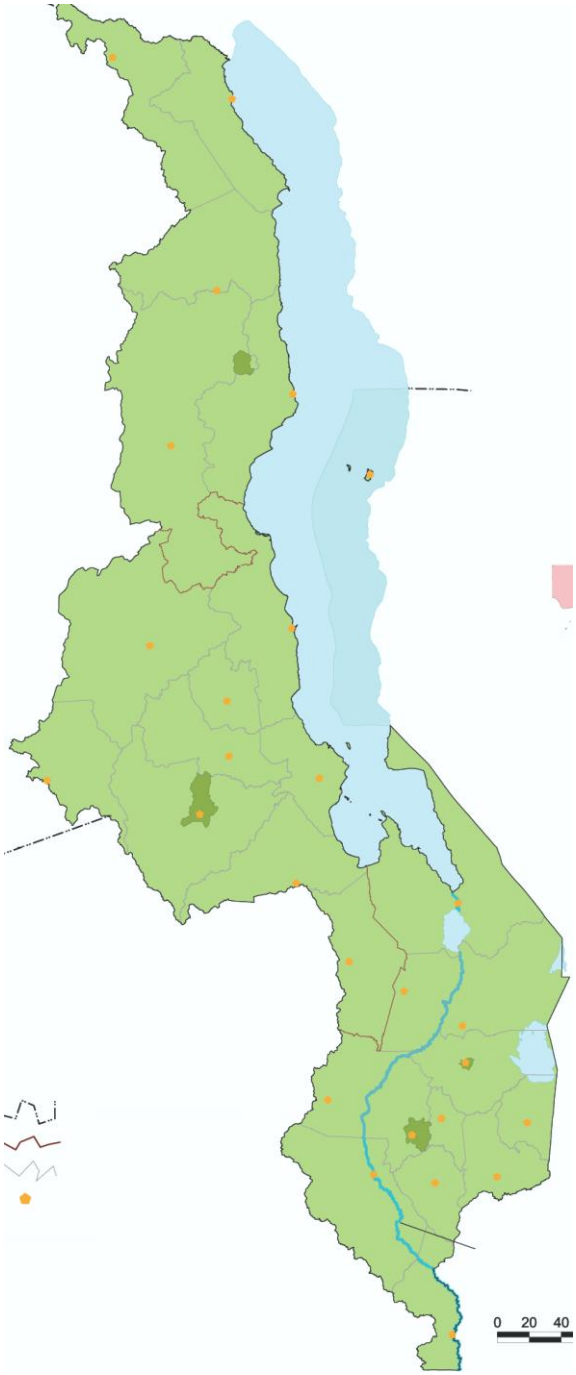
Government of Malawi



MALAWI STANDARD TREATMENT GUIDELINES (MSTG) 4th EDITION 2009

Incorporating MALAWI ESSENTIAL MEDICINES LIST (MEML) 2009

Ministry of Health

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Foreword

Medicine is a dynamic science and therefore it is important that publications such as the Malawi Standard Treatment Guidelines (MSTG) be revised at short intervals. Revision of the **3rd** edition of the MSTG started with a consultative meeting of stakeholders followed by editorial meetings and finally the approval process by members of the National Medicines and Medical Supplies Committee.

The MSTG includes key information on the selection, prescribing, dispensing and administration of medicines. It is designed as a digest for rapid reference and it may not always include all the information necessary for prescribing and dispensing. It should therefore be interpreted in the light of professional knowledge and supplemented as necessary by specialised publication and by reference to product literature.

Pursuant to the African Union Assembly Abuja Declaration of 2005, Malawi like other member states of the Union aims at putting 15% of the National budget towards towards the health budget. Resources, particularly financial resources for health service delivery are often scarce. Prudent use of these resources through improved diagnosis, rational prescribing, dispensing and use of medicines is paramount. The MSTG aims at standardizing prescribing and dispensing practices.

The 4th edition MSTG provides prescribers and dispensers with the currently recommended treatment as well as preventative schedules for most common disease states found in the country.

I would like to thank all those who took time to review the previous edition. Your contributions are greatly appreciated.

I look forward to your continued support and contributions to future reviews of the MSTG and other relevant publications.

C.V. Kang'ombe
SECRETARY FOR HEALTH

References

The following are national guidelines or reference text which should be consulted for further information on specific areas or topics:

- *Malawi National Medicine List,* MOHP, 2008
- *Malawi Prescribers Companion*, MOHP, 1993
- *A Paediatric Handbook for Malaw*i, J A Phillips, P N Kazembe, EAS Nelson, JAF Fisher, E Grabosch, 2nd ed. 1998)
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- *Management of Sexually Transmitted Infections Using Syndromic Management Approach, Guidelines for Service Delivery 2nd Edition, Ministry of Health/NAC, Vol 3, 2004 Malawi*;
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- *Manual of the National TB Control Programme in Malawi,* MOHP, 1997
- *Infection Prevention Standards*, MoH, 2006
- *Guide for the Management of Malaria,* MoH National Malaria Control Programme, 2007
- *A Mental Health Handbook for Malawi*, M Wilkinson, 1991
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- *Cervical Cancer Service Delivery Guidelines*, MoH/JHPIEGO, 2005
- *Recommended Guidelines for the practice of safe blood transfusion in Malawi*, National blood Transfusion Service/MOHP NACP, 1997
- *Protocols for the Management of Common Obstetrical Problems*, MoH Safe Motherhood Initiative Taskforce, 1998
- *Malawi National Reproductive Health Service Delivery Guidelines*, MoH Reproductive Health Unit, 2007
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- *Prevention of Mother to Child Transmission of HIV*, Handbook for Health workers, MoH, 2003
- MoH *Management of HIV/AIDS Related Diseases (2008 2nd Edition)*
- MOH *Guide for Pre- and Post-test Counselling and AIDS Counselling information.*

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Acknowledgements

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The NMMC is particularly grateful to the cooperating partners WHO and USAID funded Management Sciences for Health Strengthening Pharmaceutical Systems Program (MSH/SPS) for the financial and technical support provided during the review process.

Prescribing Guidelines

1. General points

Consider each of the following general points before writing a prescription:

1.1 Not all patients need a prescription for medicines. Non-medicine treatments and/or giving of simple advice may be more suitable in certain situations.

1.2 Good therapeutics depends on:

- Accurate diagnosis, based on thorough history-taking, necessary careful physical examination and, if required, supporting laboratory testing
- Knowledge of the medicines available
- Careful selection of the appropriate medicines
- Prescribing correctly the selected medicines and
- Ensuring that the patient understands *fully* how to use each prescribed medicine properly.

1.3 **Try to resist patient demand to prescribe injections or other expensive dosage forms. E.g. capsules and oral liquids**. Always make an effort to explain to the patient that these may not represent the best form of treatment for the particular condition

1.4 In life threatening conditions, always prescribe the *most effective* medicine available irrespective of the cost or limited availability

1.5 In order to avoid possible confusion, *always* prescribe medicines by their generic name and not by the brand name e.g. diazepam (not Valium), paracetamol (not Panado) or abbreviations i.e. PCM

1.6 Avoid prescribing combination medicines unless they have a known significant therapeutic advantage over single ingredient preparations

1.7 When prescribing any medicine, always take into consideration factors such as:

- Patient's age
- Patient's sex
- Patient's weight
- The effect of other diseases present
- Pregnancy
- Breast-feeding
- The likely degree of patient compliance with treatment

1.8 In all cases the likely benefit of any prescribed medication/s must be weighed against potential risks

1.9 Avoid overuse of symptomatic treatments for minor self-limiting conditions

1.10 Avoid multiple prescribing (polypharmacy), especially when the diagnosis is not clear

2. Prescribing of placebos

2.1 Avoid this whenever possible. Instead spend time reassuring and educating the patient

2.2 If it is *absolutely necessary* to prescribe a placebo, always choose a safe, cheap medicine which is not essential for the treatment of other important conditions, e.g. multivitamin tablets or vitamin B compound tablets

2.3 **Never** prescribe injections as placebo

2.4 Never prescribe tranquilizers e.g. diazepam, phenobarbitone, as placebos

3. Prescription writing

Note: Whenever possible, return all incomplete, inaccurate, illegible or unclear prescriptions to the prescriber for clarification, completion, or correction, before they are presented for dispensing

3.1 Write all prescriptions legibly in ink. Poor writing may lead to errors in interpretation by the dispenser which may have harmful and possibly disastrous consequences for the patient

3.2 Write the full name and address of the patient, and sign and date the prescription form

3.3 Write the name of the medicine or preparation using its full generic name. Do not use unofficial abbreviations, trade names, or obsolete names as these may cause confusion

3.4 Always state the strength of the preparation required where relevant

3.5 For solid dosage forms:

- quantities of one gram or more should be written as 1g, 2.5g, 10g, etc
- quantities of less than one gram but more than one milligram should be written as milligrams rather than fractions of a gram, e.g. 500mg and not 0.5g

3.6 Quantities less than one milligram should be expressed as micrograms (in full) and not as fractions of a milligram, e.g. 100 micrograms rather than 0.1 mg or 100mcg.

