organs where is it released. When the haemoglobin concentration is low, the oxygen-carrying capacity of the blood is reduced and thus the amount of oxygen reaching other organs is also reduced. In anaemic states, the body will thus react in such a way as to try to maintain the levels of oxygen reaching the organs.

Clinical features

The clinical features of anaemia are directly due to the lowered haemoglobin concentration and are therefore common to all types of anaemia irrespective of the cause.

Symptoms

- Tiredness, weakness, dizziness, shortness of breath and headache, palpitations visual disturbances

Signs

- One general sign of anaemia is pallor of the mucous membranes, and nail beds, However, this sign is unreliable as it can be masked by other conditions such as jaundice and conjunctivitis.
- Other signs will be of either the underlying cause e.g., bruising of the skin in aplastic anaemia or the effects of anaemia such as heart failure.

Classification of Anaemia

There are several methods of classifying anaemia but the most common is based upon the cause of the anaemia. Anaemia can result from:

1. Poor production of red blood cells
2.Increased destruction of the red blood cells
3.Increased loss of red blood cells from the body

Anaemia that arises from poor production of red blood cells include:

- Nutritional deficiency anaemias such as iron, folic acid and vitamin B12 deficiency anaemias, anaemia of chronic illness and bone marrow failure syndromes such as aplastic anaemia, invasion of the bone marrow by cancer, infection in the bone marrow
- Anaemias arising from increased red blood cell destruction include sickle cell anaemia, infections such as malaria, auto-immune haemolytic anaemia, G-6-PD deficiency. Increased blood loss may result from parasitic infestations such as hookworm, and schistosomiasis, heavy menstrual loss and surgical conditions such as bleeding peptic ulcers.

Nutritional anaemia

Iron deficiency anaemia

Iron deficiency anaemia is by far the most common type of anaemia in the world. Hookworm infestation and schistosomiasis not only cause anaemia by whole blood loss but they are also leading causes of iron deficiency in developing countries. Iron deficiency may also arise from poor dietary intake, malabsorption or increased demands as in pregnancy

Folic acid and Vitamin B12 deficiency

Deficiency of either or both of these micronutrients results in anaemias characterised by larger than normal red blood cells (megaloblastic anaemias). Megaloblastic anaemias may arise from increased demands for the micronutrients as may occur in pregnancy and lactation, haemolysis, poor dietary intake particularly in absolute vegetarians (Vit B 12) and malabsorption

Diagnosis

- FBC, peripheral smear
- Urinalysis + Microscopy
- Stool for occult blood, ova and parasites
- Other investigations will be dependent on the clinical , evaluation of the patient

10.1.1. Treatment of nutritional anaemia

Drugs

Ferrous Sulphate, Adults 200mg 3 times a day after meals until the Hb has reached the normal range. Continue with 200mg daily for 6 months to build up iron stores.

Children up to 1 year:
Ferrous Sulphate 9-18mg of iron daily (0.75ml-1.5 ml mixture).

1-5 years:
100-150mg daily (10-15ml mixture daily) in divided doses. 6-12 years: 200mg 3 times a day.
For prophylaxis 200mg 3 times daily
Iron Dextran injection to be used in a hospital under the direct supervision of a doctor. It is not superior to oral iron and is used only when patients cannot tolerate oral therapy.
Folic Acid 5-10mg daily for as long as required. Vitamin B12 (Hydroxocobalamin) injection, initially 1mg I.V. repeated 5 times at intervals of 2-3 days. Maintenance dose 1mg every 2-3 months. Lifelong treatment may be required.

10.2. MALNUTRITION

Description
Malnutrition is a term that covers a wide range of clinical conditions in children and adults causing impairment of health. It results from a deficiency or an excess of one or more essential nutrients. Malnourished individuals are prone to infections and in children, it causes poor growth.

In pregnancy, poor nutrition results in the birth of low weight babies.

Protein Energy Malnutrition (PEM)
This is the commonest form of malnutrition in children below 5 years of age. It is a result of deficiencies in any or all nutrients (macro and micronutrients) The first sign is the loss of weight or failure to gain weight. The children under-five card helps us to detect this form of malnutrition at the clinic through growth monitoring.

There are three main clinical syndromes:
1. Kwashiorkor
2. Marasmic-kwashiorkor
3. Marasmus

Underweight represents the mildest form of malnutrition while kwashiorkor, marasmus and marasmus-kwashiorkor represent the severe forms and require admission in the health centre or hospital for treatment.

Underweight Marasmus

Kwashiorkor 70-60% Marasmic-Kwashiorkor with oedema Marasmus Below 60% without oedema

The child has gross muscle wasting, no subcutaneous fat, has a hungry and anxious look.

Kwashiorkor 80-60%
The child shows oedema, flaky paint rash; thin, pale sparse easily pluckable hair, apathetic, anorexic, moonfaced. Big fatty liver on palpitation

Marasmic-kwashiorkor 60-70%
Wasted body but also has oedema. This is severe malnutrition and usually requires admission in the health centre or hospital for treatment.

Treatment
For patients with very severe malnutrition, including its complications, admit to hospital and treat with F75 and F100 as nutritional replacement feeds. Patients with mild or moderate disease can be treated at the community level using RUFT (plumpy nut).

Procedures on admission
1.Weigh the child
2.Record temperature (rectal), pulse, respiration rate
3.Check blood sugar (Dextrostix)
4.FBC/ESR, electrolytes, urea, serum protein/albumin, sugar and MP
5.Stool and urine
6. Mantoux, CXR

Resuscitation

a) Resuscitation first 4-7 days. Most deaths occur in this period.
b) Generally keep warm with heater and hot water bottles.
– Do not give a bath
– Nurse away from windows
–Adequate covering during the night (most kwashiorkor babies die at night).
c)Start feeding immediately after admission with F75.

Oral:
Use a cup and spoon. For a very sick and anorexic child, careful continuous nasogastric tube feeding can be used.

Milk Diet:
100ml/kg increasing to 150ml/kg in 7 divided doses.

The milk diet is made from:
Dried skimmed milk 120g
Sugar 30g
Oil 35g
Electrolyte solution 30 ml

Add cooled boiled water slowly up to 1 litre. Stir well.

Electrolyte Solution made up of:
Potassium chloride 90g
Magnesium hydroxide 9g
Cooled boiled water 100ml

Only 30ml of the Electrolyte solution is used for each litre of milk diet made.

d)Rehydration, severe dehydration can be present despite oedema.

Give half-strength Darrow's with dextrose, 20ml/kg in the first hour. 20ml/kg over the next 2 hours, followed by 5 – 10ml/kg per hour depending on the severity of the dehydration.

In less severe dehydration and when an IV line is not possible, give ORS, 50-80ml/kg over 4-6 hours followed by milk diet.

e) Drugs Potassium:
6 mEq/kg per day for 2 weeks or more, particularly in a child with chronic diarrhoea. Give potassium as potassium citrate, or potassium chloride.

Magnesium sulphate 25% IM 0.2g for 3-5 days,
Vitamin A 6 drops (30.000 IU) stat followed by one drop (5.000 IU) daily given with water or milk. If there are signs of keratomalacia give 1ml or 30 drops (150.000 IU) orally stat.

Folic Acid 5 mg daily
Vitamin K injection 5mg stat on admission

Antibiotics: Gentamycin
Multivitamin syrup

Note: Iron-containing syrup should be avoided in the acute phase of malnutrition.

Complications
1. Hypothermia:
With temperature below 35.5 ^{0}C, mortality doubles. Warm up the child. Monitor temperature every hour until the temperature reaches 37 ^{0}C, then take every 4 hours.
2.Hypoglycaemia:
If blood sugar is below 2.2mmol/l (or below 2.5mmol/1 by dextrostix) mortality increases by about 4 times. May be asymptomatic.

Treatment

- Dextrose 25% IV 2ml/kg or dextrose 50% 1ml/kg followed by IV drip of 10% dextrose 75ml/kg/day. Reduce gradually as the blood sugar stabilises.
- Monitor blood sugar with dextrostix 4 hourly until normal and stable.
- Heart failure: May be precipitated by severe anaemia or excessive fluids given IV or orally. This condition is common in the second week of treatment.

Complications
Suspect heart failure if oedema disappears but weight is constant, or sudden rapid weight gain, or increase of pulse. Check size of the liver.

Treatment (heart failure)

- Diuretic (Furosemide 1mg/kg).
- Blood transfusion to anaemic children (4-6 g%), 20ml/kg slowly. If CCF present, Hb below 4 g/dl give 10ml/kg or packed cells slowly.
  Convulsions: Diazepam to stop convulsions. Do Lumbar Puncture, dextrostix, electrolytes and Blood Slide.

Diarrhoea: Check stool for reducing sugars. If positive, change to lactose-free milk.

If there is no evidence of reducing sugars in stool continue with a milk diet.
Treat any parasites, e.g. giardiasis.

- Metronidazole 100mg 3 times daily for 5 days
- Mebendazole 100mg 2 times daily

Rehabilitation
2-6 weeks of gradually increasing the energy and protein intake to 200-300 kcals/kg per day (normal requirement 100-110 kcals per day) and protein 4-5 g/kg per day (normal requirement 2g/kg per day).
As soon as the child wants food put on a normal diet in addition to his full requirement of milk diet.

10.3. VITAMIN DEFICIENCIES

Vitamins are compounds needed in small quantities for the operation of normal bodily metabolism. The vitamin requirements may be increased during disease and fevers. Vitamin deficiency may appear as single or combined conditions. Multivitamin preparations will cover mild deficiencies of a combined nature. Vitamin B complex preparations will often cover most of the vitamin B deficiencies.

Note that a diet with sufficient fruit and vegetables will prevent most vitamin deficiencies.

10.3.1. Vitamin A

Sources of Vitamin A: Mangoes, pawpaw, carrots, spinach, cod liver oil.
Deficiency leads to:

- Dryness of conjunctiva (Xerosis)
- The scariness of the skin and sometimes acne
- Keratisation of the cornea, cortical opacity and blindness
- Inability to see easily in the dark (night blindness),
- Softening of the cornea (keratomalacia) often followed by cortical perforation and panophthalmitis.

Treatment

- Children with severe malnutrition, give one age-specific dose (see under malnutrition above)
- Children with diarrhoea for more than 3 days and children with measles give one dose

Prevention

- 6 - 11 months give 100,000 i.u. once
- 12 - 72 months give 200,000 i.u. once every six months

10.3.2. Vitamin B group

a) Vitamin Bl
May cause neuropathy in adults and cardiac failure in babies (Beri-beri)
b) Vitamin B2 (Riboflavin).
Deficiency causes mucocutaneous lesions such as angular stomatitis, sore cracked lips, and glossitis
c) Nicotinic Acid.
Deficiency leads to pellagra, a disease common in adults and recognisable by the so-called "3 Ds":
- Dermatitis:

Skin developing a cracked, pigmented scariness in the areas exposed to sun or mechanical irritation.
- Diarrhoea:

Gastrointestinal symptoms of loose watery stools.
- Dementia:

Neurological symptoms, usually severe in adults but showing as apathy and irritability in children.

Treatment
- Vitamin B1 25 – 100mg i.m. or orally
- Vitamin B2: 5 – 10mg daily
- Nicotinamide 100-300mg daily
- Until symptoms disappear

10.3.3. Vitamin C (Ascorbic acid)

Sources of ascorbic acid: Oranges, lemons, green vegetables. Deficiency leads to scurvy, a disease recognised by:

Clinical features
Signs and Symptoms
- Periodontal haemorrhage
- Swelling and pain of long bones due to sub- periodontal haemorrhage
- Loosening of teeth and lesions of the gums

- Leading to infections in the mouth.

Treatment
- Vitamin C tablets (Ascorbic acid) 200mg 4 times daily.
- Until symptoms disappear.

10.3.4. Vitamin D

Sources of vitamin D: Milk, butter, eggs, cod liver oil. It is normally formed in the skin from sunlight.

Clinical Features
Signs and Symptoms
Deficiency leads to rickets, recognised by:
- Softening of bones resulting in bowing of legs or knock-knees.
- Thickening of the ends of bones.

Treatment
- Vitamin D, 1000-5000 units/day orally for a period of 6 weeks to 3 months.
- Exposure to sunlight

Prevention
- Prevention of malnutrition requires the administration of a variety of foods providing a balanced or mixed diet to satisfy the individual nutritional needs.

Guidance concerning locally produced foods of the different food groups is important. People should be educated on the importance of eating regular nutritious meals including fruits and vegetables.

Pregnant women Encouraged to:
- Eat a well-balanced diet. (enough quantity of foods daily to meet her daily energy and enough critical nutrients needs, comply with the micronutrient supplement – Essential nutrition)
- Have extra rest especially during the third trimester.
- Space their pregnancies (child-spacing 3yrs) adequately through the use of family planning methods. And must know their HIV status to safely breastfeed her child

Infant and Young Children
- Initiate breastfeeding within an hour of birth

- Exclusively breastfeed for the first 6 months

A timely introduction to complementary feeding (from 6 months with continued breastfeeding up to 24 months and beyond) and follow complementary feeding guidelines (Frequency of feeds according to the age group, density, utilization of food by vitamins and active feeding) after 6 months with continued breastfeeding until 18-24 months. To the porridge should be added protein foods e.g. legumes (beans, peas, groundnuts), fish, meat.

- Pre-school children should be fed 4-5 times a day

- Children should be fed even when they are sick
- Children should be given fruits and vegetable regularly
- Encourage immunisation

For episodes of diarrhoea in breastfed young children intensify breastfeeding for and promote the use of ORS according to the severity of the diarrhoea. Early detection of children developing malnutrition (not gaining weight or loss of weight) and institutional high protein and high-calorie diet.

10.4. VULNERABLE GROUP FEEDING

The supplementary rations given to selected vulnerable or at-risk groups to make up for deficiencies in the diet should be instituted temporarily. Meanwhile, permanent home-based ways to make the diet adequate should be sought.

11. DERMATOLOGICAL CONDITIONS

These are classified according to the cause of infection or infestation:

- Bacterial infections
- Fungal infections
- Viral infections
- Parasitic infestations

11.1. BACTERIAL INFECTIONS

Description

This is a condition caused by blocked sebaceous glands. It usually begins at or after puberty. The most affected parts are the face, neck, back and chest.

Clinical features

Occurs in mild form as blackheads and whiteheads (closed comedones and open comedones) and more severe form as nodular lesions, with or without infection

Treatment

Drugs

- Benzoyl peroxide gel 2.5-10% topically 1- 2 times daily
- Doxycycline, 50-l00mg orally daily for 6 weeks in severe cases

Supportive

- Wash the affected parts with carbolic soap and water 2 to 3 times daily
- Avoid the use of cosmetics
- Diet should include plenty of fruits and vegetables
- Avoid fatty foods

11.1.2. Abscess

Description

This is a collection of pus in the dermis and subcutaneous fat layer of the skin. It occurs as a result of infection of the hair follicles commonly caused by Staphylococcus aureus.

Clinical features

The skin surrounding the affected hair follicle becomes red, hot, swollen and tender to touch. In severe cases, there will be fever and involvement of the local lymph nodes

Treatment
Drugs

- Cloxacillin, adults; 250 - 500mg orally. 6 hourly for 5 days, children; 125 - 250mg orally 6 hourly five days or
- Erythromycin, adults; 250 - 500mg orally 6 hourly for 5 days, children; 125-250mg orally 6 hourly for 5 days

Surgery

- Incision and drainage
- In cases of multiple abscesses, non-response to antibiotic therapy or an abscess in a diabetic, refer to a specialist

Supportive

- Encourage patient to maintain good general hygiene
- Apply hot compression 3-4 times daily until abscess *f* is ready for draining.

11.1.3. Impetigo

Description
This is a superficial infection of the epidermal layer of the skin by aureus commonly but Streptococcus species may also be involved. Painful vesicles and pustules break down to form scabs or crusts. Impetigo starts on the face and may spread to the neck, hands and legs. It usually occurs in children.

Treatment
Drugs

- Cloxacillin, orally, adults; 250 - 500mg 6 hourly for
  5 days, children; 125 -250mg 6 hourly for 5 days or
- Erythromycin, orally, adults; 250 - 500mg 6 hourly for 5 days, children; 125 -250mg 6 hourly for 5 days

Supportive

- Keep fingernails short
- Soak and clean pustules with water and soap
- The patient should be referred to the next level if there is no improvement after 2 weeks

11.1.4. Eczema

Description
Eczema is an inflammatory rash which may be due to endogenous or exogenous factors.
Classification of Eczema:
• Endogenous
–Atopic (inherited disposition)
–Seborrhoeic
–Asteatosis
–Discoid (nummular)
–Unclassified
• Exogenous
–Allergic contact dermatitis
–Primary irritant dermatitis
–Photo dermatitis

11.1.4.1. Atopic eczema

Description
This is a condition characterised by an itchy, rough, dry skin. In babies, it occurs mainly in the areas surrounding the knees, elbows and neck whereas in older children and adults it can occur on any part of the body. The itching is intense at night and could become chronic and infected. Where possible the causative factor should be determined before commencing treatment.

Treatment
Drugs
- Aqueous cream, topically 1-3 times daily after bathing or
- Zinc oxide cream, topically 1-3 times daily after bathing
- Betamethasone 1%, topically twice daily for 7 days
  (for severe or non-responsive cases) or
- Hydrocortisone in, topically twice daily for 7 days
- Zinc and Coal Tar Paste, topically 1 -2 times daily (in chronic cases)
- Chlorpheniramine 4mg 2 times a day
- Erythromycin 500mg 4 times a day for 7 days

Supportive
- Keep fingernails short
- Keep skin hydrated with Oil bath
- The patient should avoid scratching

- Avoid exposure of affected parts to sunlight
- Avoid known irritants e.g. soap, woollen clothing. If there is no improvement in the acute condition after 2 weeks refer to a specialist.

11.1.4.2. Seborrhoeic eczema

Description
This is a condition characterized by thick adherent scales presenting as a diffuse scaly scalp (dandruff). It may also affect other parts of the body which tend to be oily e.g. facial skin nasolabial folds, eyebrows, eyelashes, external ears, and centre of the back. Variable pruritis and vesicular or scaly lesions may be present.

Infantile seborrhoeic eczema occurs in early infancy 24 weeks after birth. Begins with cradle cap (scaly scalp surrounding the anterior fontanelle), spreads to the face, axilla, neck and nappy area. The rash is non-itchy and gets better without leaving marks.

Treatment
Drugs
- Hydrocortisone 1% cream, topically twice daily; Maintenance; once or twice a week as required
- Zinc oxide cream, topically 1-3 times daily after bathing especially in the nappy area or
- Aqueous cream, topically 1-3 times daily after bathing.

To reduce scaling and itching of the scalp use keratolytic or antifungal containing shampoos once or twice weekly. Refer patients who do not respond to treatment or have acute oozing eczema to a specialist.

11.2. FUNGAL INFECTIONS

Superficial fungi live in the stratum corneum and feed on the keratin. They are called dermatophytes and belong to 3 genera as follows: Microsporum, Trichophyton, and Epidermophyton, respectively. More than 40 species are currently recognized with 10 causing human infection. They are transmitted from person to person by direct body contact or by fomites e.g. combs. They can also be transmitted from animals such as cats and dogs(zoophilic) or from the soil and plants (geophilic) The infections are named according to the body parts affected as follows:
- Tinea pedis – feet

- Tinea corporis – body
- Tinea capitis – scalp and hair
- Tinea manus – hands
- Tinea unguium – nails
- Tinea cruris – groin area covering the T of the genital area extending behind
- along the gluteal cleft
- Tinea facialis – face
- Tinea barbae – beard area
- Tinea versicolor
- Cutaneous candidiasis

11.2.1. Tinea pedis (athletes foot)

Description
This is a contagious fungal infection of the foot caused by Trichophyton mentagrophytes and T. rubrum most commonly.

Clinical features
- Itching of the foot
- Burning or stinging lesions with scaling borders between the toes
- Vesicular eruptions with white scaling between the 4^{th} or 5^{th} toes or the instep of the sole
- May be accompanied by vesicles on the palms and sides of fingers called 'id' reaction. The vesicles do not contain fungus and get better when the fungus is treated

Diagnosis
Scrape the scales from the infected site and put on a glass slide with a drop of 20% KOH. On microscopy branching, fungal hyphae are seen.

Treatment
Drugs
Miconazole 2% cream, topically twice daily
Continue treatment for 2 weeks after the symptoms have cleared.

Supportive
- Keep feet dry all the time
- Wear open footwear
- Wear cotton socks, if need be
- Change socks daily

11.2.2. Tinea corporis (ringworm of body, trunk and limbs)

Description
This is a condition which can be acquired from animal (Trichophyton verrucossum, Microsporum canis) or human contact (T. rubrum). It is characterised by itchy lesions appearing as scaly greyish patches with raised borders. It can affect any part of the body, with the most commonly affected parts being the arms, groin, buttocks, waist and the area under the breasts.

Treatment
Drugs
- Miconazole cream 2%, topically twice daily for 2 to 6 weeks.
- Fluconazole 200mg O.D. oral for 6 weeks
- Griseofulvin 500mg O.D. oral up to 2 weeks after lesions disappear

Supportive
- Maintenance of general hygiene
- Avoid sharing of personal items such as towels and clothes.