3.7 If decimals are used, always write a zero in front of the decimal point where there is no other figure, e.g. 0.5mL and not .5mL

3.8 Always state the full dose regimen, i.e.

- dose size
- dose frequency
- duration of treatment

The quantity to be dispersed will be deduced from this.

3.9 Avoid use of the direction "to be used/taken as required". Instead state a suitable dose frequency. In the few cases where 'as required' is appropriate, the actual quantity to be supplied should be stated

3.10 Avoid using unknown abbreviations. The following abbreviations can be used when writing a prescription:

Abbreviation	**Meaning**
b.i.d. or b.d.	twice a day
prn	occasionally
q4h	every 4 hours
q6h	every 6 hours
q8h	every 8 hours
q.i.d or q.d.	4 times a day
t.i.d. or t.d.	3 times a day
o.m.	every morning
o.n.	every night
nocte	at night
mane	in the morning
n et m or n.m.	night and morning

p.o.	by mouth
a.c	before meal
p.c.	after meals
stat	immediately or at once
sig	label

3.11 For oral liquids, doses should be stated in terms of 5mL spoonfuls for linctuses, elixirs, syrups and paediatric preparations, and in 10mL spoonfuls for adult mixtures

3.12 Doses other than 5mL or 10mL or multiples of these will be diluted to the nearest equivalent 5mL or 10mL quantity for dispensing

3.13 Total volumes of liquid preparations prescribed are usually selected from 50, 100, 300 or 500mL volumes

3.14 Total quantities of solid or semi-solid preparations prescribed are usually selected from 25, 50, 100, 200, 300, or 500g except where the product is supplied ready packed in a particular pack size, e.g. tetracycline eye ointment (3.5g)

3.15 Where relevant, always remember to include on the prescription any special instructions necessary for the correct use of a medicine or preparation, e.g. “before food” etc.

4. In-patient prescriptions

4.1 Write these prescriptions and records of dispensing and administration on in-patient treatment cards

4.2 Only use one card per patient at any one time

4.3 Clearly state a suitable dose frequency, or time of administration on medicines to be given ‘as required’

4.4 Always state the route of administration for all medicines prescribed

4.5 When any changes or cancellations are made to a prescription card, or if treatment is to be stopped, clearly sign and date the card in the appropriate place

4.6 If the timing of a medicine dosage is critical, ensure that suitable arrangements are made for the medicine to be given at the specific time/s required

5. Guide to quantities to be supplied

5.1 ***Oral liquids***

Adult mixtures (10 mL dose)

200mL (20 doses)

300mL (30 doses)

Elixirs, linctuses and paediatric mixtures (5mL dose)

50mL (10 doses)

100mL (20 doses)

150 mL (30 doses)

5.2 ***Preparations used in body cavities***

E.g. ear drops, nasal drops

5.3 ***External preparations***

Part of body	Semi-solid (g)*	Liquids (mL)**
Face	5-15	100
Groin and genitalia	15-25	100
Both hands	25-50	200
Scalp	50-100	200
Both arms and legs	100-200	200
Whole body	200	500

* E.g. creams, pastes, ointments etc

**e.g. lotions, applications, topical solutions, etc (for paints normally 10-25mL is supplied)

6. Prescriptions for controlled medicines

6.1 These medicines are controlled by the Laws of Malawi, The Pharmacy Medicines and Poisons Act, 1988. Consult the relevant sections of the Act for details of the appropriate legal requirements in **each case**

6.2 Medicines covered by the Act and which are also used in the MSTG are:

- **Morphine sulphate injection**
- **Morphine sulphate solution**

- **Pethidine hydrochloride injection**
- **Morphine sulphate tablets**

6.3 These medicines have potential for abuse which may be result in dependence. Carefully record all procedures involving them in the appropriate record books

6.4 Prescriptions for these medicines may only be written by registered medical practitioners

6.5 The following legal requirements must also be observed when writing such prescriptions:

a) the prescription must be in the prescriber's own handwriting
b) it must be signed and dated
c) the prescriber's address must be shown
d) the name and address of the patient must be stated
e) the total amount of the item to be supplied must be stated in words and figures

6.6 It is an offence for the prescriber to issue and for the pharmacy/dispensary to dispense prescriptions for controlled medicines, unless the requirements of the law are fully complied with

Notes:

a) In certain *exceptional* circumstances, senior nurses in charge of departments, wards, or theatres, and midwives, may also obtain and administer certain controlled medicines as part of their work. The relevant sections of the Act should be consulted for the details of the appropriate legal requirements in each case
b) Hospital in-patient prescriptions for controlled medicines should be prescribed on a separate prescription as well as written on treatment cards or case sheets and signed/dated by the person administering the medicine.

7. Adverse drug reactions (ADRs)

7.1 Nearly all medicines may produce unwanted or unexpected adverse effects, some of which may be life threatening e.g. anaphylactic shock, liver failure

7.2 Prescribers should immediately report any serious or unexpected adverse effects thought to be due to a medicine to :

The Registrar,
Pharmacy, Medicines and Poisons Board,
PO Box 30241, Lilongwe.
Tel: 01 755 165/166 Fax: 01 755 204

7.3 Rules for prevention of ADRs

a) Never use a medicine unless there is a clear indication for its use
   a. Only use medicines in pregnancy if absolutely essential
   b. Check if the patient has had any previous reactions to the medicine or to similar medicines
   c. Remember to reduce doses when necessary e.g. in the young, the elderly, and if liver or renal disease is present
   d. Always prescribe the minimum number of medicines possible
   e. Carefully explain the dose regimens to patients, especially those on multiple medicines, the elderly and anyone likely to misunderstand
   f. If possible, use medicines with which you are familiar
   g. Look out for ADRs when using new or unfamiliar medicines
   h. Warn patients about likely adverse effects and advise them on what to do if they occur
   i. Patients on certain prolonged treatments e.g. Anticoagulants, corticosteroids, Insulin etc should carry a small card giving information about the treatment