11.2.3. Tinea capitis (scalp ringworm)

This is a fungal infection of the scalp which is especially common in children. It is caused by Trichophyton species – violaceum in Africa and Asia, T. rubrum in Europe. Non-inflammatory invasion of the hair shaft can occur due to Microsporum audouiini transferred by contact with barber shears, hats or M. canis from pets.

Clinical features
- Diffuse scaling of the scalp with no hair loss
- Circular scaly patches in the scalp with associated alopecia (hair loss)
- In severe cases, a boggy swollen mass with discharging pus and exudates called Kerion is due to animal fungus.

Diagnosis
Remove scales and broken hairs with a blunt scalpel and put it on a slide with Potassium Hydroxide 20%. The hair shaft is seen under the microscope full of fungal spores.

Treatment
Drugs

- Griseofulvin, adults; 500mg orally daily as a single dose or in divided doses (in severe infection dose may be doubled, reducing when the response occurs), children; l0mg/kg body weight daily as a single dose or in divided doses continue till two weeks after the lesions disappear and hair is growing.

Supportive
- Maintenance of good general hygiene
- Avoid sharing of personal items such as towels and clothes
- Keep hair short

11.2.4. Cutaneous Candidiasis

Description
This is an infection of the skin caused by Candida albicans a yeast fungus which is a normal commensal occupying the gut. Under certain circumstances such as diabetes or other endocrine diseases or immunosuppressive states, it becomes pathogenic. The infection usually occurs in the skin folds such as, around the groin area, under the breasts, in the nail folds and axilla. In chronic or severe cases suspect HIV/AIDS.

Clinical features
Moist, white curd-like papules and plaques form which are easily scraped off leaving red and raw-looking patches with clear edges.

Diagnosis
Scrape off white patch and place on a glass slide with a drop of Potassium hydroxide (KOH). Hyphae and yeast are seen.

Treatment
Drugs
- Miconazole cream 2%, topically twice daily.
  Continue treatment for 14 days after lesions have healed.

For nail infections, apply under occlusive dressing.

Supportive
- The patient should be advised to keep the skin dry
- Long-term antibiotic use should be avoided

Patients not responding to topical applications should be referred to a specialist.

11.3. VIRAL SKIN INFECTIONS

These include:

- Chickenpox
- Herpes zoster
- Herpes simplex

11.3.1. Chickenpox

Description

This is a condition caused by the Varicella zoster virus (VZV). It is a common childhood infection. It is characterized by an itchy rash, which appears first on the trunk and spreads out to other parts of the body. Papules and crusts form within a few days. Fever may be present. When the blisters occur they are in crops. The rash lasts 2 to 4 weeks. The condition is usually more severe in the elderly.

Diagnosis

Diagnosis is usually done clinically.

Treatment

Drugs

- Calamine lotion, topically twice daily or
- Chlorpheniramine, adults; 4mg orally twice daily, children up to 10 years; 2mg orally twice daily
- Acyclovir, 800mg orally 5 times daily for 7 days
- Paracetamol, adults; 500mg - 1g orally 3-4 times daily, children; 10-20mg/kg orally 3-4 times daily

11.3.2. Herpes Zoster

Description

This is a condition caused by the resurgence of the Varicella zoster virus. It is characterised by burning pain before the vesicular rash appears. The rash is always unilateral and does not cross the midline (see section 8.8, malignancies).

Treatment

Drugs

- Paracetamol 500mg - 1g orally 3 - 4 times daily.
- Gentian violet may be applied

- Acyclovir 5%, topically 4 hourly for 10 days.
- Acyclovir 800mg orally 5 times daily for 7 days.
- Carbamazepine 200-400mg orally 3 times daily.
  (for post herpetic neuralgia)

Treat secondary bacterial infection with appropriate antibiotics.

Severe neuralgia should be referred to a neurologist.

11.3.3. Herpes Simplex

Description
This is a condition caused by Herpes simplex virus (HSV) type 1 characterised by a vesicular rash around the mouth or genitalia.

Treatment
Drugs
- Usually, no drug therapy is required
- Wash lesions with saline water
- Paracetamol, adults; 500mg-1 g orally 3-4 times daily, children; 10-20mg/kg orally 3-4 times daily
- Acyclovir cream, 4 hourly.

11.4. PARASITIC INFESTATIONS

Description
Parasitic infestations of the body include:
- Pediculosis
- Scabies

11.4.1. Pediculosis (lice)

Description
This is the infestation of the hair or body with lice. Hair infestation (Pediculus humanus var capitis) is characterised by eggs (nits) which appear as small white specks attached to the hair. Body infestation (P. humanus corporis) is characterised by bite marks. Both hair and body infestations cause itching. Eczema may be present. The lice usually live in cloth folds. An infestation of the pubic area called Pediculosis pubis is caused by the crab or pubic louse Pthirus pubis transmitted during close physical contact which may be sexual in nature.

Treatment

Drugs

- Malathion 0.5% lotion. Apply to affected parts. Let it dry naturally and remove by washing after 12 hours.
- Permethrin 1% cream. Apply to clean damp hair.
- Rinse after 10 minutes and dry.

Supportive

- The whole family should be examined and treated if possible
- Bed linen and clothes should be washed in warm water and dried in the sun
- Maintenance of good personal hygiene.

11.4.2. Scabies

Description

This is an infestation of the skin by mites, Sarcoptes scabies, which burrow the skin causing lesions where the female rests and lays eggs. The most common sites are skin folds, wrists, in between fingers and axilla. The main characteristic is intense itching which worsens at night.

Treatment

Drugs

- Benzyl Benzoate 25%, applied all over the body from the neck downwards. Leave to dry and repeat without bathing after 24 hours. Wash off on the third day. A third application may be required. (Not recommended in children, pregnancy and breastfeeding mothers) or
- Permethrin cream 5%, applied all over the body from the neck down to the feet. Wash off after 8 to 24 hours
- For children apply all over the body including the face, neck, scalp and ears
- If hands are washed with soap within 8 hours of application, the cream should be re-applied or
- Malathion 0.5% lotion. Apply all over the body and wash off after 24 hours.

Supportive

- All members of the family should be examined and treated (if possible).
- Clothes and bedding should be washed in warm water and dried in the sun.
- After treatment, only clothes washed as above should be worn.

- Discourage scratching.
- Keep fingernails short and clean.

12. CONDITIONS OF THE EAR, NOSE AND OROPHARYNX

These include:
- Oral diseases
- Pharyngeal diseases
- Nasal diseases
- Ear conditions

12.1. ORAL DISEASES

These include:
- Dental caries
- Periodontal disease
- Oral candidiasis
- Herpes simplex stomatitis
- Mouth ulcers

12.1.1. Dental caries

Description
This is a sugar-dependent disease, which by a combination of chemical and bacterial action, progressively destroys the enamel of the tooth. Many bacteria ferment sugar to produce acid, which in turn causes lesions on the enamel of the tooth.

Clinical features
- Chalky white spots on the chewing surface of the tooth
- Sensitivity of tooth to cold or hot drinks and foods
- Cavity on the tooth
- Pain
- Swelling at the base of the tooth if pulp nerve roots are involved
- Fever

Treatment
Treatment aims to preserve the tooth as far as possible.

Drugs used in infections, complicated extractions or prophylaxis:
- Phenoxymethyl penicillin, adults; 250-750mg orally 6 hourly, children; 1 – 5 years; 125mg orally 6 hourly, 6 – 12 years; 250mg orally 6 hourly

- Paracetamol, adults; 500mg -1g orally 3 times daily, children; 10-20mg/kg orally 3 times daily or
- Aspirin, adults; 600mg orally 3 times daily (Not recommended for children)

Conservation
- Tooth filling
- Root canal treatment if the pulp is affected

Surgical
- Extraction
- Apicectomy

Prevention
- Encourage maintenance of good oral hygiene
- Reduce the intake of sugary foods
- Use of fluoride-containing toothpaste
- Use of mouth rinses containing fluoride
- Use of topical fluoride applications
- Use of sealants in children, where available
- Dental check at least twice a year

12.1.2. Periodontal disease

Description
This is a pathological condition of the periodontium and refers to inflammatory diseases which are plaque-induced.
These fall into two groups:
- Gingivitis
- Periodontitis

12.1.2.1. Gingivitis

Description
This is an inflammatory condition of the free gingivae. It is caused by dental plaque and supragingival calculus or tartar. In this condition, there is no destruction of the supporting tissue.

Clinical features
- Red mucosa
- Loss of gum texture

- Gums bleed easily

Treatment
Scaling and prophylaxis

Drugs
- Metronidazole, adults; 200mg orally 3 times daily for 5 days, children; 7.5mg/kg orally 8 hourly for 5 days
- Phenoxymethylpenicillin, adults; 250-500mg orally 6 hourly for 5 days, children; 12.5 -25mg/kg orally 6 hourly for 5 days or
- Erythromycin, adults; 250-500mg orally 6 hourly for 5 days, children; 2-8 years; 12.5 - 25mg/kg orally 6 hourly, 8-12 years; 25 – 50mg/kg 6 hourly for 5 days

Preventive
- Encourage maintenance of good oral hygiene
- Gargle warm salty water or mouthwash after every ‹ meal
- Brush teeth at least twice daily
- Flossing

12.1.2.2. Periodontitis

Description
This is an inflammatory response of the free gingivae affecting all the periodontal structures. It is caused by plaque and supra or subgingival calculus. It results in the destruction of the attachment apparatus and the development of a periodontal pocket. Halitosis is usually present.

Treatment
- Scaling and prophylaxis
- Subgingival curettage

Drugs
Metronidazole, 200mg orally 3 times daily for 5 days Refer patient to the next level

Prevention
- Encourage maintenance of good oral hygiene
- Use of mouthwash containing fluoride

12.1.3. Oral candidiasis

Description
This is an infection of the mouth caused by Candida albicans. It is commonly known as oral thrush. The infection sometimes also affects the pharynx.

The predisposing factors include trauma, denture wearing, dryness of the mouth, inhaled steroids, radiotherapy, diabetes mellitus, antibiotic therapy, HIV/AIDS.

Clinical features
- Creamy white or yellow plaques on normal mucosa
- Patches on the palatal and buccal mucosa and dorsum ‰ of the tongue and gums.
- Removal of plaques reveals bleeding surface.

Treatment
Drugs
- Gentian violet solution, topically 2 times daily for 7 days or
- Nystatin oral suspension or lozenges, 2 times daily for up to 10 days or
- Miconazole oral gel applied 2 times daily for 10 days or
  Refer to a specialist in case of:
- No improvement
- Painful or difficulty in swallowing or
- Affected pharynx.

Supportive
- Remove or treat the predisposing factor.
- Use snuggly-fitting dentures.
- Good oral hygiene.
- Gargle warm salty water after every meal.

12.1.4. Herpes simplex stomatitis

Description
This is inflammation of the mucosal area due to infection by the herpes simplex virus. It is usually a self-limiting condition clearing up after 7 - 10 days. It is characterised by painful, shallow ulcers around the lip area, gums and tongue. It is common in small children who usually present with high fever and refusal of food because it is too painful to eat.

Treatment

- Debridement
- Mouthwash with tetracycline

Medicines

- Paracetamol, adults; 500-1g orally 3 times daily,
- children; 10-20mg / kg orally 3 times daily for 5 days.
- *Metronidazole, adults; 200-400mg orally 3 times daily, children; 100-200mg orally 3 times daily for 5 days or
- *Phenoxymethylpenicillin, adults; 250-500mg orally 4 times daily, children; 125-250mg orally 4 times daily for 5 days.

**Used in case of secondary infection only.*

Supportive

- Increase fluid intake
- In severe cases, a nasogastric tube may be necessary until
- the child can feed again.
- Saline mouthwash and gargle
- Avoid acidic foods and drinks
- Refer to a specialist if the condition is severe or does not heal within 7-10 days.

12.1.5. Mouth Ulcers

Description

This is a condition in which there is damage to the mucosal lining of the mouth, including the tongue. These are similar to ulcers due to the herpes simplex virus. They are painful and may occur singly or in groups. They frequently recur and can be very troublesome.

Treatment

- Paracetamol, adults; 500-1g orally 3 times daily, ^^ children; 10-20mg/kg orally 3 times daily
- Aspirin, 600mg orally 3 times daily for adults only
- Chlorhexidine gluconate, 10-15ml as a mouthwash kept in the mouth for about 30 seconds to 1 minute 2-3 times daily Ulcers that do not heal rapidly should be referred to a specialist.

12.2. PHARYNGEAL DISEASES

These are conditions affecting the pharynx. They include:

- Tonsillitis and pharyngitis
- Peri-tonsillar abscess
- Epiglottitis

12.2.1. Tonsillitis and Pharyngitis

Description

This is an inflammation of the pharynx and tonsils. There are two types of pharyngitis; viral and bacterial. The vast majority of pharyngitis is viral, which is self-limiting. In clinical practice, it is difficult to distinguish between viral and bacterial pharyngitis. It is important to diagnose and treat streptococcal throat infections to prevent Rheumatic fever and other complications.

Acute tonsillitis is most frequent in childhood. However, it is very rare in adults. Untreated acute tonsillitis will subside over the course of one week. Appropriate treatment will make the illness shorter.

Diphtheria infection is an important differential diagnosis.

Clinical features

Symptoms

- Sore throat
- Pain on swallowing
- Headache
- Fever
- Voice change

Signs of streptococcal pharyngitis

- High fever
- White pharyngeal exudates
- Tender enlarged anterior cervical lymph nodes
- Grossly enlarged painful tonsils which are asymmetrical
- Absence of signs suggesting viral pharyngitis.

Signs of viral pharyngitis

- Nasal stuffiness
- Coryza

- Irritating cough
- Conjunctivitis

Signs of tonsillitis:
- Hyperaemic tonsils
- Enlarged tonsils
- Pus in the crypts

Treatment
Viral pharyngitis
- No antibiotics should be given
- Analgesia for pain and fever relief

Streptococcal pharyngitis and tonsillitis
Drugs
- Phenoxymethylpenicillin, adults; 250-500mg orally 6 hourly at least 30 minutes before food, children, up to 1 year; 62.5mg orally 6 hourly, 1-5 years; 125mg orally 6 hourly, 6-12 years; 250mg orally 6 hourly for 7 days or
- Erythromycin, adults; 250mg-500mg orally 6 hourly, children, up to 2 years; 125mg orally 6 hourly, 2-8 years; 250mg orally 6 hourly for 7 days
- Paracetamol, adults; 500mg-1g orally 3-4 times daily, children; 10-20mg/kg orally 3-4 times daily Complications of streptococcal pharyngitis
- Peritonsillar and parapharyngeal abscesses
- Rheumatic fever

Refer for specialist treatment

12.2.2. Peri-tonsillar abscess

Description
This is an abscess around the tonsils

Clinical features
It presents with signs of acute tonsillitis but with more pain on one side and almost always a large, very tender lymph node on that side. The patient may be unable to swallow fluids. It is always difficult to see into the mouth because the mouth cannot be opened widely. Use a good light and gently depress the tongue on the painful side to look for bulging of the tonsil and the palate above the tonsil.

Treatment

Drugs

- Pethidine (if needed) , adults; 50-100mg intramuscularly repeated 4 hourly, children; 0.5-1mg/kg intramuscularly repeated 4 hourly
- Dextrose solution or Normal Saline intravenously
- Benzyl Penicillin, adults; 1 MU intravenously 6 hourly, children; 50,000-100,000 IU kg/day intravenously in 4 divided doses for 5 days or
- Phenoxymethyl penicillin, adults; 500-750 mg orally 6 hourly, children; 20-50 mg/kg orally daily in 4 divided doses for 5 days
- Metronidazole, adults; 500mg intravenously or 400mg orally 8 hourly for 5 days, children; 20-30 mg/kg orally or 7.5 mg/kg intravenously in divided doses 8 hourly

Surgical

- Incision and drainage, if necessary Patients should be nursed in a place where surgery can be done urgently.

12.2.3. Epiglottitis

Description
This is an acute inflammation of the epiglottis due to *Haemophilus influenzae* type B. The condition can be life-threatening.

Clinical features
- Acute onset, usually within 6 hours
- High fever
- Toxic patient
- Drooling of saliva
- Respiratory stridor

Diagnosis
Diagnosis should be suspected from clinical features. Avoid throat examination as the patient's airway may become completely obstructed.

Treatment
Refer immediately for specialised treatment.

Drugs
- Chloramphenicol, adults; 500mg-1g intravenously 4 times daily, children; 50-100mg/kg daily in 4 divided doses for 5 days.
- Cefotaxime, adults; 1g intramuscularly/ intravenously 12 hourly, increased in severe infection to 8 - 12 g in 3-4 divided doses, children; 100-150mg/kg daily in 2-4 divided doses increased up to 200mg/kg daily in very severe infections.

12.3. NASAL DISEASES

These include:
- Acute sinusitis
- Allergic rhinitis

12.3.1. Acute sinusitis

Description
This is an inflammation of one or more sinuses. This condition usually occurs after suffering from a common cold or allergic rhinitis.

Clinical features
- Tenderness over the affected sinuses

- Headache
- Blocked nose
- Copious mucopurulent discharge
- Fever

Treatment
Medicines
- Paracetamol, adults; 500mg-1g orally 3-4 times daily, children; 10-20mg/kg orally 3-4 times daily
- Amoxicillin, adults; 250 - 500mg orally 3 times daily, children over 20kg; 250mg orally 3 times daily, 10- 20 kg; 125mg orally 3 times daily, below 10kg;

62.5mg orally 3 times daily for 5 days or
- Cotrimoxazole, adults and children over 12 years old; 960mg orally 2 times daily, children 5 - 12 years; 480mg orally 2 times daily, 6 months to 5 years;

240mg orally 2 times daily

Supportive
- Steam inhalation
- Saline nasal drops

Complications
- Dental abscess
- Periorbital swelling

Patients with complications need referral to a specialist.

12.3.2. Allergic rhinitis

Description
This is inflammation of the nasal mucosa due to hypersensitivity to allergens. The common allergens include pollen, dust, animals, or food.

Clinical features
- Recurrent nasal blockage
- Irritation
- Watery nasal discharge
- Sneezing
- Watery and itchy eyes

Treatment
Drugs
- Chlorpheniramine, adults and children over 12 years; 4mg orally 2 times daily, children 5 - 12 years old; 2mg orally 2 times daily, 6 months to 1 year 1mg orally 2 times daily
- Loratidine, adults; 10mg orally once daily, children 2-5 years; 2-5mg orally once daily

Supportive
- Saline nasal drops used at night. But these should not be used for too long periods, as rebound blockage is likely to occur
- Avoid causative allergens

Persistent attacks with severe symptoms should be referred to the specialist.

12.4. EAR CONDITIONS

These include:
- Acute otitis media
- Chronic suppurative otitis media

12.4.1. Acute otitis media

Description
This is inflammation of the middle ear. It usually follows an upper respiratory tract infection.

Clinical features
- Fever
- Severe pain in the ear, worse at night
- Babies cry, rub or pull the ear
- Red bulging eardrum
- Blood and/or pus discharge

Treatment
Drugs
- Amoxicillin, adults; 250-500mg orally 8 hourly, children; 12.5-25mg/kg orally 8 hourly for 5 days
- Aspirin (adults only); 600mg orally 3 times daily
- Paracetamol, adults; 500mg-1g orally 3-4 times daily, children; 10-20mg/kg orally 3-4 times daily

- Phenoxymethyl penicillin, adults; 250-500mg orally 6 hourly, children up to 1 year; 62.5 orally 6 hourly, 1-5 years; 125mg orally 6 hourly, 6-12 years; 250mg every 6 hours for 7-10 days or
- Erythromycin, adults; 250-500mg orally 4 times daily, children; 125-250mg orally 4 times daily for 5 days

Supportive
- Avoid wetting the inside of the ear

Complications
- Mastoiditis
- Hearing loss
- Acquired cholesteatoma

12.4.2. Chronic suppurative otitis media

This is a condition in which there is an ear discharge lasting more than two weeks and results from inadequately treating or neglecting acute otitis media.

Clinical features
- Painless discharge from one or both ears
- Perforation of the eardrum
- Discharge may be thin, clear, mucoid to thick, pasty,
- offensive mucopus
- Presence of multiple organism infection
- Red and swollen middle ear mucosa
- Mucosa may bulge if blocked

Treatment
- Wick dry with a cotton cloth
- Keep the ear as dry as possible
- Antibiotics are not usually indicated
- The patient should be referred when:

1. Pain is present
2. There is swelling behind the ear
3. There is poor response to treatment.

13. SURGICAL CONDITIONS

This chapter discusses the following conditions:

- Injuries
- Animal bites
- Testicular torsion
- Strangulated hernia
- Hydrocele
- Varicocele

13.1. INJURIES

Description

Injuries refer to harm that occurs to the body. They may be intentional or due to accidents. The cause may be physical, chemical, burns, or traffic accidents.

Injuries may cause temporary or permanent disability. Injuries may be divided into minor and major injuries.

13.1.1. Minor injuries

These include cuts and blunt injuries. Cuts are usually from sharp objects, especially household implements. Blunt injuries usually follow assault.

Clinical features

Cuts may bleed and if seen late may have developed an infection with pus formation.

Blunt injuries will cause bruises or haematomas or more serious deeper injuries, such as bone fractures.

Treatment

- Clean open wounds thoroughly with soap and water or a disinfectant
- Remove foreign matter and dead tissue
- Suture fresh superficial wounds
- Do not suture open wounds after 6 hours of injury
- Cover the wound with a dressing

Drugs

- Tetanus toxoid, 0.5ml intramuscularly as a single dose
- Anti-tetanus serum, 250 IU as a single dose (for non-immunised patients)

- Paracetamol, adults; 500mg-1g orally 3 times daily, children; 10-20mg/kg orally 3 times daily or
- Aspirin, (adults only) 600 mg orally 3 times daily Haematomas usually resolve on their own.

13.1.2. Major injuries

These are multiple injuries or serious injuries to specific body parts.

13.1.2.1 Multiple injuries

These may be characterised by fractures, bruises, internal injuries, head injuries, spinal injuries, and chest trauma or eye injuries. The patient will present with two or more of such injuries. They may result from traffic accidents, assault or war.

Treatment
Initially, a quick history and examination should be carried out to establish the severity of the injuries.
- Establish a clear airway
- Remove any debris in the mouth
- Insert airway breathing, if necessary
- Ensure good circulation

Set up an intravenous line with the largest gauge possible
- Control bleeding
- Resuscitate, if necessary
- Treat shock
- Look for signs of internal haemorrhage
- Group and cross match blood
- Clean and debride wounds before suturing
- Immobilize fractures immediately

Drugs
- Tetanus toxoid, 0.5ml intramuscularly as a single dose

Refer the patient to the nearest hospital in case of head or chest injuries, suspected internal haemorrhage, loss of consciousness or need of additional care.

13.1.3. Specific injuries

13.1.3.1. Head injuries

The patient may present with a laceration, fracture, a history of altered consciousness or amnesia

General Management

- An accurate history is needed, especially to find out if the patient was unconscious at any time after the head injury. A careful examination is needed. Head injuries may be associated with a fracture or dislocation of the cervical spine
- Brainstem compression causes hypertension and bradycardia, with irregular respiration
- Assess the conscious level using the Glasgow Coma Scale (GCS). The face and head should be examined carefully for blood or cerebrospinal fluid draining from the nose or ears, suggesting a fractured base of the skull

Examination of the eyes is needed as a unilateral
fixed and dilated pupil may indicate a haematoma on the same side

Investigations

- X-ray of the cervical spine (lateral view)
- X-ray of the skull (anteroposterior, lateral and Townes' views)

Specific treatment

The patient should be admitted to hospital for observation for at least 24 hours, even if it is a trivial injury, if there is:

- History of loss of consciousness
- Loss of consciousness on arrival in hospital
- Focal neurological signs
- Post-traumatic amnesia
- Significant drowsiness
- Severe headache or vomiting
- Blurred vision
- Other associated injuries
- Skull fracture

Management

- Do hourly observation of GCS, breathing pattern, vital signs, and pupil reaction

- The airway must be safe and patients nursed with the head propped up at 150
- Severe injuries need specialised management by a neurological centre
- Restrict intravenous fluids to minimise cerebral oedema. Sufficient fluid to maintain a urine output of 0.5 – 1ml/kg/hour should be given

1.1.3.2. Facial injuries

Treatment
- Maintain the airway as swelling may be severe
- Intubation or tracheostomy may be performed, if necessary
- Prophylactic antibiotics should be given for facial fractures

13.1.3.3. Spinal injuries

This should always be suspected in patients with head injury or multiple trauma(s). There may be numbness, paresthesia, weakness of the limbs or pain radiating down a limb.

Diagnosis
Lateral view X-ray of the cervical spine, including all cervical vertebrae and first thoracic vertebra.

Treatment
- The patient should be moved very carefully
- Avoid rotation and extremes of flexion and extension
- The attendants should work as a team to move the patient. One assumes responsibility for the neck and places the fingers under the angle of the mandible with palms over the ears and parietal region and maintaining gentle traction. Keep the neck straight and in line with the body. The neck can be splinted with a sandbag on either side or a cervical collar

Refer for specialised management, which will be needed for specific injuries.

13.1.3.4. Eye injuries

For penetrating or blunt trauma refer the patient for specialised treatment at a higher level of care. (See also chapter 9)

13.1.3.5. Chest injuries

Clinical features

- Pain on breathing
- Dyspnea
- Unequal movement of the chest wall
- Surgical emphysema of neck and chest
- Palpable rib fractures
- Bruising
- Tracheal deviation
- Restlessness
- Central cyanosis
- Tachycardia
- Hypotension
- Sweating

Diagnosis

- Bruising over the lower left ribs may indicate a ruptured spleen
- Bruising over the right lower ribs may indicate a ruptured liver
- Chest X-ray (anteroposterior view)

Treatment

- Rib fractures do not require any specific management apart from analgesia
- A large flail chest may require mechanical ventilation for 10-14 days and stronger analgesia

Pneumothorax

There are two types: open and tension.

Open

- Conservative management
- Refer for appropriate treatment if patient's condition deteriorates Tension
- This is an emergency
- Convert to open pneumothorax by pushing a large-bore needle into the 2nd intercostal space along the midclavicular line
- Insert an intercostal underwater seal drainage

Haemothorax

There are two types: asymptomatic and symptomatic.

Asymptomatic

- Conservative management Refer for appropriate treatment if patient's condition deteriorates

Symptomatic

- Insert an intercostal underwater seal drainage
- The patient should be referred to a higher level or specialist care

Flail chest

- The patient needs oxygen or mechanical ventilation
- Ribs may need to be fixed.
- Refer to a higher level or specialist care

13.1.3.6. Abdominal injuries

Penetrating injuries are usually due to stab and bullet wounds. The patient may present with a metal protrusion or disembowelment. The injuries may result in haemoperitoneum. Haemoperitoneum may be present with pain, abdominal distension, rigidity or tenderness.

Diagnosis
Peritoneal aspiration for haemoperitoneum should be done
Treatment
All abdominal bullet or stab wounds should be explored by laparotomy

13.1.3.7. Renal injuries

There is usually microscopic or macroscopic hematuria.

Diagnosis

- Abdominal ultrasound
- Intravenous urogram

Clinical features

- Swelling in the loin area
- Bruising in the loin area
- Tenderness in the loin area

Treatment

- Catheterise patient

Refer the patient to a specialist for specific treatment

13.1.3.8. Burns

Description:
A burn is an injury occurring after exposure of the body surface to friction, chemicals, electricity or extreme temperature.

Clinical Features:
Burns may result in damage to the dermis. Such damage may be partial or full-thickness.

Partial-thickness burns
- Some of the dermis is alive
- Heals in 10-14 days without scarring
- Blisters may be present
- Pain
- Shock may be present

Full-thickness burns
- Damage to all of the dermis
- Usually, heal after 21 days with scarring
- Painless
- Shock may be present

Complications
- Infection
- Anaemia
- Contractures
- Pulmonary oedema may occur after inhalation of smoke
- Acute peptic ulcers
- Acute renal failure

Management
Assessment
- Examine for shock and loss of fluids
- Assess the extent and depth of the burn
- Look for signs of infection

Treatment
Drugs
- Paracetamol, adults; 500mg-1g orally 3 times daily, children; 10-20mg/kg orally 3 times daily or

- Pethidine, 0.5-1mg/kg intramuscularly 4-6 hourly for severe burns
- Tetanus toxoid 0.5ml intramuscularly as a single dose, if necessary
- Topical antibacterial agents – silver nitrate, and silver sulphadiazine cream. Others used are Povidone-iodine, Chlorhexidine.

Supportive

- High calorie, high proteins diet
- Physiotherapy for burns affecting joints as soon as the patient is resuscitated and pain has been controlled Specific Care
- Superficial burns should be cleaned with water, dried and left open
- Fluid replacement. Suggested fluids are normal saline, ringer's lactate or Hartmann's solution. 50ml of 50% dextrose per litre can be added
- Do not open blisters
- Dress burns with Vaseline gauze but exposure method is preferred
- Wash burns every 4-6 hours with saltwater
- Use showers. Avoid baths which may allow cross infection
- Slough is removed using wet to dry dressings
- Dressings should not be allowed to dry and stick
- Specific areas such as the eyes, eyelids, ears, perineum and hands need specific care
- The haemoglobin should be checked once a week and transfusion given, if necessary
- Monitor urine output. It should be at least 1ml/kg/hour

All patients with deep and extensive burns should be referred to a specialist.

Determination of burn size

The burn size in adults is determined using the rule of nines in which the following body areas are taken to represent 9% or 18%:

Whole of each upper limb	*= 9%*
Whole of each lower limb	*= 18%*
Front of trunk	*=18%*
Back of trunk	*=18%*
Whole of head and neck	*=9%*
Perineum	*=1%*

The above formula is not applicable to children. In children, the burn size can be determined by considering the area of one palm surface of the patient's hand as 1% of body surface area. This palm surface formula is also applicable to adults.

Fluid therapy in burns

Fluid requirements

a) Maintenance requirements are indicated in table below:

Age group	**Weight (kg)**	**ml/kg/ 24hours**	***ml/kg /hour***
Neonates (<3months)	3	150	*6*
Infants (>3months)	3-10	10-20	*5*
	120	80	*3*
Children	>20	60	*2.5*
Adults		**35**	***1.5***

b)Extra requirements

Age under 6
One ration = 2 x burn size x weight

Age 6 or over
One ration = 1 x burn size x weight

Note:
On top of the maintenance fluid requirement which is given at a constant rate, one ration of extra fluid is given during the first 8 hours from the time of the burn, a second ration during the next 8 hours and a third ration during the next 24 hours.

Prevention of injuries

- Public education on the supervision of young children
- Household chemicals, insecticides, sharp objects should be kept out of reach of children.
- Teach road safety measures at an early age
- Safety standards in places of work should be maintained

13.2. BITES

Description
These are bites which are inflicted by animals or humans.

Clinical features

A wound may sometimes be associated with fractures or amputations if inflicted by large animals. There may be bleeding.

Complications
Infection with both aerobic and anaerobic bacteria or viruses.

Treatment
- Clean, debride the wound
- Excise dead tissue
- Leave the wound open for delayed primary or secondary suture

Drugs
- Phenoxymethylpenicillin, adults; 250 -500mg orally 4 times daily, children; 125-250mg orally 4 times daily for 5 days
- Metronidazole, adults; 200-400mg orally 3 times daily, children; 100mg - 200mg orally 3 times daily for 5 days
- Tetanus toxoid, 0.5ml intramuscularly as a single dose.

If the bite is from a suspected rabid animal, administer post-exposure rabies treatment. (Refer to Chapter 2.7).

13.3. TESTICULAR TORSION

Description
This is the twisting of the testis along its vertical axis, resulting in compromised blood supply to the testis and the adjoining spermatic cord. It may be spontaneous or following strenuous activity. It may also result from anomalies in the development of the tunica vaginalis and the spermatic cord.

Clinical Features
Symptoms
- Severe local pain
- Nausea
- Vomiting
- Scrotal swelling
- Dark discolouration of the scrotum
- Fever

Diagnosis

This is clinical and confirmed on surgical exploration

Treatment

- Immediate surgical intervention is advised if the torsion is suspected. Surgical exploration of the scrotum within a few hours offers the only hope of testicular salvage.
- Fixation of the contralateral testis is performed to prevent torsion on that side.
- Appropriate antibiotic cover is required.

13.4. STRANGULATED HERNIA

Description

This is a condition in which the blood flow to an abnormally protruding viscus is compromised. The strangulation can occur in any type of hernia.

Clinical Features

- Abdominal pain
- Fever
- Vomiting
- Irritability
- Restlessness
- Abdominal distension
- Guarding of the abdomen
- Rebound tenderness

Hernia must be differentiated from hydrocele, in the former, the examiner cannot palpate the cord above the mass, whereas with hydrocele normal cord structures are usually palpable above the mass. In strangulated hernia, there is a previous history of a swelling. A hydrocele is often cystic and can be trans-illuminated using a torch.

Diagnosis

- History and examination is very important in making a diagnosis
- Abdominal X-rays

Treatment

The basic line of management is immediate surgical intervention and relieving the obstruction. It is mandatory to inspect the bowel if gangrenous resection is done and anastomose the viable segments.

Drugs

- Benzylpenicillin, adults; 2 MU intravenously 4 times daily, children; 50,000-100,000 IU/kg intravenously in 4 divided doses for 5 days
- Metronidazole, adults; 500mg intravenously 3 times daily, children; 7. 5mg/kg 8 hourly for 5 days
- Gentamicin, adults; 80mg intravenously 3 times daily, children; 2-3mg/kg intravenously in three divided doses for 5 days
- Intravenous fluids

13.5 HYDROCELE

Description

This is a condition characterised by the accumulation of fluid in the tunica vaginalis and it presents as a cystic scrotal mass.

Clinical Features

- Intrinsic, often cystic and painless scrotal mass
- May be painful when severely distended
- Mass is unilateral
- Transluminal mass
- Spermatic cord is palpable above the cystic mass

Treatment

- Hydrocelectomy
- Appropriate antibiotic cover is required

13.6. VARICOCELE

Description

This is a collection of large veins, usually occurring in the left scrotum. It feels like a “bag of worms”. It is present when the patient is in the upright position and should empty in the supine position.

Clinical Features

- Pain
- Feeling of scrotal fullness

Treatment

- Varicocelectomy
- Appropriate antibiotics cover is required

13.7. TESTICULAR TUMOURS

Description

These are malignant growths arising from the testis. Testicular tumours account for the majority of solid malignancies in males older than 30 years of age.

Pathology

Most malignant testicular tumours arise from the primordial germ cell and are classified as seminoma teratoma, embryonal carcinoma, teratocarcinoma and choriocarcinoma in order of increasing malignancy.

Clinical Features

The usual presenting sign is a scrotal mass, increasingly progressive in size and sometimes associated with pain. Many patients relate the mass to minor trauma indicating the time when the mass, was first discovered. Haemorrhage into a rapidly expanding tumour may produce exquisite local pain and tenderness. A firm mass arising from the testis is cause for immediate clinical suspicion of testicular tumour.

Diagnosis

- Physical examination
- Ultrasound may localise the lesion to the testis.
- Exploration, exposing and clamping the cord through an inguinal incision before mobilizing the tumour.
- Chest x-ray and IVU is done to rule out metastasis.
- Prognosis depends on the histological finding and the extent of the tumour.

Treatment

Inguinal orchidectomy must be performed and transabdominal retroperitoneal lymph node dissection is usually recommended for terato and embryonal carcinoma and adult teratoma.

Irradiation may be effective in seminoma, using 30 to 50ay (3000 to 5000 rads) to abdominal and mediastinal lymphatics as well as left supraclavicular areas, depending on the staging.

13.8. ACUTE MUMPS ORCHITIS

Description

This is an inflammatory condition of the testis caused by the mumps virus. It is a paramyxovirus. About 20 % of post-pubertal male patients have testicular inflammation, usually unilateral.

Clinical Features

There is testicular swelling associated with inflammation in other organs - parotid gland, pancreas, meninges, etc. Testicular atrophy may ensue.

Treatment

This is symptomatic - analgesics may be used for pain and generalised malaise.

14. POISONING

Description
This is the exposure by ingestion, inhalation or other means of a substance capable of causing harm to the body.

Clinical features
The patient may present a variety of symptoms ranging from mild to serious ones like the loss of consciousness.

Diagnosis
- Assess for vital signs
- Ascertain as far as possible, the nature and quantity of the poison and when it was taken.

14.1. MANAGEMENT OF A POISONED PATIENT

Management depends on the type of poison taken and the clinical condition of the patient. Treatment is aimed at slowing down, reducing or preventing further absorption of the poison and to counteract the effects of the poison already absorbed.

All patients with poisoning should be referred to a specialist after emergency treatment.

Emergency resuscitation measures should be taken in the following circumstances:
a)Obstructed airway
- Pull the tongue forward
- Remove dentures, foreign bodies (e.g. food) and oral secretions
- Hold the jaw forward and insert an oropharyngeal airway if possible
- Put the patient in a semi-prone position with head down to minimise the risk of inhaling vomit.

b) Inadequate respiration
- Give continuous oxygen
- Apply assisted ventilation with an Ambu bag or mouth to mouth or intubate and do mouth to tube respiration.
- Do not use respiratory stimulants as they cause harm.

c) Hypotension

- Keep patient in a position with his head downwards by elevating the foot of the bed
- Administer 0.9% sodium chloride intravenously.

d) Recurrent fits

Control with diazepam, adults; 5-10mg intravenously stat, children; 0.2-0.3mg/kg intravenously stat.

Repeat as necessary.

e) Removal of poison from the stomach

Gastric emptying carries the risk of the victim inhaling gastric contents. The benefit of the procedure should therefore be weighed against this risk. The procedure should not be performed in the following circumstances:

- When corrosive substances (e.g. acids, alkalis and petroleum products) have been swallowed.
- When there is marked hypothermia (less than 30 ^{0}C)
- When the amount of poison swallowed is minimal
- If the poison was ingested more than 2 hours earlier (except in the case of poisoning with salicylates, tricyclic anti-depressants and beta-blockers)

Procedure

To remove the poison from the stomach, two methods may be used:

- Inducing vomiting by giving:

–Ipecacuanha syrup, adults; 30ml, children above 1 year; 15ml, children below 1 year;

10ml followed by a glass of water. Repeat after 20 minutes if necessary.

- Gastric lavage

If done in an unconscious patient, a cuffed endotracheal tube should be passed to prevent aspiration of stomach contents into the lungs. Reduction of absorption of the poison

After vomiting has occurred:

- Activated charcoal; 50g mixed with 400ml water in a bottle and shaken well. Administer the suspension in a dose of 5ml/kg. Repeat every 4 hours. Total dose of 100g for adults, if necessary
- Magnesium sulphate mixture or magnesium hydroxide mixture; 50ml to avoid constipation
- Milk, cooking oil or beaten raw egg may also be given in the absence of activated charcoal, to delay the absorption of the poison

14.2. TREATMENT OF SPECIFIC COMMON POISONING

14.2.1. Aspirin and other Salicylates

Treatment

- Induce emesis with ipecacuanha, unless respiration is depressed
- Give activated charcoal
- If respiration is depressed, do airway-protected gastric lavage
- Gastric emptying is effective up to 4 hours after ingestion of poison

14.2.2. Carbon monoxide

Treatment

- Remove the patient from further exposure
- Give oxygen for several hours
- Maintain blood pressure and normal body temperature
- To reduce cerebral oedema, give 20% mannitol, intravenously 5ml/kg body weight over 20 minutes and a corticosteroid intravenously or intramuscularly 4 hourly (e.g. prednisolone, 1mg/kg body weight dexamethasone, 0.15mg/kg body weight or hydrocortisone, 4mg/kg body weight)
- Control convulsions or hyperactivity with diazepam, 0.1mg/kg body weight by slow intravenous or per rectum

14.2.3. Ethanol

Treatment

- Remove unabsorbed ethanol by gastric lavage or inducing emesis with ipecacuanha syrup
- Give activated charcoal
- Maintain adequate airway
- Maintain normal body temperature
- If the patient is hypoglycemic give dextrose 50%, followed by 5% intravenously
- May need Vitamin B compound, if chronic alcohol abuser

14.2.4. Insecticides

14.2.4.1. Organochlorine

Treatment

- Remove the patient from the source of poisoning and remove contaminated clothing
- Give ipecacuanha syrup
- After vomiting give activated charcoal followed by gastric lavage with 2 – 4 litres water (adult dose)
- Give a laxative such as magnesium hydroxide
- Do not give milk, fats or oils as they will increase absorption of the poison
- Scrub the skin with soap and cold water to remove skin contamination
- Give artificial respiration with oxygen if there is respiratory depression
- Give diazepam, 10mg slow intravenous or phenobarbitone, 100mg intramuscularly to control convulsions, hyperactivity or tremors

14.2.4.2. Organophosphates and Carbamates

Treatment
- Remove the patient from the source of poisoning and remove contaminated clothing
- Establish airway and give artificial respiration if necessary
- Remove excess bronchial secretions by suction
- Give ipecacuanha syrup or start gastric lavage
- Give atropine, adults; 2mg intravenously/ intramuscularly stat, children; 100-200mcg intravenously/intramuscularly/orally every 3 – 8 minutes until signs of atropinisation appear (hot dry skin, dry mouth, widely dilated pupils and fast pulse)

14.2.5. Paraffin, petrol and other petroleum products

Treatment
- Prevent the substance from entering the lungs to avoid damage to tissue
- Do not induce vomiting
- Do not do gastric lavage
- Look out for pulmonary oedema and chemical pneumonitis and treat accordingly.

14.2.6. Paracetamol poisoning

Clinical features
Liver damage may result in paracetamol overdosage. The damage occurs within a few hours of ingestion.

Treatment

- Keep the patient quiet and warm
- Induce emesis with ipecacuanha syrup
- Where there is depressed respiration use airway- protected gastric lavage
- N-acetylcysteine 20% solution, orally 140mg/kg as a loading dose, followed by 70mg/kg every 4 hours for 3 days. It may be necessary to administer through a nasogastric tube
- Dextrose 5% intravenously for the first 48 hours
- Phytomenadione 1– 10mg intramuscularly if the prothrombin time ratio exceeds 2.0
- Do not force diuresis.