8. Paediatric prescribing

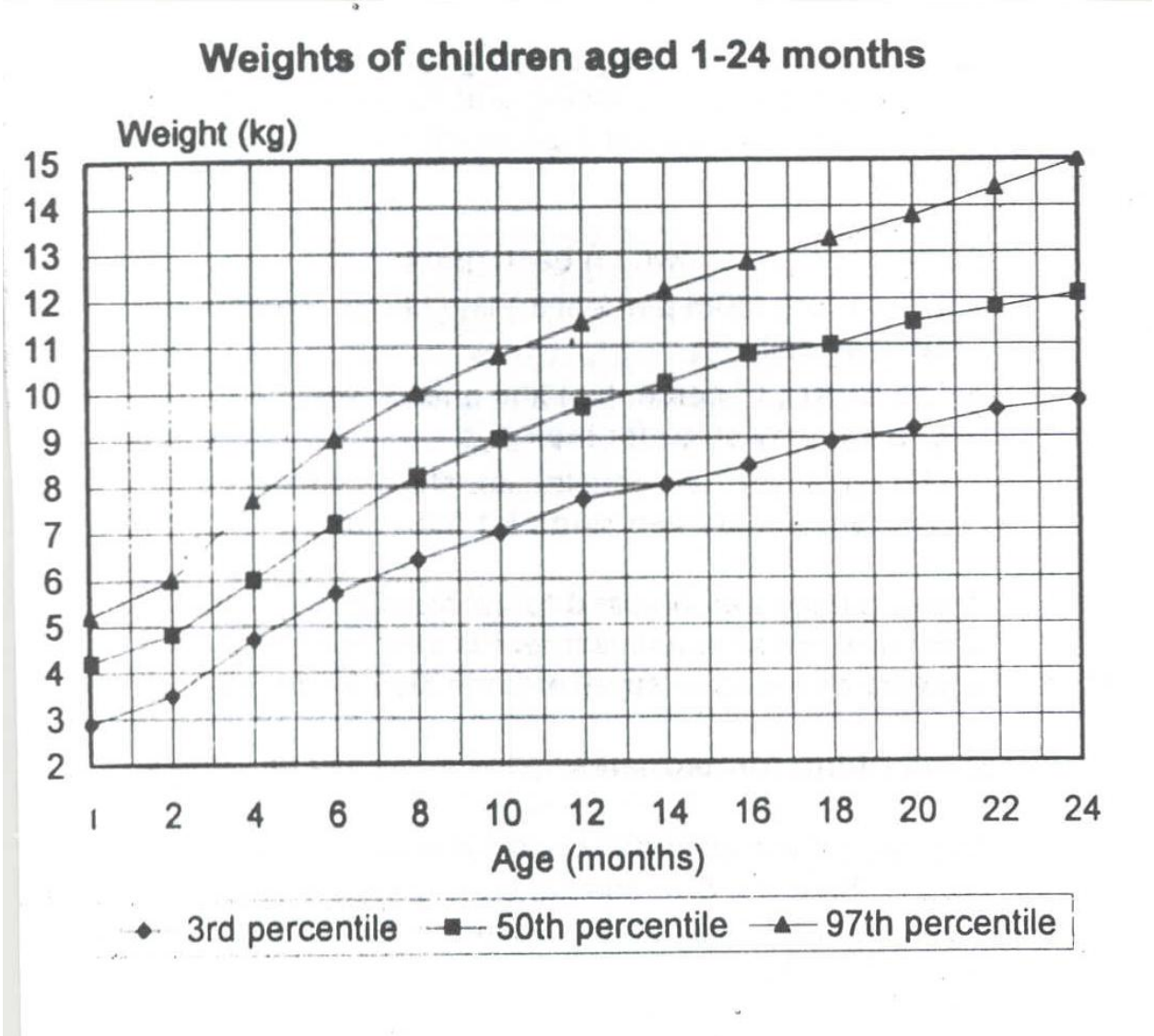
8.1 In these guidelines, paediatric medicine doses are usually given according to body weight and not age, and are therefore expressed as mg/kg etc. The main reason for this is that children of the same age may vary significantly in weight.

Thus it is safer and more accurate to prescribe drugs according to body weight. Moreover, this should encourage the good practise of weighing children whenever possible.

8.2 When a weighing scale is not available, the following graphs showing weight of children from 1-24 months and 2-15 years respectively can be used to estimate the weight of a child of known age after assessment of whether the child appears of average, small or large in size for its age.

Three lines are shown on each graph

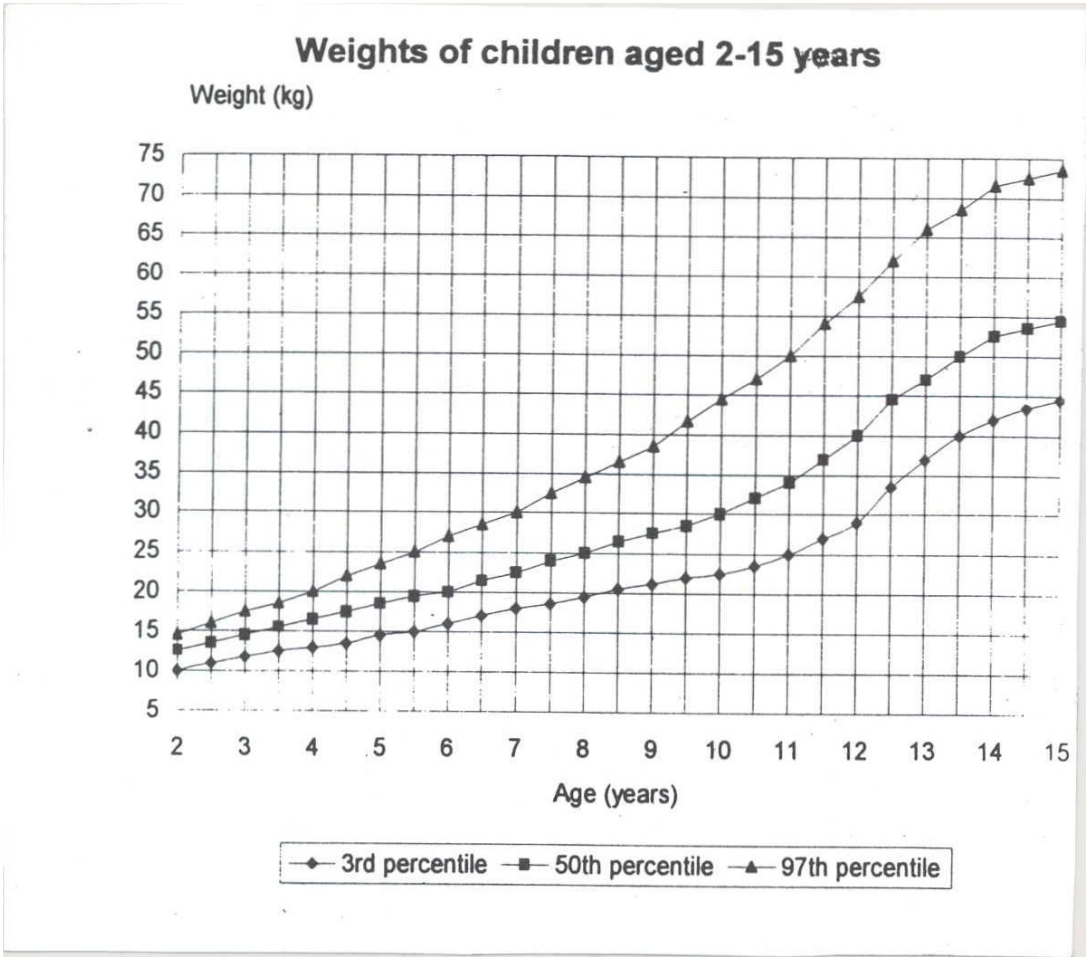
- the middle (50th percentile) line shows weight for average children
- the lower (3rd percentile) line shows weights for children who are very small for their age
- the upper (97th percentile) line shows weights for children who are very large for their age



Example: When prescribing for an 8 months old baby who is fatter than usual, (i.e. larger than average weight for age):

- look along the x-axis (age) of the graph to the 8 month mark

- follow the vertical line from there to the point somewhere between the middle (50th percentile) and top of (97th percentile) lines on the graph
- from there follow a horizontal line left to cut the y-axis (weight)
- the estimated weight is around 10 kg



Example: when prescribing for an $8^1/_2$ year old thin child, (i.e. less than average weight for age) of years:

- Look along the x-axis (age) of the graph to mid way between the 8 and 9 year marks
- Follow the vertical line from there until it meets the lower (3rd percentile) line on the graph
- From there follow a horizontal line left to cut the y-axis (weight)
- The estimated weight is around 20.5 kg

8.3 Neonates have delayed hepatic and renal excretion of medicines. Therefore give special consideration when prescribing for children less than 30 days old and especially premature infants.

9. Medicine interactions

9.1 Whenever prescribing a particular medicine, care should be taken to avoid problems of interactions with other medicines, whether these are:

- also prescribed at the same time
- previously prescribed by another prescriber for the same or another condition and currently being taken by the patient
- purchased or otherwise obtained by the patient for the purpose of self-medication

9.2 Thus, before prescribing a medicine, *always* obtain details of any other medication currently being taken by the patient

9.3 Where a medicine interacts with alcohol (e.g. metronidazole, diazepam, anti-diabetic medicines, tricyclic antidepressants etc.) remember to counsel the patient to avoid taking alcoholic drinks during the course of treatment and for at least 48 hours after completion of the course

Presentation of Information

a. Arrangement of sections

Standard treatments have been grouped in sections according to either body systems (e.g. respiratory conditions, gastrointestinal conditions, etc) or types of disorder (e.g. parasitic diseases, nutritional disorders, etc)

Use the table of contents, pp ii, to locate the particular section required.

b. **Indexing and Cross-referencing**

All diseases, conditions, tables, etc are included in an index. Extensive cross-references are given in the text, by section number and page number, to facilitate location of other references to the subject elsewhere in the guidelines.

Use the Index on page 201-208 to quickly find the required subject.

Prescriber's guidance points

- These are given for most standard treatments and are key points to be considered before prescribing for a patient with a particular condition.
- Certain points as well as warnings are given added emphasis by inclusion in a boxed border.

Medicine administration

- Unless otherwise specified, the *oral route* is to be used. Even when a parental route is specified, with medicines which are well absorbed orally and which are available as an oral dosage-form, it is often possible to switch to oral administration once the patient has improved and is able to swallow/tolerate oral medication
- Additional guidance on medicine administration is given, where relevant, as bulleted points after dosage regimen.

Medicine names

- Medicines recommended for use are those on the current Malawi National Medicine List, 2009. Generic names are used and indicated in **bold type**. Where necessary, proprietary names are indicated in *italic* type.

Alternative medicines

- These are indicated where appropriate and available for alternative treatment of a particular condition. They should be used only if the recommended medicine is not available or is not suitable for a particular patient.
- In some cases (where indicated) alternative (i.e. 2nd line) medicines may be used when a satisfactory response has not been obtained with the recommended (1st line) medication.

Abbreviations

ARI	-	Acute respiratory infections
ART	-	Anti retroviral therapy
BF	-	blood film examination
BP	-	blood pressure
CSF	-	cerebrospinal fluid
CVA	-	cerebrovascular accident
CXR	-	chest x-ray
DIC	-	disseminated intravascular coagulopathy
FBC	-	Full blood count
FFP	-	Fresh Frozen Plasma
g	-	gram
Hb	-	haemoglobin
HIV	-	Human immunodeficiency virus
i/m	-	intramuscular
i/v	-	intravenous
IU	-	international units
JVP	-	juvenile venous pressure
Kg	-	kilogram
L	-	litre
LP	-	lumbar puncture
LRTI	-	lower respiratory tract infection
mg	-	milligram
mL	-	milliliter
mmol	-	millimole
MU	-	mega (1 million) units
NGT	-	nasogastric tube
PCV	-	packed cell volume
s/c	-	subcutaneous
STI	-	sexually transmitted infections
TB	-	Tuberculosis
TTP	-	Thrombotic thrombocytopenic purpura
URTI	-	upper respiratory tract infection

Metric Units

1 kilogram (kg)	= 1,000 grams (g)
1 g	= 1,000 milligrams (mg)
1 mg	= 1,000 micrograms
1 litre (L)	= 1,000 millilitres
1 ml of water	=1 g
1% (m/v)	= 10 mg/mL

Equivalents

1 litre	= 1.8 pints
1 pint	= 568.3 mL
1 kg	= 2.2 pounds
1 lb	= 453.4 g
1 ounce (oz)	= 28.35 g

1.0 Blood and blood diseases

1.1 Blood: Guidelines for Appropriate Use

- Refer to the National Transfusion Service/National AIDS Control programme booklet **Recommended Guidelines for the Practice of Safe Blood Transfusion in Malawi** for further details including information on:
  - donor recruitment and selection,
  - blood collection,
  - storage procedures and records,
  - laboratory testing of donor and recipient's blood,
  - transfusion reactions and
  - clinical aspects of blood transfusion and administration.
- Blood transfusion although having undoubted benefits, also carries serious risks including:
  - Possible transfusion of infections (e.g. HIV and hepatitis)
  - Immune-system related problems (e.g. Intravascular haemolysis)
  - Circulatory overload
- It is expensive and uses a scarce human resource, therefore *only* prescribe blood if:
  - Less hazardous therapy has been or will be ineffective, *and*
  - The benefits outweigh the risks involved
  - The decision to transfuse blood has been based on careful assessment of the patient which indicates that it is necessary to save life or prevent major morbidity
- Except in the most exceptional life-threatening situations, *always* transfuse blood which has been obtained from appropriately screened donors and/or appropriately screened for infectious agents
- Ensure that compatibility testing is carried out on **all** blood transfused even if, in life-threatening emergencies, this is done after it has been issued.
- Observations of patient's vital signs should be done every 15 minutes during blood transfusion and 4 hourly after transfusion for the next 24 hours.

1.2 Indications for whole blood or red cell suspension transfusion

1.2.1 Severe anaemia

Neonates

- If Hb less than 9 g/dl and requiring oxygen or with haemodynamic disturbance (e.g. shock, heart failure)

Children and infants

- If Hb less than 4 g/dl or PCV <12
- If Hb less than 6 g/dl or PCV <18 and there are clinical complications e.g. heart failure

Dose

- Transfuse 20ml/kg of whole blood or 10ml/kg of red cell suspension
- In severely malnourished children give 10mls/kg of whole blood over 4 hours and frusemide 1mg/kg should be given with the transfusion

Pregnancy

- If Hb less than 7 g/dl at any time during pregnancy
- If Hb less than 10 g/dl during the 3rd trimester

Adults

- If Hb less than 6 g/dl
- If Hb less than 7 g/dl and there are clinical complications

Dose

- One unit of whole blood or one unit of red cell suspension will raise a patient's haemoglobin by 1-1.5g/dl

Pre-operatively Surgery

- If Hb less than 7 g/dl

1.2.3 Acute haemorrhage with shock (*See Section 1.5 page 4, Table 1*)

1.2.4. Intra-operative use (where necessary)

Note: Do not use whole blood or red cell suspension transfusion to expand blood volume

1.3 Platelets

- Platelets have a short half life of 5 days
- Must be transfused immediately upon arrival. Platelets should never be stored in a refrigerator or blood bank or in the ward.
- Decision to transfuse should be based on a combination of clinical and laboratory findings rather than empirical platelet levels.

1.3.1 Indications for platelets use

- Bleeding due to thrombocytopenia as a result of defective platelet production such as aplastic anaemia or leukaemia
- Increased consumption e.g DIC
- Dilutional effects e.g. in massive transfusion

  Note: All patients needing platelets need further investigations, please refer to Central Hospital.

Dose

- 1 unit per 10kg
- For infants under 10 kg, 5ml/kg

1.4 Fresh frozen plasma

- Contains all clotting factors
- Comes in volumes of 200-300 mls
- Fresh frozen plasma (FFP) should be thawed before use using water bath at 30-37 degrees. (If water bath is not available, a plastic basin with lukewarm water or cold tap water can be used.) Never use hot water
- Once thawed, FFP must be used immediately. FFP must never be refrozen.
- The patient needs further investigations; please refer to the central hospital.

1.4.1 Indications for use of fresh frozen plasma

- Replacement of single factor deficiencies (if single factor concentrates are not available)
- Immediate reversal of warfarin effect
- Vitamin K deficiency associated with active bleeding
- Acute disseminated intravascular coagulopathy

- Thrombotic thrombocytopenic purpura (TTP)
- May be used in massive transfusion or liver disease

Dose

15-20ml/kg

Note: No justification for use in hypovolaemia, nutritional support in protein losing states, plasma exchange except in TTP.