14.2.7. Chloroquine poisoning

Clinical features
Characterised by blurred vision, tinnitus, weakness, hemoglobinuria, oliguria, low blood pressure, shock, convulsions, cardiac arrest

Treatment

- Induce emesis
- Stomach wash (air-way protected gastric lavage, if respiration is depressed)
- Give activated charcoal
- Treat symptomatically

14.2.8. Mushroom or other food poisoning

Clinical Features
There will be abdominal pain, nausea, vomiting, and diarrhoea.
Shock, in severe cases

Treatment
Symptomatic:

- Bed rest
- Keep patient warm
- Stomach wash using normal saline
- Give Oral Rehydration Salts (ORS) or intravenous fluids to re-hydrate
- If no improvement, refer to a specialist.

14.2.9. Snake Bites

Treat all snakebites as an emergency.

Clinical features

- Pain
- Swelling
- Tissue necrosis
- Regional lymph node swelling
- Haemorrhagic symptoms; bleeding at wounds site
- And other parts of the body

Danger signs

- Drowsiness
- Slurred speech
- Excessive oral secretions
- Difficulty in breathing
- Neurological signs

Treatment

- Immobilise limb and keep slightly elevated
- Administer tetanus toxoid
- Dextrose 5% in saline intravenously
- Treat shock
- Vitamin K, 1-10mg intramuscularly
- Anti-snake venom, if available
- Transfer the patient to a specialist

Prevention

- Wear protective shoes
- Clear bushes near dwelling places
- Avoid walking on dark paths.

15. DISORDERS OF THE RENAL SYSTEM

15.1. METABOLIC DISORDERS

15.1.1. Hyperkalemia

Description
This is serum Potassium > 5.5mmol/L.

Clinical features
Symptoms
Muscle weakness

Signs
- Ascending paralysis with respiratory failure
- Cardiac instability, ventricular fibrillation, cardiac arrest
- May have signs of acute kidney injury or metabolic acidosis

Investigations
- Serum Potassium
- ECG – tall, peaked symmetrical T wave, flat P, increased PR interval, wide QRS, bradycardia, AV block

Therapy
- Stop the source of Potassium (oranges, bananas, ACEI, K+ sparing diuretics, cotrimoxazole, heparin, NSAIDs, B-blockers)

1. Severe Hyperkalemia (K > 6.5) and ECG changes

a) Protect the heart- 10mls 10% Calcium Gluconate over 10mins.

b) Push potassium into the cell with insulin, salbutamol (albuterol) and sodium bicarbonate, either singly or in combination with;

i. 150mmols of 8.4% NaHCO3 in 1 litre 5% Dextrose over 3 to 4 hours if the patient is also acidotic. Another dose can be given to bring the serum bicarbonate level to 24 mmol/L.

(DONT USE or INFUSE WITH Ringer's Lactate but USE 5% Dextrose for infusion).

ii. 100mls 50% Dextrose with 10 IU soluble insulin over 15-20mins. May give 2-4 hourly as required. Monitor serum glucose 2-4 hourly.

iii. 10-20mg nebulised salbutamol

c. Remove potassium from the body with the following;

i. Frusemide 1mg/kg IV (Please hydrate patient first if dehydrated)
ii. Kayexalate/Sodium Resonium 15-30g in 50- 100mls 20% Sorbitol or with lactulose PO/PR
iii. Consider Hemodialysis if refractory

2. Moderate Hyperkalemia (Potassium 6.0 – 6.5 mmol/L)

a. Push Potassium (K+) into the cell
b. Push Potassium (K+) out of the body

3. Mild Hyperkalemia (Potassium 5.5 – 5.9 mmol/L) Push Potassium (K+) out of the body

15.1.2. Hypokalemia

Description

Serum Potassium (K^+) < 3.5, may be associated with hypomagnesaemia and hypocalcaemia.

Clinical features

Symptoms

Muscle weakness, fatigue, constipation, muscle cramps.

Signs

Paralytic ileus, ascending paralysis, reduced reflexes.

Tetany when associated with alkalosis

- Arrhythmias

Causes

- GIT and Renal losses

Management

Investigations

- Check K+, other electrolytes and serum pH
- ECG- flat or inverted T wave, prominent U wave.

Therapy

- 20mmol KCL in 250-500mls Normal saline over one hour. Check K+ before repeating dose and ECG monitoring.
- Consider 6-12mls (5-10mml/l) 20% magnesium sulphate or 2mls 50% magnesium sulphate diluted in 50mls 5% Dextrose over one hour.

• If cardiac arrhythmia or arrest give 2mmol KCl per minute iv for 5mins. Repeat ONCE only if necessary
• Oral K+ supplements if K+>3.0

15.1.3. Hypernatremia

Description serum Na^+ less than 150mmol/ L

Clinical features
Symptoms
• thirsty, nausea, vomiting, weakness, malaise
• muscle tremor, weakness

Signs
Drowsiness, stupor, coma, convulsions, tremors, ataxia

Causes
• water loss more than electrolyte
–GIT losses,
–Renal losses (osmotic diuresis, DI)
• increase in Na+
–Hyperaldosteronism, Cushing's
–Excessive saline or sodium bicarbonate infusion

Management
• Investigate and treat the cause
• Please do urine Na+ as well

Therapy
• Correct water deficit – rehydrate first if the patient is dehydrated
• Stable/asymptomatic patients
–take it easy
–replace fluids orally
• unstable/symptomatic patients
–IV fluids with NS, DNS, avoid 5%Dextrose as Na+ may drop too fast
–rate of lowering serum Na+ 0.5-1mmol/hr, aim for 12mmol/l in 24hrs and not more than this
–ESTIMATE THE EFFECT OF 1 LITRE OF ANY INFUSATE ON SERUM Na+
–Change in serum Na+ = (infusate Na+ - Serum Na+) divided by (total body water + 1)

–The answer is in mmol/L. The formula helps to calculate the infusion rate so that you do not exceed 1 mmol/min.

15.1.4. Hyponatremia

Description
Low serum Na but treatment warranted with severe
(<120mmol/l) or acute.

Clinical features
- asymptomatic unless severe or acute
- nausea, vomiting, seizures, coma

Causes
- hypovolemic
- GI losses, renal losses

Euvolemic
- SIADH
- Hypothyroidism
- Adrenal insufficiency

Hypovolemic
- CCF
- cirrhosis
- Nephrotic syndrome

Management
- Investigate and treat the cause.
- Urine Na+ should be ordered, urine and serum osmolarity should be measured.

Therapy
- CNS manifestations

–200mls 5% NaCl over 6 hours. Monitor serum Na+ hourly
–Aim to increase Na+ to 120mmol/l at a rate of
0.5 – 1.0mmol/l per hour
–If no CNS symptoms, do not use Hypertonic saline.
–Once serum sodium is around 120mmol/l, stop active therapy and restrict fluid intake to approx.
500mls/day.

• Asymptomatic
–Use of conservative measures such as fluid restriction may be enough.
• SIADH
–restrict fluid intake to 50-60% of estimated maintenance fluid requirements(±1L/day).

15.1.5. Hypercalcaemia

Description
Corrected serum Ca 2+ > 2.65mmol/L.

Clinical features
Symptoms
• Polyuria, polydipsia, dysphagia, bone pain, renal colic
• Muscle weakness

Signs
• Confusion, hypotonia, dysarthria, coma, seizures

Causes
Hyperparathyroidism, malignancy, sarcoidosis, drugs,
Vitamin D intoxication especially in renal patients

Investigations
• ECG- short QT interval, wide QRS complex, flat T, AV block, may have fatal arrhythmias
• Serum Calcium U+Es, albumin, Magnesium, Phosphate, ALP, Serum electrophoresis
• PTH
• X-RAYS
Frequent association with hypokalemia increasing risk of arrhythmias.

Therapy
• Hydrate with Normal Saline 500mls/hr until Urine out > 200mls/hr then reduce 100-200mls per hour.
• Furosemide 1mg/kg only when the patient has been hydrated or if in cardiac failure
• Hemodialysis or peritoneal Dialysis with low Calcium dialysate. Hemodialysis preferred.
• Prednisolone 40mg daily especially for Vitamin D intoxication, sarcoidosis, multiple myeloma, metastasis

• Pamidronate 60-90mg in 500-1000mls Normal Saline infusion over 4-6hrs. should be effective within 48hrs Monitor and replace K+ and Mg2+.

15.4. CATHETER-RELATED BLOODSTREAM INFECTIONS (CRBSI)

Intravenous catheters inserted into central veins such as the internal jugular vein, subclavian vein or femoral vein provide the only and vital access for hemodialysis for patients with no arterio-venous fistulas. Introduction of catheters including venous and urinary catheters increases the risk of bloodstream infections.

In most cases CRBSI can be prevented by simple interventions:

- Hand hygiene
- Using full barrier precautions during the insertion of central venous catheters,
- Cleaning the skin with chlorhexidine,
- Avoiding the femoral site if possible
- Removing unnecessary catheters including urinary catheters as soon as possible

Management of CRBSI

Patients with central venous accesses and new fevers should be evaluated for CRBSI, with the catheter as the source of the infection unless otherwise excluded by patient examination and investigations. The following minimum evaluations should be done.

- Thorough patient history and examination including the central line insertion sites to assess for superficial thrombophlebitis and insertion site abscess
- Two sets of blood cultures obtained from two different sites and another drawn from the central venous access site
- If you suspect bacteremia/sepsis remove catheters and culture the tip to guide antibiotic treatment required.
  Other investigations as determined from history and physical examination of the patient
- Empiric antibiotics guided by local microbiology and susceptibility of organisms

- Vancomycin 1gm IV stat dose and thereafter dosed according to renal function for empiric treatment of Methicillin-Resistant Staphylococcus aureus, Coagulase-Negative Staph, Enterococci species
- For patients unable to tolerate Vancomycin due to deteriorating renal function, switch to Linezolid for the treatment of MRSA and resistant Enterococcus
- Fourth Generation Cephalosporins (Cefepime 2gm IV Stat) or Carbapenems (Doripenem or Meropenem) should be initiated for empiric gram-negative bacteremia such as Pseudomonas that may be resistant to routinely used gram-negative antibiotics.
- If cultures are positive for fungal elements particularly Candida albicans, initiate Caspofungin until sensitivity results are available and switch to Fluconazole if susceptible. Remove the central line immediately in the case of candidemia.

15.5. GLOMERULAR DISORDERS

Five clinical syndromes
- Nephrotic syndrome
- Nephritic syndrome
- Rapid progressive glomerulonephritis
- Asymptomatic Hematuria or and proteinuria
- Chronic glomerulonephritis

15.5.1. Nephrotic syndrome

Description
- At least 3.5g proteinuria in 24hrs Generalised oedema
  Low serum albumin
  Hypercholesterinemia

Causes
- Minimal change disease
- Membranous
- Focal segmental glomerulosclerosis (FSGS)
- Membranoproliferative glomerulonephritis (MPGN)
- Lupus Nephritis
- Diabetic nephropathy
- Amyloidosis

Clinical features

Symptoms
- Facial swelling worse in the morning
- Frothy urine

Signs
- Oedema
- Usually normal BP
- Urine dipstick >2 + proteinuria, hematuria rare except in FSGS

Diagnosis
- Renal biopsy needed for light microscopy, immunofluorescence (IF) and electron microscopy (EM)
- Thus early referral to Nephrologist important

General Management
- Salt restriction
- No need for protein restriction in our setting
- Furosemide 80-120mg/day (aim 0.5-1L/day)
- Proteinuria lowering drugs

–Titrate dose depending on proteinuria
–ACEI: - Enalapril 2.5 – 20mg/day or Perindopril 4-16mg daily
–ARB: - Losartan 25-100mg/day or Micardis 40-160mg/day.
- Lipid-lowering

–Simvastatin 10-40mg daily or atorvastatin 10-20mg daily
- Anti-coagulation (INR 2-3)

–Only if albumin < 20g/l, bedridden, very rapid diuresis, otherwise do not use routinely
–Warfarin daily

Pathological classification
a) Minimal change disease (MCD)
Description
Pathologically no glomerular changes on light microscopy but podocytes are effaced on electron microscopy Presents with nephrotic syndrome

Causes
- Idiopathic
- Secondary; NSAIDS, bee sting, lymphomas

Therapy
Idiopathic MCD

- ACEI/ARB are not used initially in MCD
- Prednisone, 1 mg/kg daily or 2 mg/kg QOD in the morning for a minimum of 8 weeks. (If the response is after 8 weeks, treat for another 2 weeks after response)
- Taper 5 mg/day every 3-4 days to 30, then use QOD, taper 5 mg/dose/week to 0.
- If relapse while tapering (steroid dependent) retreat with 4-week course.
- If relapse off steroids, retreat with 4-week course.
- If the patient remains steroid-dependent or has > 3 relapses/year can use low dose prednisone (10-15 mg) for a year to maintain remission,
- If using more than 0.3-0.4 mg/day of prednisone long term, treat with cyclophosphamide 2 mg/kg PO for 12 weeks.

Steroid resistance is usually defined as no response
after 16weeks of 1 mg/kg.

b) Membranous

Pathologically immune deposits are visible just above or within the glomerular basement membrane Presents with nephrotic syndrome

Immune Causes

- Idiopathic – 80%
- Infections -HBV, HCV, syphilis, schistosomiasis, malaria
- Drugs- penicillamine, NSAIDS, Captopril, Gold
- Malignancies- lung, breast, thyroid, GI
- Autoimmune: - SLE, Thyroid disease

Management

Membranous nephropathy: Approach to therapy based on the risk of progression (6-month observation)

Feature/risk risk	***Low risk***	***Medium risk***	***High***
Urine protein	*< 4*	*>4 but <8*	*>8*
GFR (onset)	*Normal*	*Normal*	*Normal or low*
GFR (6 months)	*Stable*	*Stable*	*Stable or declining*
Risk ESRD (10 years)	*< 10%*	*55%*	*66-80%*

Therapy	***ACEI/ARB***	*Steroids, MMF***	*Steroids, CSA**, MMF****
Conservative,		*CTX*, CSA***	

CTX* - cyclophosphamide, CSA** - cyclosporine, MMF*** - Mycophenolate

• Prednisone (0.5 mg/kg/day) and Cyclophosphamide
(1.5-2.0 mg/kg/day) po for 6 months OR Cyclosporine 3.5 ng/ml for 12-24 months (keep levels 110-170 ng/ml (or FK .05 mg/kg in bid dose to level 3-5 mg/L) (plus prednisone 0.15 mg/kg to max 15mg)
• Prophylaxis
–INH 300mg od po
–Co-trimoxazole (single dose) 2 tab OD PO
–Fluconazole 100-200mg OD PO
–At least for 3 months

IF NO RESPONSE IN 6 MONTHS
• Methylprednisone 1.1g IV x 3 and then Prednisolone
0.5 mg/kg x 27 days; Chlorambucil 0.2 mg/kg (or Cyclophosphamide, 2 mg/kg) daily x 30 days.
• Alternate these monthly for 6 months. Do not initiate immunosuppression if sepsis suspected or present.
• Do not initiate immunosuppression if sepsis suspected or present

a) Focal Segmental Glomerulosclerosis (FSGS)

Description

Pathologically < 50% of all glomeruli affected and of the affected glomeruli, < 50% of their tuft is affected. Presents commonly with Nephrotic syndrome, asymptomatic hematuria and proteinuria

Causes
- Idiopathic
- Collapsing (HIV), collapsing (non-HIV)
- Low birth weight. prematurity
- Obesity
- Sickle cell anaemia,

- Anabolic steroids, Heroin, Lithium, pamidronate

Therapy
- General measures for Nephrotic syndrome

Idiopathic FSGS
- Conservative therapy (ACEI/ARB/aldosterone blocker)
- Exclude secondary causes
- Prednisone, 1 mg/kg daily (or 2 mg/kg alt days) for 12-16 weeks (20% CPR at 8 weeks, 50% at 16weeks)
- May go to 6 months if no steroid contraindication and/or bad prognostic signs are present.
- If clinical remission (CR) continue for 2 weeks and taper over 2-3 months using QOD regimen. If urine protein increases to >2.0 gm/day, start CSA.
- If no response at all by 16 weeks, taper and start CSA.
- Steroid resistance is usually defined as no response after 4 months of 1 mg/kg prednisone.
- If the disease is non-immunologic such as genetic, drug-induced or viral, use only low dose steroids (0.15 mg/kg) with a calcineurin inhibitor).

Guidelines for use of cyclosporine
- Do not use if GFR <40ml/min or severe interstitial or vascular disease on biopsy.
- Use 3-5 mg/kg in divided doses and monitor trough levels (100-200 ng/ml).
- Use concomitant low dose prednisone (0.15 mg/kg, maximum 15mg) until remission.
- Treat for 6 months after a CR or 12 months after a Partial Remission (PR) occurs and taper slowly over several months. The relapse rate is determined by the duration of therapy.
- Tacrolimus is an alternative to cyclosporine

Indications for use of Cyclosporine
- Steroids are contra-indicated
- Proteinuria does not diminish by 50% or more after 4 months of steroids.
- Patient is steroid-dependent
- Relapse in < 1 year after CR or PR
- There is a significant increase in proteinuria during steroid taper after CR or PR
- GFR must be >40 ml/min and interstitial/ vascular disease on biopsy minimal
- The cause of FGS is not immunologic

FSGS due to HIVAN

- General measures
- cART
- May add prednisolone after six months if the maximum dose of ACEI reached but still proteinuric.

b)MPGN

Description

Glomerular disease with subendothelial immune deposits forming a double basement membrane or a dense basement membrane

Causes

- Idiopathic
- HCV, HBV, Infective endocarditis, Shunts, abdominopelvic sepsis

Clinical features

- Nephrotic syndrome – see Description above
- Nephritic syndrome – see Description below

Therapy

- General measures for the treatment of Nephrotic syndrome
- Treat secondary cause

c) LUPUS Nephritis

Description

Glomerular disease as a result of chronic autoimmune, multisystem, inflammatory connective tissue disorder of unknown cause (SLE)

Clinical presentation

- Nephrotic syndrome – see Description above
- Nephritic syndrome – see Description below
- Rapid progressive glomerulonephritis – see Description below
- Asymptomatic proteinuria or and hematuria
- Proteinuria or hematuria without any other renal symptoms
- Chronic glomerulonephritis
- Disease with irreversible damage to the kidney. GFR will not improve despite intervention but may delay further drop in GFR

Diagnosis

• Should meet criteria for the diagnosis of Lupus and look for systemic features; CNS (psychosis, fits), Cardiac

(pericarditis), Respiratory (pleuritis), hematologic (Thrombotic microangiopathy, leukopenia), rheumatologic (arthritis), dermatologic (malar rash, discoid rash, photosensitivity, mucosal ulcers) renal(hematuria, proteinuria) immunologic (low C3/C4), GIT (serositis), ANA, ds DNA, anti-Sm

- Should have 4 of the 11 manifestations
- Biopsy needed for LUPUS as histological diagnosis defines treatment

Therapy

- Depends on histological staging (stage 1-6)
- 1 and 2 do not need immunosuppression

–Stage 2 may need treatment if 24hr protein >1g. then give prednisolone 20-40mg/day for 1

-3months and taper to 5-10mg/day

- Stage 5 follow guidelines for membranous nephropathy.
- Stage 6 damage already done and do not need active immunosuppression but follow measures for the management of CKD.

Stage 3 and stage 4

- Induction phase treatment for 24 weeks with:

–Mycophenolate Mofetil (MMF) 1- 1.5g bd or

–IV Cyclophosphamide 0.5-1.0g/m^2 monthly

–Plus oral prednisolone 60mg/day (1mg/kg) with taper

–Do not initiate immunosuppression if sepsis suspected or present.

- Prophylaxis

–INH 300mg od PO

–Co-trimoxazole (single dose) 2 tab od PO

–Fluconazole 100-200mg od PO. Give at least for 3months

- Maintenance up to at least 18 months

–MMF 1 – 1.5g bd PO or

– Azathioprine 1-3mg/kg/day po

– IV cyclophosphamide 0.5-1.0g/m2 every 3 months

– Plus prednisolone 5-10mg/day

d)Diabetic Nephropathy

Description

Persistent microalbuminuria or proteinuria on albustix or dipstick respectively and or urine albumin: creatinine ratio. Persistent means tests should be done three months apart.

Clinical presentation

Symptoms

- Asymptomatic proteinuria, microalbuminuria
- Body swelling

Signs

- No clinical signs on general examination
- Pedal Edema, facial puffiness
- Presence of Diabetic neuropathy and retinopathy makes the diagnosis of nephropathy more likely
- Classical presentation of diabetic nephropathy does not require renal biopsy but atypical presentation need a renal biopsy. These include:

–Rapid drop in GFR over a few days to weeks
–Diabetic with hematuria
–Proteinuria in presence of HIV, Hepatitis B, SLE, small vessel vasculitis (ANCA positive)

Management

- General Measures of managing Nephrotic syndrome
- Target BP < 125/75
- Target HBAc1 < 6.5%
- Low dose aspirin 75-150mg daily

e) Amyloidosis
AL-primary
AA- secondary

15.5.2. Nephritic syndrome

Description and clinical presentation

- Mild proteinuria
- Hematuria
- High blood pressure
- Acute reduction in GRF
- Some oedema

Causes
Reduced complement

- Post streptococcal Glomerulonephritis
- Shunt Nephritis

- Endocarditis
- SLE
- HCV
- Athero-emboli GN

Normal compliment
- IgA
- HSP
- Anti-GBM
- ANCA positive GN

Clinical features
History of sore throat especially children, features of lupus, purpura(HSP, HCV), peripheral neuropathy (HSP, HCV), pulmonary haemorrhage (ANCA), chronic sinusitis (ANCA), associated asthma (ANCA)

Diagnosis
- ANA, ANCA, ds-DNA, ASOT, DNAse, HBsAg, AntiHCV, anti-GBM, RPR, C3, C4
- Renal biopsy except for post-streptococcal

Therapy
a) Post streptococcal
- Supportive
- BP control
- Antibiotic
- Fluid management
- Dialysis when indicated
- Prognosis good

b) ANCA positive/Anti-GBM
- See under Rapid Progressive Glomerulonephritis

c) Systemic Lupus Erythematosus
- See Lupus Nephritis

d) Others (HBsAg, HCV, IgA, HSP, Shunt nephritis)
- Treat cause

15.5.3. Asymptomatic hematuria/proteinuria

Description/Features

- Isolated proteinuria/hematuria with no other features like hypertension, Edema, renal dysfunction, etc.
- Common Causes in our setting
- Diabetes Mellitus
- SLE
- HIVAN
- FSGS
- UTI
- IgA/HSP

Therapy

Reassure patient and follow up according to underlying disease

15.5.4. Rapid Progressive Glomerulonephritis

Description

- Sub-acute reduction in renal function as opposed to acute nephritis that is rapid.
- Takes a few weeks to few months for renal function to deteriorate

Clinical features

Similar to acute nephritis except this is more insidious, Hemoptysis, asthma, sinusitis, epistaxis, abdominal pain, peripheral neuropathy, petechiae, purpura.

Causes

- Type 1

– Anti-Glomerular basement disease (Anti-GBM)

- Type 2

– Immune complex disease

– SLE

– Post streptococcal

– IgA/HSP

- Type 3: ANCA positive
- Polyangiitis with granulomatosis (Wegners)
- Eosinophilic granulomatosis with polyangiitis (Churg Strauss)
- Microscopic polyangiitis

Management

- Serum p-ANCA and C-ANCA
- Renal biopsy is mandatory for light, Immunoflourence, electron microscopy.

1. Anti-GBM RPGN
a. Prednisolone 60 mg/day and reducing
b. Cyclophosphamide 2mg/kg/day and adjusted for white cell count
c.Plasma exchange (50ml/kg to a maximum of 4L daily for 14 days or until anti-GBM antibodies undetectable)
d.Treat for 6 months
2. Immune complex RPGN
a. except for Streptococcal, treat as in 3 except plasma exchange may not be indicated

3. ANCA positive RPGN
a. Methylprednisolone 7mg/kg for 3days and then prednisolone 1mg/kg/day for 4 weeks then taper with either
b. Cyclophosphamide 0.5g/m^2 IV monthly for 6 months OR
c. Cyclophosphamide 2mg/kg PO for 6-12 months
d. Plasma exchange for patients with lung haemorrhage and renal dysfunction
e. Co-trimoxazole prophylaxis.

15.5. HYPERTENSION

(See detail on hypertension under section 7.1)

15.5.1. Malignant hypertension

Description
a. BP >180/120
b. Fundal changes/encephalopathy
c. Proteinuria or increased urea/creatinine
d. Thrombotic microangiopathy

Common causes
a. Chronic kidney disease (small kidney on U/S)
b. Acute Nephritis
c. Renal vascular disease (one kidney 1.5cm than the other kidney on U/S)
d. Scleroderma renal crisis
e. Cocaine
f. Other endocrine diseases: - Conn’s, Cushing’s syndrome, etc.

Clinical features
a. As above but look for signs of possible aetiology
b. Suspect in elderly Diabetics (atherosclerotic) and young women (fibromyoplasia)

Management
a. FBC- thrombocytopenia
b. Peripheral smear – RBC fragments
c. Urinalysis
d. U+Es
e. Specific tests to rule out aetiology like kidney sonar, MRI angiogram to rule out renovascular disease

Therapy
a. Check under cardiovascular disorders
b. ACEI should be given if scleroderma
c. Renal vascular disease needs referral to a specialist if suspected and BP unresponsive
Increase of serum creatinine <30µmol/l from baseline should not prompt withdraw of ACEI but monitor closely
d. If dialysis needed peritoneal dialysis preferred to allow possible recovery. Recovery may take up to several months.

15.5.2. Hypertension or kidney disease in pregnancy

(See HYPERTENSION IN PREGNANCY FOR OTHER DETAILS)

Effects of Pregnancy on kidney
1)Hemodynamic changes lead to hyperfiltration
2)Presence of HTN, Uremia
3)Facts that may predict deterioration
4)Proteinuria
5)Intercurrent pregnancy-related illnesses e.g. Pre-eclampsia
6)Possibility of permanent loss of function Kidney on pregnancy

Effects of Kidney disease on pregnancy

1)Risk of pre-eclampsia
2)Prematurity
3)IUGR
LUPUS Versus Pre-Eclampsia/Eclampsia

Other conditions that may present like pre-eclampsia or eclampsia or HELLP need to be considered.

LUPUS

	Lupus flare	***Pre-Eclampsia***
PROTEINURIA	+	+
HTN	+	+
RBC CASTS	+	-
AZOTEMIA	+	+/-
C3/C4	+	+/-
ABNORMAL LETs	-	-
LOW PLTS	+	+
LOW WBC	+	-

Thrombotic microangiopathy disorders

– Thrombotic thrombocytopenic purpura

– Hemolytic Uraemic syndrome

Acute Fatty Liver of Pregnancy

Other conditions that may mimic HELLP in pregnancy

	HELLP/Eclampsia	*AELP*	*TIP*	*HUS*
Hypertensiom	*80%*	*25-50%*	*Occasional*	*Present*
Renal Dysfunction	*Mild to moderate*	*Moderate*	*Mild to moderate*	*Severe*
Fever/Neurological signs/	*++*	*0*	*++*	*0*
Onset	*3rd trimester*	*3rd trimester*	*Anytime*	*Postpartum*
Platelet count	*Low*	*Low*	*Low*	*Low*
LFTs	*High*	*Very high*	*Usually normal*	*Usually normal*

PTT	*Normal to high*	*High*	*Normal*	*Normal*
Antithrombin III	*Low*	*Low*	*Normal*	*Normal*

LUPUS and PREGNANCY

Poor Outcomes

- Active disease at conception
- Disease first appearing in pregnancy
- HTN, Azotemia in 1st trimester
- High titres of lupus anticoagulant,
- Antiphospholipid antibodies

Antiphospholipid antibody in pregnancy

- Increase fetal loss
- Venous and arterial thrombosis
- Renal vasculitis
- Thrombotic microangiopathy
- Pre-eclampsia
- Treatment- ASA, Heparin

15.6. RENAL AND PANCREATIC TRANSPLANT

15.6.1. Criteria for Renal or/and Pancreatic Transplant

ESKD patients who meet the following criteria will be suitable for recommendation for Renal or/and Pancreatic Transplant:

- No malignancy or free of malignancy for at least 5 years
- No serious cardiovascular disease or ischemic heart disease (minimum Ejection Fraction of 40%)
- No Major pulmonary disease
  – No major restriction or obstruction
- No major urological disease
- No major psychiatric illness
- BMI< 35 kg/m^2
- Low preformed antibodies (PRAs). High PRAs are associated with the following – Multiple pregnancies

– Multiple blood transfusions

– Prior failed transplant

- GI disorders should have been addressed
- PUD
- Pancreatitis
- Diverticulitis
- Infections

- HIV patients can be transplanted as long as they meet the following:
  – CD4 >200copies/ml
  – On HAART for at least 6 months
  – VL undetectable
  – Adherence with cART
- All other active infections should be treated first

– Special considerations should be taken for HBV and HCV

- Should not a smoker or chronic alcoholic

The basic work-work up for a recipient should include the following:

a. Serum/blood

- HIV test
- HBsAg
- Anti-HCV
- Anti-CMV
- Anti-EBV
- Anti-HTLV-1
- RPR
- Blood group
- PRAs
- X match for CDC and flow cytometry

b. Imaging/Invasive

- CXR
- Doppler US of femoral/iliac veins
- ECG
- VCU
- Gastroscopy
- Doppler of carotids for Diabetics
- Other tests will be dependent on the condition of patients

c. Other aspects that patient need to meet which are dependent on dialysis adequacy

- CaPO4 product should be acceptable
- PTH within recommended levels
- Hb 11-12g/dl
- Potassium normal

A checklist should be done the day before transplant to make sure the candidate is ready if possible do the tests.

Repeat HIV test as well unless already HIV positive Patients should be fully examined the day before transplant and ensure no comorbidity

d. Stop-or-go Strategy for Evaluation of a Potential Living Donor

- Blood group determination: Stop if incompatible with recipient blood group….
- Plasma Urea, creatinine; proteinuria; urinary sediment:

Stop if abnormal

- Viral tests: HBV, HCV, HIV Stop if positive
- Renal ultrasound: stop if solitary kidney
- HLA A, B, DR, DP and DQ typing
- CDC Crossmatch; FC crossmatch: Stop if positive (T-cell positive X match with IgG)

e. Full medical evaluation of the potential donor

- BMI, blood pressure, cardiac evaluation (at least EKG and ultrasound)
- Aorto-iliac CT scan, and renal angiography; urography
- Measurement of GFR: Cr51-EDTA, iohexol, or other methods
- Blood glucose, HbA1c, cholesterol, microalbuminuria
- Liver enzymes, alkaline phosphatases, gGT
- Gynecologic evaluation: mammography, uterine cervix smear
- Prostate evaluation, clinical and PSA
- Evaluation of skin, lung, thyroid, infectious diseases, etc.
- Psychologic/ psychiatric evaluation
- Validation by urologist and anesthesiologist

f. The best kidney donor

- Iso blood group and HLA identical
- Less than 50 years
- Normal BP (< 140/90 mmHg)
- BMI < 25 Kg/m2
- GFR > 80 ml/min/ 1.73m^2
- Proteinuria < 300 mg/day; microalbuminuria <30mg/d
- No hematuria
- No diabetes nor dyslipidemia
- No cardiac disease or history of cancer
- No infectious (viral) disease

15.6.2. Immunosuppression in Live-donor Kidney Transplant patients

- Immunosuppression can be started PRIOR to transplantation, e.g. one week before; this aims at achieving efficient immunosuppression.
- This might result in avoiding induction therapy with ant lymphocyte preparations or monoclonal anti-IL2 receptor antibody
- The HLA matching (D/R) can sometimes be very good, thereby allowing "lighter" immunosuppression, e.g. avoiding the use of calcineurin inhibitors
- There is no cold ischemia time: thus the risk of delayed graft function is almost nil, decreasing the risk of acute rejection

15.6.4. Immunosuppression protocols

- Calcineurin inhibitors (Cyclosporine OR Tacrolimus) plus antiproliferative agent (azathioprine-AZA- OR mycophenolate mofetil – MMF) with OR without steroids
- With or without induction therapy: anti-lymphocyte agents –ATG- OR anti-IL2 receptor monoclonal antibodies, e.g. basiliximab, daclizumab
- Calcineurin inhibitors can be avoided (from the beginning or after a few months) provided there is the use of mTOR-inhibitors such as sirolimus or everolimus

Induction

- Basiliximab 20 mg pre-operative and day 4
- Methylprednisolone 500mg-1000mg day 0 (in operating theatre)
- MMF or Azathioprine 1.5g or 1-3mg/kg/day respectively
- 4. Cyclosporine 8-12mg/kg stat or Tacrolimus 0.15-0.30mg/kg/day bd.

Maintenance

- MMF 1.5g BD PO or Azathioprine 1-3mg/kg/day
- Cyclosporine or Tacrolimus (dose adjusted according to C-2 levels or Tacrolimus levels)
- Prednisolone 60mg first day and taper down fast as long as creatinine remains stable. By end of the month, the dose should be 20mg or less.

Prophylaxis

- INH 300mg od for 6 months
- Valacyclovir 450mg bd PO (depending on CMV status of "donor and recipient") for 3 months

- Nystatin suspension 10mls od PO for 3months
- Amphotericin B oral suspension for 3 months

- Co-trimoxazole 960mg od PO for 6 months

Tacrolimus or Cyclosporine levels to be done daily till discharge then twice weekly then weekly, fortnightly and so on.

Kidney ultrasound and renogram will be routine within 5 days of transplant

Acute rejection will be defined based on an increase in serum creatinine or amylase (urine as well) and renal biopsy.

Rejection will be managed under the direct supervision of a Nephrologist but will require induction agents like ATG or Methylprednisolone or/and modification of maintenance regimen.

15.6.5. Fertility and Pregnancy post-transplant

- Fertility restored
- Pregnancy outcomes improve if renal function is normal and hypertension absent
- Pregnancy accelerates graft loss
- Advisable to wait for 2 years
  - So that renal function stabilises
  - Lowest doses of Immunosuppressive
  - Cyclosporine, prednisolone, Azathioprine safe, MMF no experience.

16. MEDICINE SAFETY MONITORING (PHARMACOVIGILANCE)

Monitoring the safety of medicines is a critical component of Zambia's national patient monitoring system as knowledge of adverse drug reactions and drug interactions helps to generate much-needed safety data to help improve care and treatment outcomes for patients and consumers of medicinal products.

All healthcare workers, recipients of care/consumers, manufacturers/distributors and the general public are encouraged to report safety issues such as adverse drug reactions, medication errors and quality problems. Everyone is encouraged to report as soon as possible even when not sure or does not have all the information. Reporting can be made using various tools which the Ministry of Health has put in place through the Zambia Medicines Regulatory Authority (ZAMRA). These reporting tools are:

1. Paper ADR report form which can be accessed from your pharmacy department
2. Mobile phone application Med Safety for android and IOS platforms found on Play Store and iStore respectively
3. Electronic reporting form on the ZAMRA website; http://www.zamra.co.zm

Note: Paper ADR reporting forms should be submitted/sent/mailed as soon as possible to:

The National Pharmacovigilance Unit (NPVU)
Zambia Medicines Regulatory Authority
P.O Box 31890, Lusaka, Zambia
Email: pharmacy@zamra.co.zm
Tel: +260211220429

In the event one is unable to submit directly to NPVU at ZAMRA, forms can be submitted through the following reporting centres:

1) ZAMRA regional offices
2) Regional Pharmacovigilance centers
3) District Health Office
4) Provincial Health Office
5) Responsible officer/In-charge of the dispensary or community pharmacy
6) Posted at the nearest post office (Zambia Postal Services)

ZAMBIA ESSENTIAL MEDICINE LIST (ZEML)

	Medicine	*Presentation*	*Level*	*VEN*
1	***Medicines used in anaesthesia***			
1.1	***General anaesthesia***			
1.1.1	***Intravenous and intramuscular anaesthetics***			
1.1.1.1	*Propofol*	*Emulsion for injection 10mg/ml*	*II - IV*	*V*
1.1.1.2	*Ketamine*	*Solution for injection 10mg/ml*	*II - IV*	*V*
1.1.1.3	*Etomidate*	*Powder for injection 1g and 500mg vials*	*II - IV*	*V*
1.1.1.4	*Thiopental sodium*	*Powder for injection 500mg vials*	*II - IV*	*V*
1.1.2	***Volatile inhalation anaesthetics***			
1.1.2.1	*Sevoflurane*	*Inhalation liquid 250ml*	*II - IV*	*V*
1.1.2.2	*Isoflurane*	*Inhalation liquid 250ml*	*II - IV*	*V*
1.1.2.3	*Halothane*	*Inhalation liquid 250ml*	*II - IV*	*V*
1.1.3	***Local anaesthetics***			
1.1.3.1	*Lignocaine*	*Solution for injection 2% w/v, 20mls*	*II - IV*	*E*
1.1.3.2	*Lignocaine with Adrenaline dental*	*Solution for injection*	*I - IV*	*E*
1.1.3.3	*Bupivacaine without preservatives*	*Solution for injection 50mg/ml, (2ml)*	*II - IV*	*E*
1.1.3.4	*Bupivacaine*	*Solution for injection 0.5% w/v*	*II - IV*	*E*
1.1.3.5	*Bupivacaine with glucose*	*Solution for injection 0.5% + 8% w/v*	*I - IV*	*E*
1.1.4	***Anticholinesterases***			
1.1.4.1	*Neostigmine*	*Solution for injection 2.5mg/ml, (1ml)*	*II - IV*	*V*

	Medicine	Presentation	Level	VEN
2	**Medicines acting on Gastrointestinal System**			
2.1	**Antacids**			
2.1.1	Aluminium hydroxide + Magnesium trisilicate	Gel, Chewable tablets	I - IV	E
2.1.2	Aluminium hydroxide	Gel 4%; Tablets 500mg, Oral suspension 4%	I - IV	E
2.1.3	Magnesium trisilicate	Chewable tablets 250mg	I - IV	E
2.1.4	Sodium citrate	Chewable tablets	I - IV	E
2.2	**Antispasmodics**			
2.2.1	Hyoscine butyl bromide	Solution for injection 20mg/ml (1ml), Tablets 10mg	II - IV	E
2.3	**Anti-ulcer medicines**			
2.3.1	Cimetidine	Tablets 200mg, 400mg, 800mg; Syrup/suspension 200mg/5ml, Solution for injection 100mg/ml	II - IV	E
2.3.2	Ranitidine	Tablets 150mg, 300mg, Solution for injection 25mg/ml	II - IV	E
2.3.3	Famotidine	Tablets 20mg, 40mg	II - IV	E
2.3.4	Omeprazole	Tablets 10mg, 20mg	II - IV	E
2.3.5	Esomeprazole	Tablet/capsule20mg/40mg, Solution for injection 20mg	I - IV	E
2.4	**Antidiarrhoeals**			
2.4.1	Codeine phosphate	Tablets 15mg, 30mg, 60mg	II - IV	E
2.4.2	Loperamide	Tablets/Capsules 2mg, Syrup 1mg/ml	II - IV	E

	Medicine	Presentation	Level	VEN
2.5	**Laxatives**			
2.5.1	Lactulose	Suspension	III	E
2.5.2	Glycerol	Suppository 1g, 4g	I - IV	E
2.5.3	Senna	Tablets 7.5mg, Suppositories	I - III	E
2.5.4	Bisacodyl	Tablets 5mg	I - IV	E
2.6	**Medicines used for treating haemorrhoids**			
2.6.1	Bismuth subgallate + Zinc oxide + Lidocaine hydrochloride	Suppository, Cream	II - IV	E
3	**Medicines acting on the Central Nervous System**			
3.1	**Anxiolytics and Antipsychotics**			
3.1.1	Clonazepam	Tablet 0.5mg	III - IV	E
3.1.2	Lorazepam	Tablets 2mg	III - IV	E
3.1.3	Midazolam	Solution for injection 5mg, 15mg	III - IV	E
3.1.4	Diazepam	Tablets 2mg, Solution for injection 5mg/ml (2ml)	I - III	V
3.2	**Selective serotonin reuptake inhibitors**			
3.2.1	Fluoxetine	Tablets 20mg, 50mg	II - III	E
3.2.2	Sertraline	Tablet 60mg	IV	E
3.2.3	Duloxetine	Tablet 5mg	IV	E
3.2.4	Citalopram	Tablet 10mg, 20mg	IV	E

	Medicine	Presentation	Level	VEN
3.3	**Tricyclic Antidepressants**			
3.2.1	Amitriptyline	Tablets 25mg	III	E
3.2.2	Imipramine	Tablets 25mg	III	E
3.2.3	Clomipramine	Tablets 25mg	III	E
3.3	**Mood stabilizers**			
3.3.1	Lithium carbonate	Tablets 300mg	IV	E
3.3.2	Sodium valproate	Tablets 200mg	II - IV	E
3.3.3	Divalproex sodium	Tablet 500mg	IV	E
3.4	**Antiepileptic medicines**			
3.4.1	Carbamazepine	Tablets 200mg, injection 5mg/ml	II - IV	V
3.4.2	Lamotrigine	Tablets 25mg, 50mg	I - IV	V
3.4.3	Ethosuximide	Capsules 250mg	III - IV	V
3.4.4	Phenobarbitone	Tablets 30mg, Solution for injection 200mg/ml	II - IV	V
3.4.5	Phenytoin	Tablets 100mg, Solution for injection 250mg	II - IV	V
3.4.6	Sodium valproate	Tablets 200mg, Syrup 200mg/5ml	II - IV	V
3.4.9	Gabapentin	Tablets 600mg, Oral solution 250mg/5ml	IV	E
3.4.10	Levetiracetam	Tablets 200mg	IV	E