1.5 Acute haemorrhage

- In massive haemorrhage i.e. from trauma it is difficult to estimate how much blood a patient has lost. However a good estimate can be made by calculating the patient's normal circulating volume versus vital signs and other organ function tests. *See Table 1 below*.
- Restoration of blood volume with suitable replacement fluids **(***see note above*) is more important than red cell replacement in the management of previously healthy patients who have lost under 30% of their blood volume.
- The need for blood transfusion must be determined by:
  - The amount and speed of blood loss
  - The patient's vital signs

Table 1: Assessment of Blood Loss (For a 70 kg adult)

	Stage 1	**Stage 2**	**Stage 3**	**Stage 4**
Blood loss (litres)	<0.75	0.75-1.5	1.5-2	>2
Pulse rate	<100	>100	>120	>140
BP	Normal	Normal	90/60	<70
Respiratory Rate	<20	>20	>30	>40
Capillary Refill	<3 seconds	<3 seconds	>3 seconds	>3 seconds
Mental State	Normal	Anxious	Confused	Lethargic
Urine output/Hour	>30 mls	20-30 mls	<20 mls	<10 mls
Replacement fluid vol (L)	2L	2-4.5L	>5L plus 2 units blood	>6L plus 3 units blood

- Replacement fluids which may be used are:
  - **Haemacel :** Replace every 1 ml of blood lost with 1 ml of fluid
  - **Sodium lactate compound** (Ringers lactate) i/v infusion or **Normal saline** i/v infusion Replace 1 ml of blood lost with 3 mls of fluid.

Do not use dextrose 5% or Darrow's ½ strength in dextrose 5% as replacement fluid

- Maintain the airway and give oxygen by face mask first, especially for patients in stage 3 and 4. Make sure they are breathing adequately.
- Insert 2 large bore cannulae (gauge 14 or 16) and collect blood samples for full blood count (FBC), grouping and cross-matching.
- Give half of the calculated dose of replacement fluid in the first hour and give the other half over 3 hours.
- Always assess the effects of fluid therapy. Remember to give warm fluids and cover patients to avoid hypothermia.
- Aim at improving oxygen carrying capacity first before correcting anaemia. Remember to add maintenance fluids to the replacement fluid plus any on-going losses.

Note: Maintenance fluids can be calculated as follows:

(i) *Adults*: Body weight x 1.5mls

(ii) *Children*: May use the rule of 4.2.1 for children or refer to section on diarrhoea. (*Section 7.5 page 42*)

- Remember : deficit + maintenance + on-going loss

1.6 Adverse reactions to transfusion

- Suspect an adverse reaction if any of the following occurs:
  - Severe pain at transfusion site or in the back, chest or hand
  - Rise in temperature of 1^{o}C above the baseline
  - Increase in pulse rate of >20/minute above baseline
  - Fall in systolic BP >20 mm Hg
  - Urticaria
  - Rigors
  - Haemoglobinuria
  - Shortness of breath,
  - Wheezing
- If a reaction occurs within 15 minutes then
  - Stop the transfusion.
  - Set up a normal saline infusion in the opposite arm.
  - **Inform a clinician.**
- If a reaction occurs after 15 minutes then
  - Inform clinician for a decision on what action to take
  - If Medical Officer is not available to assess patient within 15 minutes of being informed stop the transfusion.

1.6.1 Mild reaction

- *Signs and symptoms*: itchy rash

Treatment

- Slow the transfusion
- Give **Chlorpheniramine** 10mg i/m stat

Alternative

- **Promethazine** 25 mg i/m stat
- Continue transfusion if there is no progression of symptoms after 30minutes
- If symptoms persist, treat as moderate reaction.

1.6.2 Moderate reaction

- *Signs and symptoms:* Severe itching, urticaria, fever,rigors, tachycardia

Treatment

- Stop the transfusion
- Set up a normal saline infusion in the opposite arm
- Inform clinician
- Give **Hydrocortisone** 200mg i/v stat,

Alternative

- **Chlorpheniramine** 10 mg i/m stat
- If wheezing, give bronchodilator *see Section 16.2.1 page 137*.
- If no improvement treat as life threatening reaction

1.6.3 Life Threatening Reactions

- Stop blood transfusion, but keep i/v line open with normal saline
- Maintain airway and give oxygen
- Give **Adrenaline** 0.01mg/kg body weight
- Treat shock (*See Section 5.1.1 page 29*)

1.7 Sickle cell disease

- Educate patient and family on the nature and complications of the disease
- Avoid factors precipitating sickle cell crises such as:
  - Dehydration
  - Exposure to cold
  - Extreme physical exercise

- High altitude

Treatment

Anti- malarial prophylaxis

- **SP 525mg** as a single dose each month

Alternatively

- **Proguanil 200mg daily** or **Chloroquine 250mg**
- Encourage to be sleeping under an insecticide treated bed net (ITN) every night
- **Folic acid 5mg** daily
- In children more than 6 months old, long term antibiotic prophylaxis
  - **Benzathine penicillin** 1.2 MU i/m once monthly
  - < 30 kg: give **Benzathine penicillin** 600,000 MU/dose

Alternatively

- **Phenoxymethylpenicillin** 250 mg 8 hourly daily
- Refer for further consultation

1.7.1 Sickle cell disease crisis

- Consider sickle cell crisis in the following:
  - Dactylitis –hand foot swelling in early infancy.
  - Painful crisis –involving muscle, bone, lung and intestines.
  - Life threatening decline in haemoglobin levels due to aplastic crisis,sequestration crisis and haemolytic crisis
  - Priapism-sudden painful onset of a tumescent penis that will not relax. Occurs typically in boys between 6 and 20 years old
  - Stroke

Management

- Rehydration therapy
- Give analgesics usually with narcotics or non steroidal anti-inflammatory drugs *(See Section 24 page 196)*
- Give oxygen
- Consider
  - blood transfusion for severe anaemia
  - Antibiotics
  - Follow-up through monthly clinics
- Diagnose and treat the precipitating caus

2.0 Cardiovascular diseases

2.1 Acute Pulmonary Edema

Signs and symptoms: dyspnoea, cough {often with frothy, pink-tinged sputum}, tachypnoea, signs of increased respiratory effort and diffuse rales or crackles.

General measure

- Prop up patient to sitting position
- Restrict fluids

Treatment

- Oxygen therapy
- Drain pleural effusions if present.

Adults

- **Frusemide** 40-80 mg slow i/v (over 5 mins). Repeat if required
- **Morphine** 5-10 mg slow i/v and **Metoclopramide** 10mg i/v. Repeat both if required.
- *If no response:* Give **Aminophylline** 250-500 mg slow i/v (over 10-20 mins)

Children

- Give **Morphine** 5-10 mg slow i/v (over 5 mins) Repeat every 4 hours if required
- Give **Frusemide** 1-2mg/kg.
- Specific treatment should be given according to the cause e.g. hypertension

2.2 Congestive Heart Failure

Signs and symptoms include tachycardia, hepatomegaly, oedema raised JVP.

- Extra cardiac symptoms may be the primary manifestation in children and these may include tachypnea, wheezing, poor feeding, sweating, cough, excessive weight gain and failure to thrive
- Look for underlying cause or precipitating and aggravating factors (e.g. hypertension, anemia, pericardial effusion, arrhythmia, infection and hyperthyroidism) and treat accordingly.

General measures

- Reduce salt intake
- Prop the patient up on pillows
- Treat underlying cause if possible, e.g. anaemia, rheumatic carditis, hypertension
- Bed rest in severe cases, reduced activity in milder cases,
- Give oxygen if cyanosed or restless

Treatment

Adults

- **Frusemide** 40-160 mg daily in divided doses plus

- **Enalapril** 10-20 mg once or twice daily

Alternatively

- **Spironolactone** 25mg once daily
- If atrial fibrillation is present add **Digoxin** 0.25mg every 6 hours. on first day then from day two onwards, **Digoxin** 0.125-0.25 mg daily
- If rapid atrial fibrillation is present (heart rate >100/min), a loading dose of 0.75mg – 1mg in divided doses on the first day can be given
- Treat underlying cause

Note: Potassium supplementation is not required in patients on frusemide and enalapril or spironolactone.