	Medicine	Presentation	Level	VEN
3.5	**Medicines used in Parkinsonism and related disorders**			
3.5.1	Bezhexol	Tablets 5mg	II - IV	V
3.5.2	Bromocriptine	Tablets 2.5mg	III - IV	E
3.5.3	Procyclidine	Tablets 5mg, injection 5mg/ml,(2ml)	I - IV	E
3.6	**Medicines used for Nausea and Vomiting**			
3.6.1	Cyclizine	Tablets 50mg, Solution for injection 50mg/ml	IV	E
3.6.2	Domperidone	Tablets 10mg	II - IV	E
3.6.3	Metoclopramide	Tablets 10mg, Solution for injection 5mg/ml (2ml)	II - IV	E
3.6.4	Prochlorperazine	Tablets 5mg	III - IV	E
3.6.5	Promethazine	Tablet 25mg, Solution for injection 25mg/ml (2ml)	I - IV	V
3.6.6	Ondansetron	Tablets 4mg, Oral suspension 2mg, Solution for injection 8mg/2ml	II - IV	E
3.7	**Analgesics**			
3.7.1	**Non-opioids analgesics**			
3.7.1.1	Paracetamol (Acetaminophen)	Tablets 100mg, 500mg, Suppository 125mg, 250mg, Syrup 120mg/5ml	I - IV	V
3.8	**Non-Steroidal anti-Inflammatory Medicines**			
3.8.1	Aspirin	Tablets 75mg, 300mg	II - IV	E
3.8.2	Ibuprofen	Tablets 200mg, 400mg	II - IV	E

	Medicine	Presentation	Level	VEN
3.8.3	Diclofenac	Tablets 50mg, 100mg, Solution for injection 75mg	II - IV	E
3.8.4	Mefenamic acid	Tablets 250mg, 500mg, Suppository 125mg	II - IV	E
3.9	**Opioid analgesics**			
3.9.1	Morphine	Powder, Oral syrup 10mg/5ml, Solution for injection 10mg/ml ampoule	II - IV	V
3.9.2	Pethidine	Tablets 50mg, Solution for injection 50mg/ml	II - IV	V
3.9.3	Tramadol	Tablets 50mg, Solution for injection 50mg/ml	II - IV	E
3.9.4	Fentanyl	Solution for injection 50mcg/ml	II - IV	E
3.10	**Anti-migraine medicines**			
3.10.1	Ergotamine tartrate	Tablets 1mg	II - IV	E
4	**Medicines used in the treatment of infections**			
4.1	**Antibacterial medicines**			
4.1.1	**Penicillins**			
4.1.1.1	Benzathine penicillin	Powder for injection 2.4 MU vial	I - IV	E
4.1.1.2	Benzylpenicillin	Powder for injection 5 MU vial	I - IV	V
4.1.1.3	Phenoxymethylpenicillin	Tablets 250mg, Oral suspension 125mg/5ml	I - IV	E

	Medicine	Presentation	Level	VEN
4.1.2	**Broad-spectrum penicillins**			
4.1.2.1	Amoxycillin	Tablets/Capsules 250mg, Syrup 125mg/5ml	I - IV	V
4.1.2.2	Ampicillin	Powder for injection 500mg vial	III - IV	V
4.1.3	**Penicillinase-resistant penicillins**			
4.1.3.1	Amoxicillin + Clavulanic acid (Co-amoxiclav)	Tablets 375mg (250mg + 125mg), 625mg (500mg + 125mg)	III - IV	E
4.1.3.2	Cloxacillin	Capsules 250mg, Powder for injection 500mg	II - IV	V
4.1.3.3	Flucloxacillin	Capsules 250mg, Powder for injection 250mg	III - IV	E
4.1.4	**Aminoglycosides**			
4.1.4.1	Gentamicin	Solution for injection 40mg/ml, (2ml)	I - IV	V
4.1.5	**Sulphonamides**			
4.1.5.1	Sulfamethoxazole + Trimethoprim (Co-trimoxazole)	Tablets 120mg, 480mg, Oral suspension 240mg/5ml, Solution for injection 480mg	I - IV	V

	Medicine	Presentation	Level	VEN
4.1.6	**Quinolones**			
4.1.6.1	Ciprofloxacin	Tablets 250mg, 500mg Solution for injection 2mg/ml 100ml,100ml bottle	III - IV IV	E
4.1.6.2	Nalidixic acid	Tablets 500mg, Oral suspension 30mg/5ml	I - IV	V
4.1.6.3	Ofloxacin	Tablets 400mg, Solution of injection 2mg/ml	I - V	E
4.1.7	**Nitro-furan medicines**			
4.1.7.1	Nitrofurantoin	Tablets 100mg	I - IV	E
4.1.8	**Macrolides**			
4.1.8.1	Erythromycin	Tablets 250mg, Powder for injection 500mg vial, Oral suspension 125mg/5ml	I - IV	V
4.1.8.2	Azithromycin	Capsules/Tablets 250mg, Oral suspension 200mg/5ml	II - IV	V
4.1.8.3	Clarithromycin	Tablet 250mg, 500mg	II - IV	V
4.1.9	**Lincosamides**			
4.1.8.3	Clindamycin	Capsules 75mg, Oral suspension 75mg/5ml, Solution for injection 150mg/ml	III - IV	E
4.1.10	**Cephalosporins and Cephamycins**			
4.1.9.1	Cefotaxime	Powder for injection 1g, 250mg vial	III - IV	E
4.1.9.2	Cefoxitine	Powder for injection 1g, 2g vial	II - IV	E

	Medicine	Presentation	Level	VEN
4.1.9.3	Ceftriaxone	Powder for injection 250mg,1g vial	II - IV	E
4.1.9.4	Cephalexin	Tablets/ Capsules 250mg, Oral suspension 125mg/5ml	III - IV	E
4.1.9.5	Cefuroxime	Tablets 250mg,500mg, Oral suspension 125m/5ml	III - IV	E
4.1.9.6	Cefepime	Powder for injection 1g, 2g vial	III - IV	E
4.1.10	**Tetracyclines**			
4.1.10.1	Doxycycline	Tablets/Capsule 100mg	I - IV	E
4.1.10.2	Tetracycline	Capsule 250mg, Eye ointment 3%	I - IV	E
4.1.11	**Nitroimidazoles**			
4.1.11.1	Metronidazole	Tablets 200mg, Solution for infusion 5mg/ml 100mls, Oral suspension 100mg/5ml, 100ml	I - IV	V
4.1.11.2	Tinidazole	Tablets 500mg	I - IV	E
4.1.12	**Other antibacterials**			
4.1.12.1	Chloramphenicol	Capsules 250mg, Oral suspension 125mg/5ml, Powder for injection 1g vial	III - IV	V

	Medicine	Presentation	Level	VEN
4.2	**Anti-tuberculosis medicines**			
4.2.1	Rifampicin + Isoniazid	Tablets 150mg + 75mg	HC, I - IV	V
4.2.2	Rifampicin + Isoniazid	Tablets 75mg + 50mg	I - IV	V
4.2.3	Rifampicin + Isoniazid + Ethambutol	Tablets 150mg + 75mg + 275mg	I - IV	V
4.2.4	Rifampicin + Isoniazid + Pyrazinamide	Tablets 75mg + 50mg + 150mg	I - IV	V
4.2.5	Rifampicin + Isoniazid + Ethambutol + Pyrazinamide	Tablets 150mg + 75mg + 275mg+ 400mg	I - IV	V
4.2.6	Ethambutol	Tablets 400mg	I - IV	V
4.2.7	Pyrazinamide	Tablets 400mg	I - IV	V
4.2.8	Isoniazid	Tablets 100mg,150mg	I - IV	V
4.2.9	Streptomycin	Solution for injection 1g, 5g vial	I - IV	V
4.2.10	Capreomycin	Powder for injection 1g	I - IV	V
4.2.11	Levofloxacin	Tablets 250mg	I - IV	V
4.2.12	Ethionamide	Tablets 250mg	II - IV	V
4.2.13	Cycloserine	Tablets 250mg	II - IV	V
4.2.14	Bedaquiline	Tablet 100mg	II - IV	V
4.2.15	Delamanide	Tablet 50mg	II - IV	V
4.2.16	Linezolid	Tablet 600mg	II - IV	V
4.2.17	Clofazimine	Tablet 100mg	II - IV	V
4.2.18	Moxifloxacin	Tablet 400mg	II - IV	V

	Medicine	Presentation	Level	VEN
4.3	**Anti-leprosy medicines**			
4.3.1	Clofazimine	Capsules 50mg,100mg	HC I - IV	V
4.3.2	Dapsone	Tablets 10mg,25mg,50mg	HC I - IV	V
4.3.3	Rifampicin	Capsules 150mg, 300mg, Oral syrup 100mg/5ml	HC I - IV	V
4.4	**Antifungal medicines (also see section 12.3 and 13.3)**			
4.4.1	Amphotericin B	Solution for injection 50mg	III - IV	E
4.4.2	Clotrimazole	Topical cream 1%, Vaginal tablet 500mg, Mouth paint	HC, I - IV	E
4.4.3	Fluconazole	Capsule 50mg, 150mg, 200mg, Solution for injection 2mg/ml	I - IV	V
4.4.4	Flucytosine	Tablet 250mg, Solution for injection 10mg/ml	III - IV	E
4.4.5	Griseofulvin	Tablets 125mg, 250mg, 500mg, Oral suspension 125mg/5ml	HC, I - IV	E
4.4.6	Miconazole	Topical cream 2%	I - IV	E
4.4.5	Terbinafine	Tablet 250mg, Topical cream/ointment 1%	II - IV	E
4.4.6	Itraconazole	Tablets 100mg	III - IV	E
4.4.6	Nystatin	Vaginal tablets 100,000 IU, Oral suspension 100,000 IU, Tablets/Capsules 100,000 IU	HC, I - IV	V
4.5	**Anti-protozoal medicines**			
4.5.1	**Antimalarials**			
4.5.1.1	Artemether + Lumefantrine	Tablets 20mg/120mg	I - IV	V
4.5.1.2	Pyrimethamine + Sulphadoxine	Tablets 25mg/500mg	I - IV	V

	Medicine	Presentation	Level	VEN
4.5.1.3	Quinine	Tablets 300mg, Solution for injection 300mg/1ml (2ml)	I - IV	V
4.5.1.4	Artesunate	Powder for injection 60mg,120mg, Suppository 100mg, 200mg Tablet 50mg	HC, I - IV	V
4.5.2	**Amoebocides (See section 4.1.11)**			
4.6	**Trypanomicides**			
4.6.1	Melarsoprol	Solution for injection 3.6%	III - IV	V
4.6.2	Suramin sodium	Powder for injection 1g vial	III - IV	V
4.6.1	Pentamidine isethionate	Powder for nebulizer solution 300mg	II - IV	V
4.8	**Antivirals**			
4.8.1	Acyclovir	Tablets 200mg, 400mg, Topical cream 5%, Solution for injection 50mg/ml, Powder for injection 500mg, 1g vial, Ophthalmic ointment 3%	II - IV	E
4.9	**Antiretroviral Medicines used in HIV infection**			
4.9.1	Abacavir	Tablets 300mg	II - IV	E
4.9.2	Lamivudine	Tablets 150mg	II - IV	E
4.9.3	Zidovudine + Lamivudine	Tablets 60mg + 30mg	II - IV	E
4.9.4	Abacavir + Lamivudine	Tablets 60mg + 30mg, 120mg + 60mg	II - IV	E

	Medicine	Presentation	Level	VEN
4.9.5	Lopinavir/Ritonavir	Oral suspension 80mg/20mg, 100mg/25mg	II - IV	E
4.9.6	Raltegravir	Tablets 100mg	II - IV	E
4.9.7	Tenofovir/Lamivudine	Tablets 300mg/300mg	II - IV	E
4.9.8	Zidovudine	Tablets 100mg, 250mg	II - IV	E
4.9.9	Tenofovir/Lamivudine/Efavirenz	Tablets 300mg/300mg/400mg	II - IV	E
4.9.10	Tenofovir/Lamivudine/Dolutegravir	Tablets 300mg /300mg/50mg	II - IV	E
4.9.11	Tenofovir alafenamide/Emitricitabine/Dolutegravir	Tablets 25mg/200/50mg	II - IV	E
4.9.12	Emitricitabine	Tablets 200mg	II - IV	E
4.9.13	Tenofovir/Emitricitabine	Tablets 300/200mg	II - IV	E
4.9.14	Efavirenz	Tablets 200mg, 400mg	II - IV	E
4.9.15	Nevirapine	Tablets 200mg, Oral suspension 10mg/ml	II - IV	E
4.9.16	Etravirine	Tablets 100mg	II - IV	E
4.9.17	Ritonavir	Tablets 100mg	II - IV	E
4.9.18	Lopinavir/Ritonavir	Tablets 80/20mg, 200/50mg	II - IV	E
4.10	**Antihelminthics**			
4.10.1	Mebendazole	Chewable tablets 100mg, 500mg	HC, HP, I - IV	E
4.10.2	Niclosamide	Tablets 500mg	I - IV	E
4.10.3	Pyrantel pamoate	Tablets 125mg, Oral suspension 250mg/5ml	I - IV	E
4.10.4	Thiabendazole	Tablets 500mg	II - IV	E
4.10.5	Albendazole	Tablets 400mg	II - IV	E

	Medicine	Presentation	Level	VEN
5.2	**Medicines acting on the thyroid**			
5.2.1	Carbimazole	Tablets 5mg	III - IV	E
5.2.2	Iodine aqueous	Oral solution	III - IV	E
5.2.3	Thyroxine	Tablets 50mcg, 100mcg	III - IV	V
5.3	**Corticosteroids**			
5.3.1	Dexamethasone	Tablets 500mcg, Solution for injection 5mg/ml (5ml)	III - IV	V
5.3.2	Hydrocortisone sodium succinate	Powder for injection 100mg vial	I - IV	V
5.3.3	Prednisolone	Tablets 5mg	I - IV	V
5.4	**Oestrogens and progestogens**			
5.4.1	Norethisterone	Tablets 5mg	III - IV	E
5.4.2	Conjugated Oestrogens	Tablets 625mcg	III - IV	E
5.5	**Androgens and anti-androgens**			
5.5.1	Cyproterone	Tablets 50mg	III - IV	E
5.5.2	Stilboestrol	Tablets 1mg	III - IV	E
5.5.3	Testosterone undecanoate	Capsules 40mg, Solution for injection (oily depot) 250mg/ml,(1ml)	III - IV	E

	Medicine	Presentation	Level	VEN
5.6	**Other endocrine medicines**			
5.6.1	Bromocriptine	Tablets 2.5mg	III - IV	E
5.6.2	Clomiphene citrate	Tablets 50mg	III - IV	E
5.6.3	Danazol	Capsules 100mg	III - IV	E
5.7	**Medicines used in obstetrics and gynaecology**			
5.7.1	**Medicines acting on smooth muscle**			
5.7.1.1	**Anticonvulsants**			
5.7.1.1.1	Magnesium sulphate	Solution for injection 50%	II - IV	E
5.7.1.2	**Prostaglandin Analogues and Oxytocics**			
5.7.1.2.1	Dinoprostone	Tablets 500mcg, Solution for injection 1mg/ml	III - IV	E
5.7.1.2.2	Ergometrine maleate	Tablets 250mcg, 500mcg, Solution for injection 200mcg/ml	II - IV	V
5.7.1.2.3	Ergometrine + Oxytocin	Solution for injection 50mcg/5 IU	II - IV	E
5.7.1.2.4	Oxytocin	Solution for injection 10 IU/ml,1ml	II - IV	V
5.7.1.2.5	Carbetocin (heat stable)	Solution for injection 100mcg/ ml	HC, I - IV	V
5.7.1.2.6	Misoprostol	Tablets 200mcg	I - IV	V
5.7.1.2.7	Mifepristone	Tablets 200mg	II - IV	V
5.7.1.2.8	Mifepristone + Misoprostol	Tablets 200mg/200mcg	II - IV	V

	Medicine	Presentation	Level	VEN
5.7.1.3	**Myometrial relaxants**			
5.7.1.3.1	Salbutamol	Solution for injection 500mcg/ml (1ml)	II - IV	V
5.7.1.3.2	Nifedipine	Immediate release capsule, 10mg	HC, I - IV	V
5.7.1.4	**Other medicines administered to the pregnant woman**			
5.7.1.5.1	Dexamethasone phosphate	Solution for injection 4mg/ ml	HC, I - III	V
5.7.1.5.2	Tranexamic acid	Tablets 500mg, Solution for injection 100mg/ ml	HC, I - III	V
5.8	**Contraceptives**			
5.8.1	**Combined oral contraceptives**			
5.8.1.1	Ethinylestradiol/levonorgestrel	Tablets 30mg/150mcg	I - IV	V
5.8.2	**Emergency contraception**			
5.8.2.1	Levonorgestrel	Tablets 750mcg,1.5mg	I - IV	V
5.8.3	**Progesterone-only oral contraceptives**			
5.8.3.1	Levonorgestrel	Tablets 30mcg	I - IV	V
5.8.4	**Progesterone-only injectable contraceptives**			
5.8.4.1	Medroxyprogesterone acetate	Suspension for injection 150mg/ml,1ml Pre-filled subcutaneous injection 104mg/ 0.65ml	I - IV	V
5.8.4.2	Norethisterone enanthate	Solution/Emulsion for injection 200mg/ml,1ml	I - IV	V
5.8.5	**Barrier methods**			
5.8.5.1	Female condoms	Artificial plastic sheath	HC, I - IV	V
5.8.5.2	Male condoms	Latex sheath with/without spermicide	HC, I - IV	V

	Medicine	Presentation	Level	VEN
5.8.5.3	Copper coil intrauterine device	Copper long coil type (Copper T 380A) Intrauterine device (IUD)	I - IV	V
5.8.5.4	Levonorgestrel-releasing intrauterine system	Intrauterine device LNG-IUS 52mg	I - IV	V
5.8.5.5	Menfegol spermicidal vaginal foaming	Forming tablets	I - IV	E
5.8.6	**Implants**			
5.8.6.1	Levonorgestrel implant	Two rods, 75 mg each	IV	V
5.8.6.2	Etonogestrel implant	Single rod- releasing implant 68 mg	IV	V
6	**Medicines used in the treatment of respiratory system disorders and allergy**			
6.1	**Anti-asthmatic medicines and medicines for chronic obstructive pulmonary disorder**			
6.1.1	Adrenaline	Solution for injection 1 in 1000, (1ml)	I - IV	V
6.1.3	Salbutamol	Tablets 2mg, Oral syrup 2mg/5ml	I - IV	V
		Inhaler 100mcg/dose, Nebuliser liquid 2mg/ml	I - IV	E
6.2	**Corticosteroids**			
6.2.1	Hydrocortisone sodium succinate	Powder for injection 100mg vial	I - IV	V
6.2.2	Prednisolone	Tablets 5mg	II - IV	V

	Medicine	Presentation	Level	VEN
6.3	**Asthma prophylaxis therapy**			
6.3.1	Beclomethasone	Inhaler 50mcg/dose	II - IV	E
6.3.2	Sodium cromoglicate	Inhaler 5mg/dose	II - IV	E
6.3.3	Ipratropium bromide	Inhaler 20mcg/ metered dose	II - IV	E
	Budesonide + Formoterol	Inhaler 100mcg + 6mcg or 200mcg + 6mcg	II - IV	E
6.4	**Antihistamines**			
6.4.1	Chlorpheniramine	Syrup, Tablets 4mg	I - IV	E
6.4.2	Promethazine	Syrup, Tablets 10mg, Solution for injection 5mg/ml	I - IV	E
6.4.3	Loratidine	Oral liquid 1mg/ml, Tablets 10mg	HC, I - IV	E
6.5	**Oxygen therapy**			
6.5.1	Oxygen	Medical gas	I - IV	V
7	**Medicines used in the treatment of cardiovascular system disorders**			
7.1	**Cardiac glycosides**			
7.1.1	Digoxin	Tablets 250mcg, Solution for injection 250mcg/ml, (2ml), Elixir 50mcg/ml	II - IV	V
7.2	**Diuretics**			
7.2.1	**Thiazides**			
7.2.1.2	Bendrofluazide	Tablets 5mg	II - IV	E

	Medicine	Presentation	Level	VEN
7.2.1.3	Hydrochlorthiazide	Tablets 50mg	II - IV	E
7.2.2	**Loop diuretics**			
7.2.2.1	Frusemide	Tablets 40mg, Solution for injection 10mg/ml, (2ml)	II - IV	V
7.2.3	**Potassium-sparing diuretics**			
7.2.3.1	Amiloride + Hydrochlorthiazide	Tablets 5mg/50mg	II - IV	E
7.2.4	**Osmotic diuretics**			
7.2.4.1	Mannitol	Solution for injection 20% (250ml bottle)	II - IV	V
7.3	**Antiarrhythmic medicines**			
7.3.1	Amiodarone	Tablets 100mg, Solution for injection	III - IV	E
7.3.2	Atenolol	Tablets 50mg	II - IV	E
7.3.3	Digoxin	Tablets 250mcg, Solution for injection 250mcg/ml (2ml)	II - IV	V
7.3.4	Lignocaine	Solution for injection 1%, (10ml, 25ml)	II - IV	V
7.3.5	Quinidine	Tablets 200mg, 300mg	IV	V

	Medicine	Presentation	Level	VEN
7.4	**Anti-angina medicines**			
7.4.1	Atenolol	Tablets 50mg	III - IV	E
7.4.2	Glyceryl trinitrate	Sub-lingual tablets 500mcg	II - IV	E
7.4.3	Isosorbide mononitrate	Tablets 10mg	II - IV	E
7.4.4	Nifedipine	Tablets or Capsules 10mg	II - IV	E
7.5	**Antihypertensive medicines**			
7.5.1	**Thiazide diuretics**			
7.5.1.1	Hydrochlorthiazide	Tablets 50mg	II - IV	E
7.5.1.2	**Potassium-sparing diuretics**			
7.5.1.2.1	Amiloride + Hydrochlorthiazide	Tablets 5mg/50mg	II - IV	E
7.5.1.2.2	Spironolactone	Tablets 25mg	II - IV	E
7.5.2	**Beta- adrenoceptor blockers**			
7.5.2.1	Atenolol	Tablets 50mg	II - IV	E
7.5.2.2	Propranolol	Tablets 10mg, 40mg	II - IV	E
7.5.2.3	Carvedilol	Tablets 3.125mg	IV	E
7.5.2.4	Labetalol	Tablets 100mg, Solution for injection 5mg/ml	III - IV	E
7.5.2.5	Metoprolol	Tablets 50mg, 100mg	III - IV	E

	Medicine	Presentation	Level	VEN
7.5.3	**Vasodilators**			
7.5.3.1	Hydralazine	Tablets 25mg, Solution for injection 20mg ampoule	II - IV	E
7.5.4	**Angiotensin-converting enzyme (ACE) inhibitors**			
7.5.4.1	Captopril	Tablets 25mg	III - IV	E
7.5.4.2	Lisinopril	Tablets 5mg, 10mg, 25mg	III - IV	E
7.5.4.3	Enalapril	Tablets 5mg, 10mg, 20mg	III - IV	E
7.5.5	**Angiotensin II receptor blockers**			
7.5.5.1	Losartan	Tablets 25mg, 50mg	IV	E
7.5.5.2	Losartan + Hydrochlorthiazide	Tablets 50mg/12.5mg	HC, I - IV	E
7.5.5.3	Telmisartan + Hydrochlorthiazide	Tablets 40mg/12.5mg	HC, I - IV	E
7.5.6	**Calcium channel blockers**			
7.5.6.1	Nifedipine	Tablets or Capsules 10mg, 20mg	III - IV	E
7.5.6.2	Verapamil	Tablets 40mg	III - IV	E
7.5.6.3	Amlodipine	Tablets 5mg, 10mg	III - IV	E
7.5.7	**Centrally acting antihypertensives**			
7.5.7.1	Methyldopa	Tablets 250mg	HC, I - IV	E

	Medicine	Presentation	Level	VEN
7.6	**Medicines used in shock - sympathomimetics**			
7.6.1	Adrenaline	Solution for injection 1 in 1000 (1mg/ml)	I - IV	V
7.7	**Alpha-adrenoceptor blocking agents**			
7.7.1	Prazosin	Tablets 500mcg, 1mg	III - IV	E
7.8	**Lipid-regulating medicines**			
7.8.1	**Statins**			
7.8.1.1	Simvastatin	Tablets 20mg, 40mg	IV	E
7.8.1.2	Atorvastatin	Tablets 20mg, 40mg	II - IV	E
7.9.1	**Inotropic medicines**			
7.9.1.1	Dopamine	Solution for injection 40mg/ml	IV	E
8	**Medicines used in the treatment of malignant diseases: Anti-neoplastic medicines**			
8.1	Actinomycin D (Dactinomycin)	Powder for injection 500mcg	III - IV	V
8.2	Asparaginase	Powder for injection 1000 IU	III - IV	V
8.3	Azathioprine	Tablets 50mg, injection 50mg vial	IV	V
8.4	Bleomycin	Powder for injection 15 000 unit ampoule	IV	V
8.5	Busulphan	Tablets 500mcg	IV	V
8.6	Calcium folinate	Tablets 15mg	IV	V
8.7	Carboplatin	Solution for injection 10mg/ml	IV	V
8.8	Carmustine	Powder for injection 100mg vial	IV	V

	Medicine	Presentation	Level	VEN
8.37	Thioguanine	Tablets 40mg	IV	V
8.38	Vinblastine	Solution for injection 1mg/ml	IV	V
8.39	Vincristine	Solution for injection 1mg, 5mg	III - IV	V
9	**Medicines acting on the eye**			
9.1	**Ophthalmic diagnosis**			
9.1.1	Fluorescein sodium	Eye drops, strips	III - IV	E
9.2	**Anti-infective preparations**			
9.2.1	**Antibacterial**			
9.2.1.1	Chloramphenicol	Eye drops 0.5%, Eye ointment 1%	II - IV	E
9.2.1.2	Chloramphenicol + Dexamethasone	Eye drops 15%/ 0.1%	III - IV	E
9.2.1.3	Tetracycline	Eye ointment 1%	I - IV	E
9.2.1.4	Oxy-tetracycline + Hydrocortisone	Eye drops 3%/ 1%	III - IV	E
9.2.1.5	Neomycin + Betamethasone	Eye drops 0.5%/ 0.1%	III - IV	E
9.2.1.6	Gentamicin	Eye drops 0.3%	II - IV	E
9.2.1.8	Ofloxacin	Solution 0.3%	III - IV	E

	Medicine	Presentation	Level	VEN
8.9	Chlorambucil	Tablets 2mg	IV	V
8.10	Cisplatin	Solution for injection 1mg/ml	IV	V
8.11	Cyclophosphamide	Tablets 50mg, Powder for injection 100mg	IV	V
8.12	Cytarabine (Cytosine arabinoside)	Powder for injection 100mg, 500mg, 1g vial	IV	V
8.13	Cyproteron acetate	Tablets 50mg, 100mg	IV	V
8.14	Dacarbazine	Powder for injection 200mg vial	IV	V
8.15	Daunorubicin	Powder for injection 20mg vial	IV	V
8.16	Doxorubicin	Powder for injection 10mg,50mg	IV	V
8.17	Etoposide	Solution for IV infusion 20mg/ml	IV	V
8.18	Fludarabine	Tablets 10mg, Solution for injection, infusion 40mg/m^2	IV	V
8.19	Filgrastim	Solution for injection 300mcg/ml	IV	V
8.20	Fluorouracil	Solution for injection 25mg/ml	IV	V
8.21	Hydroxyurea	Capsules 500mg	IV	V
8.22	Ifosfamide	Powder for injection 1g, 2g vial	IV	V
8.23	Imatinib	Tablets 100mg	IV	V
8.24	Interferon	Solution for injection 300mg	IV	V
8.25	Lomustine	Capsules 40mg	IV	V
8.26	Melphalan	Tablets 2mg, Solution for injection 100mg	IV	V
8.27	Mercaptopurine	Tablets 50mg	IV	V
8.28	Methotrexate	Tablets 2.5mg, Solution for injection 50mg	IV	V
8.29	Mitomycin	Solution for injection 40mg	IV	V
8.30	Mustine	Solution for injection 10mg	IV	V
8.31	Paclitaxel	Solution for IV infusion 6mg/ml	IV	V
8.32	Procarbazine	Capsules 50mg	IV	V
8.33	Stilboestrol (Diethylstilbestrol)	Tablets 1mg	IV	V
8.34	Tamoxifen	Tablets 20mg	IV	V

	Medicine	Presentation	Level	VEN
9.2.2	**Antifungals** **(Preparations are not generally available and could be prepared extemporaneously)**			
9.2.2.1	Povidine Iodine	Eye drops 0.5%	III - IV	E
9.2.2.2	Natamycin	Eye suspension 5%	IV	E
9.2.3	**Antiviral**			
9.2.3.1	Aciclovir	Eye ointment	III - IV	E
9.3	**Anti-inflammatory preparations**			
9.3.1	Hydrocortisone acetate	Eye drops, eye ointment	II - IV	E
9.3.2	Dexamethasone	Eye drops 0.1%	III - IV	E
9.3.4	Tropicamide	Eye drops 1%	III - IV	E
9.3.5	Sodium cromoglycate	Eye drops 2%	III - IV	E
9.4	**Miotics and anti-glaucoma medicines**			
9.4.1	Pilocarpine	Eye drops 2%, 4%	III - IV	E
9.5	**Mydriatic medicines**			
9.5.1	Atropine sulphate	Eye drops 1%	III - IV	E

	Medicine	Presentation	Level	VEN
9.6	**Systemic preparations**			
9.6.1	Acetazolamide sodium	Tablets 250mg	III - IV	V
9.7	**Local anaesthetics**			
9.7.1	Lignocaine hydrochloride	Eye drops 4%	III - IV	E
9.8	**Prostaglandin Analogue**			
9.8.1	Latanoprost	Eye drops 50mcg/ml	IV	E
9.9	**Sympathomimetics**			
9.9.1	Dipivefrine	Eye drops 0.1%	IV	E
9.10	**Beta-adrenoceptor blocker**			
9.10.1	Timolol maleate	Eye drops 0.25%, 0.5%	III - IV	E
9.11	**Diuretics**			
9.11.1	Cyclopenthiazide	Tablets 0.5mg	IV	E
9.12	**Artificial tears**			
9.12.1	Hypromellose	Eye drops 0.3mg	III - IV	E

	Medicine	Presentation	Level	VEN
9.13	**Hyperosmotic agents**			
9.13.1	Mannitol	Solution in water 20%	III - IV	E
9.13.2	Urea	Solution 30% in 10% invert sugar	III - IV	E
10	**Blood and Blood Products**			
10.1	**Anti-coagulants**			
10.1.1	Heparin (Unfractionated)	Solution for injection 5000IU/ml,1ml	II - IV	V
10.1.2	Enoxaparin	Solution for injection 100mg/ml, Pre-filled syringes	II - IV	V
10.1.3	Warfarin	Tablets 1mg, 5mg	II - IV	V
10.2	**Anti-haemorrhagic medicines**			
10.2.1	Aminocaproic acid	Effervescent powder 3g, Oral suspension 10mg/5ml	III - IV	E
10.2.2	Tranexamic acid	Solution for injection 100mg/ml, Tablets 650mg	III - IV	E
10.2.2	Fibrinogen	Dry or freeze dried powder for injection	III - IV	V
10.2.3	Human anti-haemophiliac fraction (dried)	Solution for reconstitution 3 units/ml	IV	E
10.2.4	Phytomenadione (Vitamin K)	Solution for injection 10mg/ml,(1ml)	II - IV	V
10.3	**Haematinics**			
10.3.1	Ferrous sulphate	Tablets 50mg, 200mg	HC, I - IV	V
10.3.2	Folic acid	Tablets 5mg, 400mcg	HC, I - IV	V
10.3.3	Hydroxocobalamin (Vitamin B12)	Solution for injection 1mg/ml,1ml	II - IV	E
10.3.4	Iron dextran	Solution for injection 50mg iron in 2ml ampoule	II - IV	E

	Medicine	Presentation	Level	VEN
11	**Nutrition**			
11.1	**Vitamins, minerals and dietary supplements**			
11.1.1	Ascorbic acid (vitamin C)	Tablets 50mg, 200mg	I - IV	E
11.1.2	Calcium gluconate	Solution for injection 10%, (5ml,10ml)	III - IV	E
11.1.3	Ergocalciferol (Vitamin D)	Tablets 50,000 IU, solution 3000 IU/ml	II - IV	E
11.1.4	Nicotinamide	Tablets 50mg	II - IV	E
11.1.5	Pyridoxine (Vitamin B6)	Tablets 50mg	I - IV	E
11.1.6	Retinol (Vitamin A)	Capsules/ Tablets 200,000IU	I - IV	E
11.1.7	Riboflavin (Vitamin B2)	Tablets 5mg	III - IV	E
11.1.8	Thiamine (Vitamin B1)	Tablets 50mg, Solution for injection 100mg/5ml	III - IV	E
11.2	**Electrolyte and water replacement**			
11.2.1	**Orally administered**			
11.2.1.1	Oral rehydration salts	Powder sachets 27.9g to make 1 litre	I - IV	V
11.2.1.2	Potassium chloride	Tablets slow-release 600mg	II - IV	E
11.2.2	**Infusions**			
11.2.2.1	Dextrose (glucose)	Solution 5%, 20, 50%	I - IV	V
11.2.2.2	Potassium chloride	Solution 11.2%	II - IV	E
11.2.2.3	Sodium bicarbonate	Solution 4.2%	III - IV	V
11.2.2.4	Sodium chloride (normal saline)	Solution 0.9%	I - IV	V
11.2.2.5	Sodium lactate and glucose (Darrow's)	Solution, full and half strength	I - IV	V

	Medicine	Presentation	Level	VEN
12.4	**Topical anti-bacterial preparations**			
12.4.1	Mupirocin	Cream, Ointment 2%	I - IV	E
12.4.2	Silver sulfadiazine	Cream 1%	I - IV	E
12.5	**Antiseptic preparations**			
12.5.1	Potassium permanganate	Topical solution 1:10,000	I - IV	E
12.6	**Topical anti-parasitic preparations**			
12.6.1	Benzyl benzoate	Lotion 25%	I - IV	E
12.6.2	Malathion	Lotion 0.5%	I - IV	E
12.6.3	Permethrin	Cream 1%	I - IV	E
12.7	**Keratoplastics and keratolytics**			
12.7.1	Coal tar	Solution 5%	I - IV	E
12.7.2	Dithranol	Ointment 1%	III - IV	E
12.7.3	Podophylline	Paint 15% in compound benzoin tincture	II - IV	E
12.7.4	Salicylic acid	Ointment 5%, 10%, 20%	I - IV	E
12.8	**Acne preparations**			
12.8.1	Salicylic acid	Lotion	I - IV	E
12.8.2	Benzyl peroxide	Lotion	I - IV	E

	Medicine	Presentation	Level	VEN
11.2.2.6	Sodium lactate compound (Ringers lactate)	Solution	I - IV	V
11.2.2.7	Water for injection	Solution 2ml, 5ml, 10ml	I - IV	V
11.2.3	**Plasma substitutes**			
11.2.3.1	Dextran 40, 70	Solution for injection 10%, 6%	III - IV	V
11.2.3.2	Gelatin (as polygeline)	Solution for injection 3.5	III - IV	E
12	**Medicines acting on the skin**			
12.1	**Topical corticosteroids**			
12.1.1	Betamethasone	Cream/ Ointment 0.1%	III - IV	E
12.1.2	Hydrocortisone	Cream/ Ointment 1%	I - IV	E
12.2	**Soothing preparations**			
12.2.2	Calamine	Lotion	I - IV	E
12.3	**Topical antifungal preparations**			
12.3.1	Miconazole nitrate	Cream 2%	III - IV	E
12.3.2	Ketoconazole	Cream	I - IV	E
12.3.3	Griseofulvin	Tablets 250mg, 500mg	II - IV	E

	Medicine	Presentation	Level	VEN
12.9	**Surgical disinfectants**			
12.9.1	Sodium hypochlorite	Solution 0.1% available chlorine	I - IV	V
12.9.2	Chloroxylenol	Concentrated solution 4.8%	I - IV	E
12.10	**Antiseptics**			
12.10.1	Cetrimide	Solution 1%	I - IV	E
12.10.3	Chlorhexidine gluconate	Concentrated solution 5%	I - IV	E
12.10.2	Chlorhexidine + Cetrimide	Concentrated solution (1.5%/ 15%)	I - IV	E
12.10.4	Povidone iodine	Solution 10%	I - IV	V
12.11	**Topical antivirals**			
12.11.1	Acyclovir	Cream 5%, Tablets 200mg	II - IV	E
13	**Medicines used in the treatment of diseases of the ear, nose and throat**			
13.1	**Medicines acting on the ear**			
13.1.1	Betamethasone	Ear drops	III - IV	E
13.1.2	Gentamicin + Hydrocortisone	Ear drops	II - IV	E

	Medicine	Presentation	Level	VEN
13.1.3	Sodium bicarbonate	Ear drops	III - IV	E
13.1.4	Olive oil (Vegetable oil)	Ear drops	I - IV	E
13.1.5	Acetic acid	Solution 2%	I - IV	E
13.2	**Medicines acting on the nose: topical nasal decongestants**			
13.2.1	Saline	Nasal drops	II - IV	E
13.2.2	Xylometazoline	Nasal drops 0.25%, 0.05%	I - IV	E
13.3	**Medicines acting on the throat**			
13.3.1	Chlorhexidine	Mouth wash 0.2%	I - IV	E
13.3.2	Miconazole	Oral gel	I - IV	E
13.3.3	Nystatin	Oral suspension	I - IV	E
14	**Medicines used for the treatment of musculoskeletal disorders**			
14.1	**Medicines used for rheumatic diseases**			
14.1.1	Acetyl salicylic acid	Tablets 300mg	I - IV	V
14.1.2	Ibuprofen	Tablets 200mg	I - IV	E
14.1.3	Hydroxychloroquine	Tablets 200mg	III - IV	E

	Medicine	Presentation	Level	VEN
15.2.8	Tetanus toxoid (TT)	Injection	I - IV	V
15.2.9	Typhoid	Injection	III - IV	E
15.2.10	Yellow fever	Injection	III - IV	E
15.2.11	Human Papilloma Virus (HPV)	Injection	III - IV	E
15.2.12	Rota Virus	Injection	III - IV	E
15.2.13	Pneumococcal Conjugate Vaccine 13	Injection	III - IV	E
15.2.14	Cholera	Injection	III - IV	E
16	**Antidotes and other substances used in poisoning**			
16.1	**General treatment of poisoning**			
16.1.1	Activated charcoal	Powder	I - IV	V
16.1.2	Ipecacuanha	Syrup 0.14% ipecacuanha alkaloids	I - IV	V
16.2	**Specific treatment of poisoning**			
16.2.1	Atropine	Injection 1mg/ml, (1ml)	III - IV	V
16.2.2	Naloxone	Injection 400mcg/ml	III - IV	V
16.2.3	Pralidoxine mesylate	Injection 200mg/ml, (5ml)	III - IV	V
16.2.4	Glycopyrronium bromide	Injection 500mcg/ml	III - IV	V
16.2.5	N-acetylcysteine	Solution 20%	IV	E
16.2.6	Protamine sulphate	Injection 10mg/ml	IV	E

ESSENTIAL LABORATORY SUPPLIES LIST

TEST	REAGENT	UNIT PACK
CD4 estimation	BD FACSCalibur	
	BD Tritest CD3/CD4/CD45 with TruCount Tubes	Kit of 50 tests
	BD Calibrate 3 Beads	Kit of 25 tests
	BD FACS Lysing Solution	100 ml
	True Count Control	Kit of 30 test
	BD FACSCount	
	BD FACS Count CD4/CD8 Reagents	Kit of 50 tests
	BD FACS Count Controls	Kit of 25 tests
	BD FACS Rinse Solution	5 L
	BD FACS Clean Solution	5 L
	BD FACS Flow Sheath Fluid	20 L
	BD FACSCount Thermal Paper	Roll
	Guava	
	Guava Auto CD4/CD4 % reagent kit	100 tests
	Guava easy CD4 microcentrifuge tube	500 x 1.5 ml
	Guava check kit	50 tests
	Guava cleaning fluid	100 ml

Full Blood count	Sysmex PocH 100i	
	Eight Check-H	1.5 ml
	Eight Check-N	1.5 ml
	Eight Check-L	1.5 mL
	PocH pack 65	Pack of 2.7L pack D and 50ml pack L
	Sysmex Clean	50ml
	Sysmex Thermal Paper	Roll
	ABX Micros 60/80	
	ABX Minotrol 16 Twin Pack Low	2 x 2.5 ML
	ABX Minotrol 16 Twin Pack Normal	2 x 2.5 ML
	ABX Minotrol 16 Twin Pack High	2 x 2.5 ML
	ABX Miniclean	1 L
	ABX Minilyse	1 L
	ABX Minidil	20 L
	ABX Pentra 60C+/80XL	
	ABX Difftrol Twin Pack Low	2 x 3ML
	ABX Difftrol Twin Pack Normal	2 x 3ML
	ABX Difftrol Twin Pack High	2 x 3ML
	ABX Lysebio	400 ml
	ABX Basolyse	1 L
	ABX Cleaner	1 L

Full Blood count	ABX Diluent	20 L
	ABX Eosinofix	1 L
	Sysmex XS 800i/XS1800i/XT 2000i	
	Sysmex control e-Check Low	8 x 4.5ML
	eCheck Sysmex control e-Check Normal	8 x 4.5ML
	Sysmex control e-Check High	8 x 4.5ML
	Sysmex Cell pack	20L
	Sysmex Stromatolyser 4DL	5L
	Sysmex Stromatolyser 4DS	3 x 42 ML
	Sysmex Sulfolyser	5L
	Sysmex Cell clean	50ML
	Sysmex Retsearch Diluent/Dye	1L
	Sysmex Stromatolyser FB	5L

Clotting profile	Coagulation	
	Activated Partial thromboplastin time (APTT) test kit	each
	Prothrombin Time (PT) test kit	each
	Thrombin Time (TT) test	each
	CaCl 0.025mmol/L	10 ml
	Factor VIII deficient plasma	vial
	Factor IX deficient plasma	vial
	Fibrin degradation products	kit

Peripheral smear	HAEMATEK slide stainer	
	Blood film stain pack	pack
	Bone marrow stain pack	pack
Special Stains	Cytochemistry	
	Glucose 6 phosphate dehydrogenase (G6PD)	kit
	Sudan black B stain	kit
	Myeloperoxidase	kit
	Antinuclear antibody test by indirect method	kit