Children

- Give **Frusemide** 1-2 mg/kg orally or i/v once or twice daily

2.3 Hypertension

- Diagnosis is based on a raised blood pressure measured while patient is at rest on at least 3 separate readings.
- Hypertension is generally asymptomatic.
- Essential hypertension is unusual in children and young adults and an underlying cause should be excluded at hospital level
- Refer all children with hypertension to a doctor for management
- A child's expected BP can be calculated as:
    - Mean systolic BP = (age in years x 2) + 80
    - Mean diastolic BP = 2/3 of systolic BP

- Remember to use the correct cuff size when measuring BP. It should cover 2/3 of the upper arm

Table 2: Classification of Hypertension

Type of Hypertension	Systolic Blood Pressure	Diastolic Blood Pressure
Mild	140-159	90-99
Moderate	160-179	100-109
Severe	>180	>110

General measures

- Reduce salt intake
- Stop smoking
- Regular exercise
- Loose weight
- Avoid excessive alcohol consumption

- Consider medicine treatment for mild hypertension only if the above general measures are unsuccessful

Treatment

- Explain to the patient that treatment must be regular (every day), closely monitored and generally has to be taken for life
- Use the following stepped treatment approach with the medicines *in this order* unless there are specific contraindications, co-morbidities or side-effects:

2.3.1 Stepped anti-hypertensive treatment approach (adults)

- **Step 1: Hydrochlorthiazide** 25 mg each morning, increasing the dose is not advised

Alternatively

Bendrofluazide 2.5 mg each morning. Avoid in pregnancy and breast-feeding

- **Step 2**: **Hydrochlorthiazide** 25mg once daily and **Amlodipine** 5-10mg once daily
- Where Amlodipine is not available **Nifedipine** 10-20mg slow release tablets twice daily can be used.

- **Step 3**: **Hydrochlorthiazide** 25mg once daily, **Amlodipine** 5-10 mg once daily and **Enalapril** 10-20mg once daily
- Where Enalapril is not available **Captopril** 12.5-50mg every 8 hours can be used.

Note:

(i) Best to start with a lower dose of Enalapril 5mg and increase to 10mg after observation of the BP response over a few days.

(ii) Avoid Enalapril and Captopril in pregnancy and breast-feeding

- **Step 4**: **Hydrochlorthiazide** 25mg once daily, **Amlodipine** 5-10 mg once daily, **Enalapril** 10-20mg once daily and **Atenolol** 50-100mg once daily.
- Where Atenolol is not available **Propranolol** 40mg - 80mg every 8 hours can be used.
- **Step 5**: Refer to Medical Specialist

Note:

(i) Side-effects may outweigh benefits

(ii) In patients with severe hypertension or complications (heart failure, renal failure) start medicine treatment immediately

(iii) In patients without co-morbidity, aim for a BP of around 140/90

2.3.2 Emergency antihypertensive treatment

Symptoms/Signs of hypertensive crisis: encephalopathy, convulsions, retinal hemorrhages or blindness.

- Reduce the blood pressure in a controlled manner to avoid impaired auto-regulation of cerebral blood flow.
- Only use parenteral therapy in:
  - hypertensive heart failure
  - hypertensive encephalopathy
  - malignant hypertension
  - eclampsia
  - hypertension and dissecting aneurysm of the aorta

Note: Intravenous rapid lowering of blood pressure has several risks and should be done under close monitoring only, preferably in a high or intensive care setting. It is only indicated in hypertensive emergencies mentioned above.

Treatment

Adults

- **Hydralazine** 5-10 mg i/m
- Repeat up to every 1 hour as necessary
- *If heart failure:*add **Frusemide** 40 mg i/v stat

> Sub-lingual **nifedipine** (10 mg) should be avoided due to the unpredictable response of the blood pressure, unless parenteral drugs are unavailable.

Children

- *For fluid overload*: **Frusemide** 1 mg/kg bolus i/v or i/m
- *For hypertensive encephalopathy*: **Hydralazine** 0.15 mg/kg slow i/v
  - Repeat every 30-90 minutes as required
  - Maximum dose: 1.7-3.6 mg/kg in 24 hours
- Long term management of hypertension would depend on the cause hence these patients need to be referred for proper management.

2.4 Angina Pectoris

- Minimize risk factors by:
  - weight reduction (if obese)
  - control of hypertension
  - stopping smoking
- Address other factors such as:
  - high blood cholesterol
  - stressful lifestyle
  - excessive alcohol intake
- Encourage regular moderate exercise

2.4.1 Stable angina (infrequent attacks)

Treatment

- **Aspirin** 150 mg daily
  - contraindicated in peptic ulcer
- and **Glyceryl trinitrate** 0.5 mg sublingually as required.
- Maximum 3 tablets per 15 minutes
- deteriorates on storage: keep tablets in original container for no more than 3 months after opening
- Alernatively use **Isosorbide dinitrate** 5-10mg sublingually as required instead of glyceryl trinitrate

Prophylaxis:

- **Isosorbite dinitrate** 30-120 mg daily in 2 divided doses
- **Atenolol** 50mg daily

Alternatively

- **Amlodipine** 5-10mg daily may replace or be cautiously added to Atenolol.
- If pain continues despite the above treatment refer to Medical Specialist

3.0 Central nervous system conditions

3.1 Seizures and epilepsy

3.1.1 Seizures

- Sudden abnormal function of the body, often with loss of consciousness, and excess of muscular activity, or sometimes loss of it, or an abnormal sensation.
- Ensure airway is clear and patient is not hurting himself. Turn patient in a recovery position. Don't insert any object between the teeth
- Monitor blood sugar. If hypoglycemia is suspected, give 1 ml/kg 50% Dextrose or 5 ml/kg 10% Dextrose.

Treatment

Adults:

- Give **Diazepam** 5-10 mg i/v slowly. Repeat once after 10 minutes.
- If convulsions continue for another 10 minutes or are repeated more than 3 times without patient gaining consciousness between seizures, treat as status epilepticus (*Section 3.1.2 page 15).* If repeated seizures, consider antiepileptic therapy as in *Section 3.1.3 page 15.*
- Look for treatable causes and provoking factors (malaria, infection, tumour, alcohol).
- **Diazepam** i/m absorbs slowly and unreliably: i/v or rectal routes are preferable

3.1.1.1 Generalized seizures in children

Treatment

- **Sodium valproate** 20-40 mg/kg/day in 2 to 3 divided doses

Alternatively

- **Phenobarbitone** 5-8mg/kg daily.

or

- **Carbamazepine** 2.5mg/kg per dose twice dailyb,
- Increase the dose weekly by 5mg/kg until 20mg/kg is reached.

3.1.1.2 Partial seizures in children

Treatment

- **Carbamazepine** 5mg/kg/day in 2 divided doses (2.5mg/kg bd),

Alternatively

- **Sodium valproate** 20-40 mg/kg/day in 2 to 3 divided doses

3.1.1.3 Petit mal

Treatment

- **Ethosuximide** 15 mg/kg at night as a single dose increased gradually if necessary to 50 mg/kg daily in 2 divided doses

3.1.2 Status epilepticus

- Continuous seizure activity or seizures without recovery of consciousness for > 30 minutes
- Always an emergency, mortality is high.
- Clear airway, insert iv-line, position patient in a recovery position. Don't insert any object between the teeth.

Treatment

Adults:

- Give **Diazepam** 5-10 mg i/v. Repeat every 10 minutes until the patient stops convulsing. If patient not controlled give continuous diazepam i/v infusion with careful attention of respiratory depression.
- Give a loading dose of anti-epileptic medicines:
- **Phenytoin** 15 mg/kg (600-1200 mg) i/v. Dilute with 100 ml normal saline and give slowly, no more than 100 mg/minute.
- If still fitting after 10 minutes, then give **Phenobarbitone** 10 mg/kg (400-600 mg) i/v: dilute with water for injection 1:10 and give slowly, no more than 100 mg/minute. Or give 200 mg i/m in each buttock
- If status continues, use **Paraldehyde** 5 ml deep i/m in a buttock, and repeat 5 ml i/m in alternate buttock. Paraldehyde can also be given through the rectum using asyringe with needele removed.
- Ensure that the dose is given promptly and therefore remains in the syringe for only a short time (paraldehyde dissolves plastic)
- Check blood sugar. Give glucose, if suspicious of hypoglycemia, see *Section 6.1 page 36*

- Give **Thiamine** 100mg i/v or i/m once daily before giving glucose if patient suffers from alcoholism. Continue for 3 days.
- If still no improvement, consider general anaesthesia (in ICU setting preferably).
- If patient improves, start anti-epileptic treatment as in *Section 3.1.3 page 15* and continue until cause of status epilepticus is treated.

3.1.3 Epilepsy

- Repeated seizures due to a disorder of the brain cells.
- Look for treatable causes (infections, neuro-cysticercosis, tumour)
- Counsel patient: no bathing alone, careful with fire, driving and climbing.
- Young female patients should be advised to plan their pregnancy. When they wish to get pregnant **folic acid** once daily should be started and continued through the pregnancy.
- Doses may be reduced to the lowest level that still prevents convulsions.
- Treatment should not be stopped because of pregnancy: it is more dangerous for the mother and foetus to have uncontrollable seizures than to continue the anti-epileptic medicine.
- If patient has more than 2 seizures in a year of unknown cause, consider starting antiepileptic therapy.
- Always start with small dose.
- Increase dose gradually over weeks or months.
- Use maximum dose of one medicine before adding another.
- Treatment should never be stopped suddenly due to risk of status epilepticus, but rather tapered-off over weeks or months.

Treatment

- **Phenobarbitone sodium** 60-180 mg at night

Alternatively

- **Carbamazepine** 100 -200mg 1-2 times daily. Increase by 100 - 200 mg weekly until dose is 800 mg - 1200mg per day.

Alternatively

- **Sodium valproate** 600 - 2000mg daily divided in 2 doses.

Alternatitvely

- **Phenytoin** 150 - 300mg daily divided in 1-2 doses. Can be increased to 500mg daily.

3.2 Acute Stroke

- Sudden non-convulsive loss of neurological function due to ischemic or hemorrhagic vascular event.
  Remember brain infection as a differential diagnosis in HIV infected patients
- Risk factors include hypertension, diabetes, smoking, genetic disorders, atherosclerosis, cardiac disease, atrial fibrillation, HIV and high cholesterol.
- Look for treatable cause and counsel the patient.
- 85% of the strokes are ischaemic.

Treatment

- Long term **Aspirin** 75mg once daily

Note: Aspirin is not advised in intra-cerebral or subarachnoid hemorrhage.

- Give i/v fluids to correct any dehydration, avoid i/v glucose.
- Treat hyperglycemia (see *Section 6.1 page 36*).
- Treat any fever: look and treat for infections (aspiration pneumonia, urinary track infection common).
- Give **Paracetamol** 1g every 8 hours orally to reduce fever**.**
- Keep patient half seated if increased intracranial pressure is suspected (e.g. in drowsy or unconscious patients).
- Continue antihypertensive treatment if patient is already on treatment.
- Don't start new antihypertensives during the first 10 days.
- If hypertension is repeatedly higher than 180/120 mmHg, start **Hydrochlorthiazide** 25mg once daily orally
- Start physiotherapy on day 1.
- Start mobilisation as soon as it is possible. Consider referral to an institutional rehabilitation unit.

3.3 Psychiatric conditions

3.3.1 General guidelines on psychotropics use

- Identify complicating factors i.e. psychological, medical, social, etc.
- Review past successful medication and other interventions.
- Weigh the risks and benefits of any intervention.
- Involve the patients and their families in all decisions around treatment.
- Target symptoms e.g. use a more sedating agent if insomnia is a problem.
- Start with low doses and go slow.
- Avoid poly-pharmacy.

- Never stop medication suddenly. Wean off slowly.
- Take caution in special circumstances such as:
  - Pregnancy and lactation.
  - Elderly patients.
  - HIV Infection
  - Renal or hepatic impairment.
  - Medicine interaction.
- Psychosocial interventions are imperative.

3.4 Organic Disorders

3.4.1 Delirium

- Impairment of consciousness, usually accompanied by global impairment of cognitive functions, usually acute and reversible

Symptoms/signs: fluctuating level of consciousness, disorientation, perceptual disturbances

- Look for treatable causes: systemic and CNS infections, hypoxia, hypo- or hyperglycaemia, drugs, alcohol excess or withdrawal (delirium tremens), mental illness, post-convulsion phase in epilepsy, head trauma, subdural hematoma, stroke etc.

Treatment

- Identify and treat underlying cause
- **Haloperidol** 2 - 5mg or **Chlopromazine** 50 - 75mg
- use sedatives cautiously

3.4.2. Dementia

- Chronic disorder characterised by multiple cognitive deficits, including memory loss, but no impairment of consciousness

*Symptoms/signs***:** disturbances of orientation, memory, intellectual function, personality changes

Treatment

- Supportive e.g. proper nutrition and exercise.
- Avoid barbiturates and benzodiazepines

3.5 Temporal Lobe Epilepsy

Symptoms/signs: Auras, illusions, hallucinations, personalization, derealisation

Treatment

- **Carbamazepine** 200 - 600mg twice daily,
  Alternative
- **Phenytoin** 100 - 150mg one daily

3.6 Alcohol Related Disorders

3.6.1 Alcohol intoxication

- Drunkenness, recent ingestion of sufficient amount of alcohol to produce acute maladaptive behaviour

Symptoms/signs: euphoria, talkativeness, aggression, labile mood

Treatment:

- Usually supportive.

3.6.2 Alcohol Withdrawal Syndrome

- Syndrome that occurs within several hours of cessation, or reduction after prolonged heavy consumption

Symptoms/signs: Autonomic hyper activity, hand tremor, insomnia, transient illusions or hallucinations (visual and tactile) and seizures.

Treatment

- May need admission to hospital as an emergency
- Treat psychotic symptoms (confusion, delusions, hallucination) with **Haloperidol** 2mg-10mg orally (or by deep i/m if necessary) as required until the delirious state improves
- Sedate with **Diazepam** 10 mg i/v initially then orally every 8 hours
- **Vitamin B1 (Thiamine hydrochloride)** 100 - 200mg daily, 3-5 days, i/m

Alternatively

- **Vitamin B Complex** i/m then orally for 2 weeks
- Reduce dose as soon as acute phase begins to settle.
- Give fluid replacement as required.

Note:

(i) Do not discharge the patient on diazepam due to the risk of dependence.This condition has a high mortality rate.

(ii) Delirium tremens is a medical emergency and requires supportive measures.

3.6.3 Wernicke (and Korsakoff) Encephalopathy

- Amnesia, confabulation and oculomotor disturbances.
- Due to Vitamin B1 deficiency in alcoholics and malnourished non-alcoholics

Treatment

- **Vitamin B1** 100 mg i/v or /i/m 3-7 days.
- **Glucose** (5-10%) i/v with **multivitamins** orally and/or **Vitamin B complex** can be given.
- Glucose without Vitamin B1 can worsen Wernicke's encephalopathy.
- After Vitamin B1 injections, continue with Vitamin B1 25 - 100 mg orally once daily.
- To treat delirium tremens: see *Section 3.4.1 page 18*

3.6.4 Alcoholic Hallucinosis

- Syndrome characterised by vivid persistent hallucinations following a decrease in alcohol consumption, in a dependent person.