Clotting profile	Coagulation	
	Activated Partial thromboplastin time (APTT) test kit	each
	Prothrombin Time (PT) test kit	each
	Thrombin Time (TT) test	each
	CaCl 0.025mmol/L	10 ml
	Factor VIII deficient plasma	vial
	Factor IX deficient plasma	vial
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Peripheral smear	HAEMATEK slide stainer	
	Blood film stain pack	pack
	Bone marrow stain pack	pack

Special Stains	Cytochemistry	
	Glucose 6 phosphate dehydrogenase (G6PD)	kit
	Sudan black B stain	kit
	Myeloperoxidase	kit
	Antinuclear antibody test by indirect method	kit

Clinical chemistry	Cobas Integra 400	
	Cobas ALT/ GPT	500 test cassette
	Cobas AST/ GOT	500 test cassette
	Cobas Creatinine	700 test cassette
	Cobas Urea	500 test cassette
	Cobas Cholesterol	400 test cassette
	Cobas Glucose	800 test cassette
	Cobas Triglycerides	250 test cassette
	Cobas Bilirubin Total	500 test cassette
	Cobas Bilirubin Direct	500 test cassette
	Cobas Total Protein	400 test cassette
	Cobas Albumin	300 test cassette
	Cobas Cfas	36 ml
	Cobas Precinorm U	4 X 5 ml
	Cobas Precipath U	4 X 5 ml
	Cobas Deproteinizer	23 ml

Clinical chemistry	Cobas Amylase	300 test cassette
	Cobas Lipase	200 test cassette
	Cobas Lactate	300 test cassette
	Cobas Cuvettes	Pack of 2000 cuvettes
	Cobas Sample cups (white)	Pack of 1000 cups
	Cobas Control cups (brown)	Pack of 1000 cups
	Cobas Waste container	Each
	Cobas Cleaner	1 L
	Cobas c 111	
	Cobas ALT/ GPT	4 x 100 test
	Cobas AST/ GOT	4 x 100 test
	Cobas Creatinine	2 x 200 test
	Cobas ALP	4 x 50 test
	Cobas Urea	4 x 100 test
	Cobas Cholesterol	4 x 100 test
	Cobas Glucose	4 x 100 test
	Cobas Triglycerides	4 x 50 test
	Cobas Bilirubin Total	4 x 100 test
	Cobas Bilirubin Direct	4 x 50 test
	Cobas Total Protein	4 x 100 test
	Cobas Albumin	4 x 100 test

Clinical chemistry	Cobas Bicabonate	4 x 100 test
	Cobas HbA1C	400 test
	Cobas LDH	4 X 50 tests
	Cobas Uric	4 x 100 tests
	Cobas Amylase	4 x 100 tests
	Cobas Lipase	4 x 50 tests
	Cobas Lactate	4 x 50 tests
	Cobas Cuvettes	Pack of 2000 cuvettes
	Cobas Sample cups (white)	Pack of 1000 cups
	Cobas Control cups (brown)	Pack of 1000 cups
	Cobas Waste container	Each
	Cobas Cleaner	1 L
	Humalyzer 2000	
	Human ALT(GPT) Liquicolor UV	10 X 10 ml
	Human AST(GOT) Liquicolor UV	10 X 10 ml
	Human Creatinine Liquicolor	200 ml
	Human Glucose Liquicolor	1 L
	Human Urea Liquicolor	2 X 100 ml
	Human Bilirubin Direct	100 ml
	Human Bilirubin Total	100 ml
	Humatrol Normal (N19)	6 X 5 ml

Clinical chemistry	Humatrol Pathological (P17)	6 X 5 ml
	Humalyzer 2000 Thermal Printing Paper	Roll
	Humalyzer 2000 Cuvettes	Pack of 1000
	Humalyte	
	Na	ISE
	Cl	ISE
	K	ISE
	Olympus AU400	
	Olympus ALT	4x12, 4x6 ml
	Olympus AST	4x6, 4x4 ml
	Olympus Cholesterol	4 X 22.5 ml
	Olympus Cholesterol HDL	4 X 22.5 ml
	Olympus Bilirubin Direct	4 X 25 ml / 4 X 25 ml
	Olympus Bilirubin Total	2 X 100 ml
	Olympus Electrode Na+	Each
	Olympus Electrode K+	Each
	Olympus Electrode Cl	Each
	Olympus ISE Buffer	1 L
	Olympus Mid ISE Standard	2 L
	Olympus Electrode Cleaning Solution	2 X 50 ml
	Olympus Control Serum 1	20 X 5 ml

Clinical chemistry	Olympus Control Serum 2	20 X 5 ml
	Olympus Creatinine	4 X 60 ml
	Olympus Glucose	4x25 ml/ 4x12.5 ml
	Olympus System Calibrator	20 X 5 ml
	Olympus Triglyceride	4x50 ml/ 4x12.5 ml
	Olympus Urea	2x4x25 ml
	Olympus Wash Solution	5 L
	Olympus Total Protein	500 test cassette
	Olympus Albumin	500 test cassette
	Olympus Amylase	?
	Olympus Lipase	?
	Olympus Lactate	?
	Pentra 200/400	
	Alanine Aminotransferase (ALT/GPT)	1*70ml
	AST (Cobas III)	1*90ml
	Creatinine	1*90ml
	Urea	1*90ml
	Cholesterol	1*90ml
	Glucose	1*90ml
	Total Protein	1*90ml
	Bilirubin Total	1*90ml

Clinical chemistry	Cuvette Segements Rack	1*90ml
	Control Pathological	1*90ml
	Control Normal	1*90ml
	Amylase	1*90ml
	Lipase	1*90ml
	Lactate	1*90ml
	Deproteinizer	1*30ml
	Standard 1	100ml
	Standard 2	100ml
	Reference	100ml

HIV Viral load and qualitative tests	Cobas Taqman 48 analyser	
	CAP/CTM HIV - version 2.0	
	COBAS TaqMan K Tubes	
	CAP - G Wash Buffer	
	CAP SPU Flapless	
	CAP S Tubes (input)	
	CAP K tips	
	DNA PCR - Pediatric	
	DNA, PCR AMPLICOR HIV-/ Monitor Test	Kit of 96 tests
	PCR Consumables Kits, for 960 Tests	Kit for 960 tests
	DBS Bundles for 50 tests	Bundles for 50 tests

Bacteriology	Acetone	L
	Ammonium Oxalate	g
	Bacitracin 0.04units	250 discs
	Basic Fuchsin Powder	g
	Blood Culture Media Adult	Bottle
	Blood Culture Media Pediatric	Bottle
	Blood Agar Base	g
	MacConkey agar with crystal violet	
	Campylobacter Karmali Agar	g
	Bacitracin 0.04units	250 discs
	Basic Fuchsin Powder	g
	Cary Blair	g
	Simmon Citrate Agar	g
	Crystal Violet Powder	g
	Cystine Lactose Electrolytes Deficient Agar (CLED medium)	g
	Mueller Hinton Agar	g
	N,N,N,N Tetramethyl-P-Phenylene Diamine (Oxidase Reagent)	g
	Orange G 6 Solution	L

Glucose test	Accucheck active Glucometer Strips	Strips
Hepatitis tests	Hepatitis B Test Kit	Strips
	Hepatitis C Test kit	strips

Histopathology	Ethanol Absolute (99.9%)	L
	Methanol Absolute	L
	Formalin	L
General laboratory use	Hydrochloric Acid	L
	Kovacs Reagent	ml
Syphilis	RPR (syphilis reagent kit)	Tests
Meningitis investigation	Cryptococcus Antigen Test Kit	Tests
Pregnancy	Pregnancy Test Kit (Latex)	Tests
Stool Microscopy culture and identification	Salmonella Typhi Hd antisera	2ml
	Salmonella Typhi Vi antisera	2ml
	Salmonella Typhi O-9 antisera	2ml
	Salmonella Paratyphi A antisera	5 ml
	Salmonella Paratyphi B antisera	5 ml
	Salmonella Paratyphi C antisera	5 ml
	Salmonella Polyvalent H Phase 1 and 2 Antisera	5 ml
	Salmonella Polyvalent O groups A - S Antisera	5 ml
	Selenite F Broth	g
	Shigella boydii types 1 - 6	5 ml
	Shigella boydii types 12 - 15	

Stool Microscopy culture and identification	Shigella boydii types 7 - 11	
	Shigella disenteriae type 1 -10 antisera	5 ml
	Shigella disenteriae type 1 antisera	
	Shigella flexneri types 1-6, x,y Antisera	5 ml
	Shigella sonnei Phase 1 and 2 antisera	5 ml

General laboratory use	Sodium Chloride (Analar grade)	g
Bacteriology (MCS)	Sulphide Indole Motility (SIM) medium	g
	Triple Sugar Iron Agar (TSI)	g
	Urea Agar	g
	Urea (analar grade)	g
Urinalysis	Urine Multistix	Pack of 100 Strips

Bacteriology (MCS)	Deoxycholate citrate agar (DCA) agar	g
	Ampicillin 10 µg	250 discs
	Cefotaxime 30µg	250 discs
	Chloramphenicol 30 µg	250 discs
	Ciprofloxacin 5 µg	250 discs
	Cotrimoxazole 25 µg	250 discs
	Erythromycin 15 µg	250 discs
	Gentamicin 10 µg	250 discs
	Nalidixic Acid 30 µg	250 discs

Bacteriology (MCS)	Nitrofurantoin 300 µg	250 discs
	Penicillin 10 units	250 discs
	Oxacillin 1 µg	250 discs
	Norfloxacin 10 µg	250 discs
Histopathology	Chloroform	L
	Haematoxylin (Harris Alum Haematoxyllin)	ml
	DPX Mountant	ml
	EA 50	ml
	Acetic acid	
Malaria	Giemsa powder	g
	Glycerol	5L
	Aesculine-bile agar	
	Peptone water	
	Lysine Iron agar	
	Sabourauds agar	
	Thiosulphate citrate bile-salt sucrose (TCBS) medium	
	Tryptone soy broth	
	0.5 McFarland standard (Latex)	
	Amyl alcohol	
	Chlamydia test kit	

Malaria	Coagulase test (Commercially prepared kit e.g. StaphAurex kit or equivalent)	
	diSodium hydrogen phosphate (Na2HPO4) Anhydrous	
	Eosin powder	
General laboratory use	Hydrogen peroxide	
	Iodine	
	Methylene blue	
	Nigrosin	
	p-dimethylamino benzaldehyde powder	
	Phenol crystals	
	Potassium hydroxide	
	Potassium iodide	
	Potassium permanganate	
	Sodium biselenite powder	
	Sodium hydroxide crystals	
	Sodium dihydrogen phosphate (NaH2PO4.2H2O) hydrated	
Bacteriology (MCS)	Streptococcus Lancefield typing kit (e.g. Streptex kit or equivalent)	
General Laboratory use	Sulphuric acid	
Special stains	Toluidine blue O stain	

Toxoplasmosis	Toxoplasma antigen detection test	
General	Xylene	
	Formic Acid	
Bacteriology (MCS)	Cefoxitin 30 µg (Disc)	
	Ceftazidime30 µg (Disc)	
	Ceftriaxone 30 µg (Disc)	
	Colistin 10 µg (Disc)	
	Polymyxin B 300 Units (Disc)	
	E-test strips	
	Cefotaxime (E-test)	
	Penicillin (E-test)	
	Diagnostic discs	
	Colistin 10 µg (Disc)	
	Furazolidone 100 µg (Disc)	
	Indole test discs	
	Nitrocefin discs	
	Novobiocin 5 µg (Disc)	
	Optochin disc	
	Polymyxin B 300 units (Disc)	
	Pyrrolidonyl arylamidase test (PYR) discs	
	V factor (Disc)	

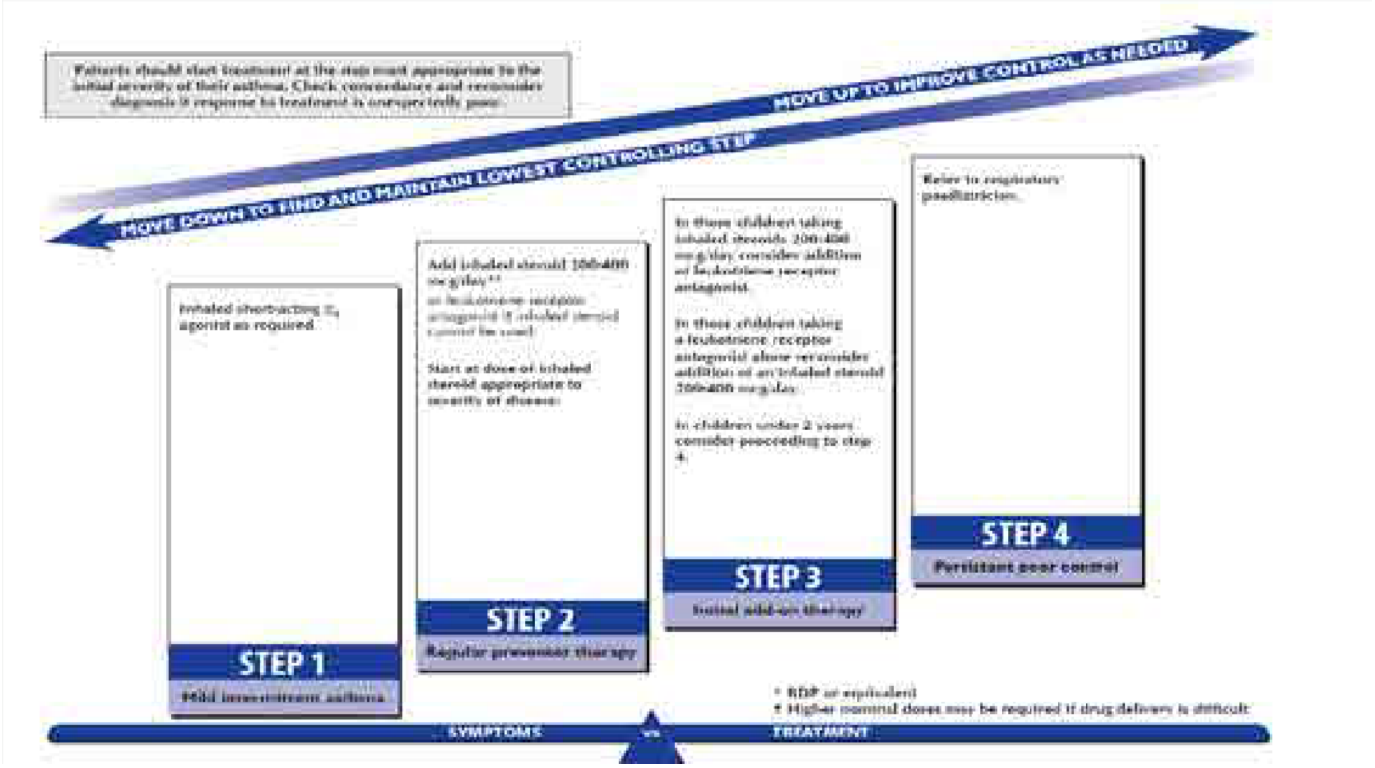
Bacteriology (MCS)	X factor (Disc)	
	XV factor (Disc)	
Bacteriology (MCS)	Antisera	
	Vibrio cholerae O1 polyvalent antisera	
	Vibrio cholerae O139 antisera	
	Vibrio cholerae Inaba antisera	
	Vibrio cholerae Ogawa antisera	
	E.coli O 157:H7 antisera	
	Clavulanic Acid Powder	
	Streptococcus pyogenes group A Rapid test strips	
	Streptococcus agalactiae group B Latex agglutination antigen detection kit	
	Gonorrhoea Rapid test strips	
Endocrinology	Thyroid Hormones	
	TSH	
	T3	
	T4	
Cancer	Tumour Markers	
	CEA	
	PSA	
	AFP	

Heart/cardiac	Cardiac Markers	
	CK MB	
	CKNAC	
	Troponin T	
	Troponin I	
General laboratory use	General Consumables	
	Applicator Sticks, Orange	Pack of 1000 sticks
	Cotton Wool	g
	Filter Paper, Medium	Pack of 100 pieces
	Filter Paper, Large	Pack of 100 pieces
	Examination Gloves, Medium	Pack of 100 gloves
	Examination Gloves, Large	Pack of 100 gloves
	Sodium Hypochlorite (Jik)	Bottle (750mls)
	Lancets	Pack of 100
	Kimwipes	Pack of 140
	Lens Tissue	Book of 25 pieces
	Microcapillary Tubes, Non-Heparinized	Pack of 100 tubes
	Microcapillary Tubes, Heparinized	Pack of 100 tubes
	Microscope Cover Slips 22 X 22mm	Pack of 100 slips
	Microscope Cover Slips 22 X 40mm	Pack of 10 boxes
	Microscope Slides	Pack of 50

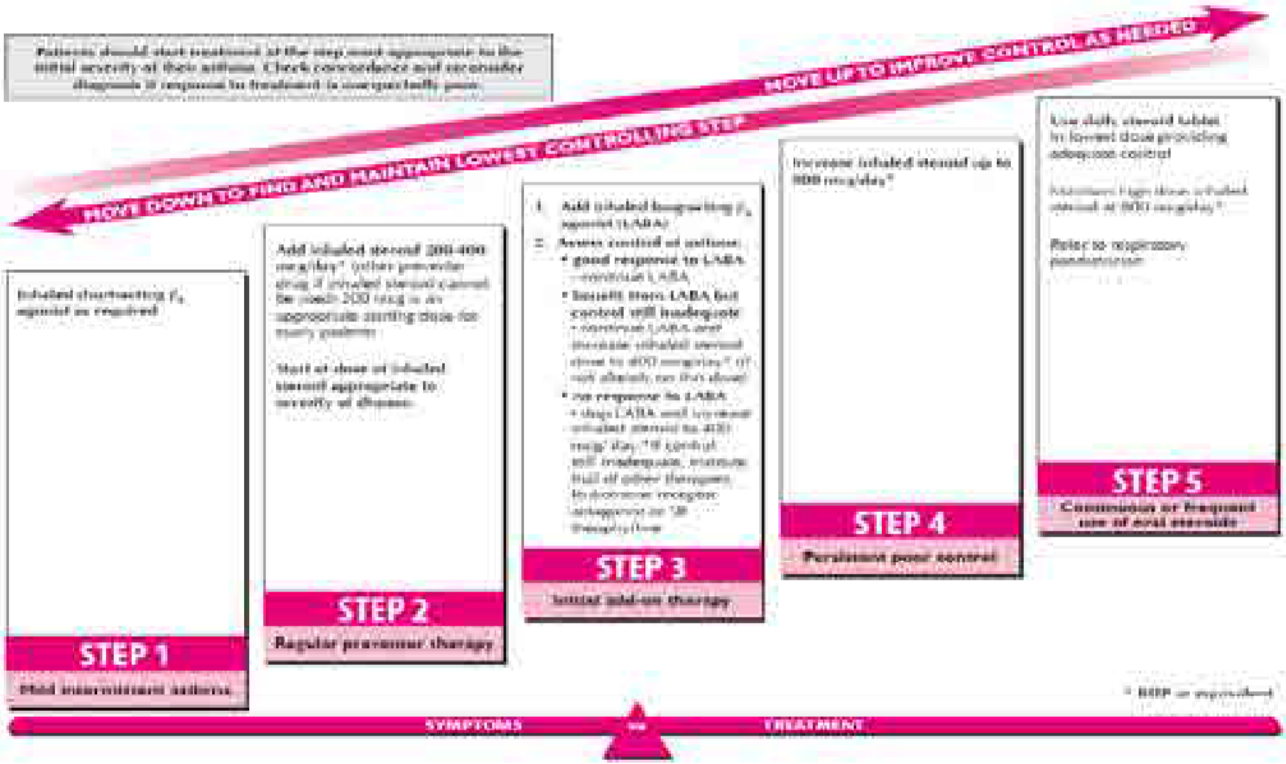
General laboratoru use	CD4 Stabilization tubes	pack of 100
	Microtube, 2 ml Screw Cap	Pack of 500
	Plastic transfer Pasteur Pipettes, 3 ml	Pack of 500
	Petri Dish, Plastic	Box of 500
	Pipette Tips, Blue	Pack of 500
	Pipette Tips, Yellow	Pack of 1000
	Spirit, Methylated	2.5 L
	Sputum Containers	Pack of 1000
	Sterile Swab	Pack of 1000
	Swabs (sterile cotton swabs with activated charcoal in Amies transport medium)	Pack of 1000
	Stool Containers, 28 ml, Screw Cap, with Scoop	Pack of 1000
Blood collection	Universal Container, 20 ml Screw Cap	Pack of 200
	Vacutainer, 4ml, Plain Red Top	Pack of 100
	Vacutainer Needle, 21G X 1	Pack of 100
	Vacutainer, 4 ml, EDTA	Pack of 100
	Vacutainer, Flouride Oxalate	Pack of 100
	Vacutainer, L.Heparin	Pack of 100
	Vacutainer Holders	Pack of 250

General laboratory use	Disposable Biohazard Bags	Pack of 100
	Autoclavable Bags	Pack of 100
Histopathology	Histopathology Cassettes	Pack of 100
	Histopathology Paraffin wax	25Kg
Haemoglobin	Haemacue cuvettes	Pack of 100

Children Less than



Children age 5-12



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