Treatment

- **Diazepam** 5-10mg and **Haloperidol** 2-5mg stat or **Chlorpromazine** 50-100mg stat

3.6.5 Physical and neurological complications of alcohol dependence

- Counsel the patient
- Abstinence may be essential
- Refer to Alcoholic Anonymous groups
- Encourage a healthy diet with high protein and vitamin content (give vitamin B complex if necessary)
- Treat specific disorders symptomatically (e.g. gastro-intestinal disorders, cirrhosis, neuropathy)

3.6.6 Treatment of psychological and social complications

- Counsel the patient
- Educate and support the family

3.7 Anxiety disorders

Types:

i. *Panic disorder:* characterized by spontaneous panic attacks
ii. *Generalized anxiety disorder:* excessive worry about actual circumstances/ events

iii. *Phobias:* irrational fear of objects/ public situations.
iv. *Post traumatic stress disorder:* anxiety produced by extraordinary stressful events, re-occurs as flashbacks.
v. *Obsessive compulsive disorder:* recurrent intrusive ideas, images thoughts or repetitive ritualized patterns of behavior

Symptoms/signs:

Excessive anxiety and worry
Persistent excessive and unreasonable worry

Treatment

- **Diazepam** 2-10mg 2-4 times daily
- **Fluoxetine** 20-60mg daily
- Psychotherapy

3.8 Pyschiatric Emergencies

3.8.1 Attempted suicide

Risk factors: males, older age, non-married, physically unwell, mentally unwell
General Measures

- Do not leave them alone
- Take threats seriously
- Treat underlying disorders e.g. depression
- Hospitalize unless if properly supervised at home

3.8.2 Violence

- **Associated disorders**: psychotic disorders, substance intoxication, withdrawal states, post ictal disturbances
- **Violence predictors:** previous acts of violence, verbal/physical threats, paranoid feature, violent command hallucinations, alcohol or medicine intoxication

General Measure:

- protect yourself, have enough people to handle patient, don't immediately remove physical restraints

Treatment

- Slow i/v **Diazepam** 10-20mg
- Intra muscular **Haloperidol** 5mg or **Chlorpromazine** 50-150mg

3.9 Psychotic Disorders

3.9.1 Schizophrenia

Symptoms/signs: delusions, hallucinations, abnormal affect diminished level of function, illogical thoughts

Treatment:

- **Chlorpromazine** 100mg once daily

Alternatively

- **Haloperidol** 2-30mg once daily
- If catatonic use Electroconvulsive therapy (ECT), **Fluphenazine decanoate** 25mg i/m monthly for chronic cases
- Psychosocial interventions and psycho-education.

3.9.2 Substance Induced Psychosis

- Psychotic features in a patient who has used psychoactive substances in last 2 months

Symptoms/signs: Aggression, hallucinations (visual), illusions, delusions

Treatment

- **Chlorpromazine** 100mg twice daily for 1 month
- **Haloperidol** 2mg twice daily for I month **,**
- **Diazepam 5 -**10mg twice daily for 7 days
- Counseling
- Psychotherapy

3.9.3 Post Partum Psychosis

- Psychotic illness developing days, weeks, months after delivery
- Also refer to *Section 12 page 98*

Treatment

- Counseling,
- **Chlorpromazine** 50 **-** 100mg twice daily for 2 weeks
- ECT in extreme cases

3.10 Mood Disorders

- Disorders characterized by a pervasive emotional tone that profoundly influence ones outlook and perception of self, others and environment

3.10.1 Depression

- Disorder characterised by low affect for over two weeks

Symptoms/signs: depressed mood, anhedonia, social withdrawal, weight loss/ gain, insomnia

Treatment

- **Amitriptyline** 100-150mg at bedtime, start from 25mg and titrate
- **Fluoxetine** 20mg once daily
- ECT in very severe cases

3.10.1.1 Post Partum Depression

- Severe depression beginning within 4 weeks of delivery. Most often in women with underlying mood or other psychiatric disorder

Symptoms/signs: insomnia, emotional lability, suicide, delusions

Treatment

- **Amitriptylline** 50 – 100 mg at night for one month
- **Imipramine** 100 - 150mg at night,
- **Fluoxetine** 20 - 40mg in the morning

3.11 Mania

- Disorder characterised by elated mood

Symptoms/signs: erratic/disinhibited behaviour, excessive energy, excessive spending, euphoria, delusions (grandiosity)

*Treatment***:**

- **Chlorpromazine** 100mg twice daily for 1 month
- **Carbamezapine** 200mg - 600mg once daily for 1 month
- **Haloperidol** 2mg -10mg twice daily for 1 month

4.0 Ear Nose and Throat Conditions

4.1 Mastoiditis

- A bone infection characterised by painful swelling behind or above the ear.
- Watch for complications of brain involvement (meningitis or brain abscess).
- Surgical drainage may be necessary.
- Refer patient to hospital

Treatment
Adults

- **Ampicillin** 1g every 8hourly for 5 days plus
- **Flucloxacillin 500mg** i/m, 6 hourly for 5 days plus
- **Metronidazole 500mg** i/v, 8 hourly for 5 days
- Analgesics as necessary See *Section 24.1 page 196* on Pain Relief

Alternatively

- **Ceftriaxone** 2g daily for 5 days

Children

- **Ampicillin** 25 – 50mg/kg i/m or i/v every 8 hours for 5 days

4.2 Otitis

4.2.1 Otitis Externa

- This is an inflammation of the skin lining the external auditory canal. May be a furuncle or diffuse.

Treatment

(a) Furuncle

- Analgesia
- **Flucloxacillin** 500mg every 6 hours for 5 days

Alternatively

- **Cloxacillin** 500mg every 6 hours for 5 days
- Make a wick of ribbon gauze impregenated with ointment containing **Hydrocortisone** or **Betamethasone cream** and gently insert in the ear for 2 to 3 days.

(b) Diffuse Otitis Externa

- Analgesia when necessary

- Dry mop the ear
- **Acetic acid** ear drops 2% in **Alcohol** 6 hourly for 5 days

4.2.2 Acute Otitis Media (Children)

- Local medicine treatment is ineffective and should be avoided

> Acute otitis media is often viral in origin and needs only a simple analgesic for pain

Symptoms/Signs: Fever in about 50% of patients, sudden persistent ear pain or pus discharge for < 2 weeks

Treatment

- **Amoxycillin** 15 mg/kg every 8 hours for 5 days

Alternatively

- **Erythromycin 6.25 mg/kg** every 6 hours for patients with penicillin allergy
- Give analgesia as required *Section 24.1 page 196*

4.2.3 Chronic (Suppurative) Otitis Media

- Pus discharge from the ear for over 2 weeks
- If the eardrum has been ruptured for over 2 weeks, secondary infection with multiple organisms usually occurs
- Common in immunosuppressed patients
- This makes oral antibiotic therapy much less effective.

Treatment

- Ensure ear is alway dry.

Note: A chronically draining ear can only heal if it is **dry**. Drying the ear is time consuming for both the health worker and the mother but it is the only effective measure.

- The mainstay of treatment is topical therapy with **Acetic acid** ear drops 2% in Alcohol 6 hourly for 5 days
- Demonstrate/explain carefully to the patient (or guardian in the case of a child) how to dry the ear by wicking (see below)
- Refer for further assessment if no improvement after 3-4 weeks therapy
- **Dry the ear by wicking**
  - Roll a piece of clean absorbent cloth into a wick and insert carefully into the patient's ear
  - Commercially made ear buds should be avoided in cleaning the ear
  - Leave for one minute

- Remove and replace with a clean wick
- Watch the patient/guardian repeat this until the wick is dry when removed
- The patient/guardian should dry the ear by wicking at home at least four times daily until the wick stays dry
- If bleeding occurs, temporarily stop drying the ear
- Do not leave anything in the ear between treatments
- The patient should avoid swimming or otherwise getting the inside of the ear wet

- Re-assess weekly to ensure that patient/mother is drying the ear correctly
- Check for mastoiditis

Note: TB is an important cause of a chronically discharging ear in Malawi

4.3 Nose Conditions

4.3.1 Epistaxis

- Bleeding can be bilateral or unilateral.
- Causes include trauma, repeated nose pickings, infections such as rhinosinusitis, systemic causes such as hypertension, bleeding disorders, anaemia and leukamia etc.

Treatment

- Pinch the nose alar (wings) for 5 to 10 minutes. Let the patient lean forward and breathe through the mouth.

Alternatively

- Apply cold pack or ice block to the forehead
- Use ribbon gauze impregnated with liquid paraffin

Alternatively

- Apply nasal packs soaked in **Adrenaline**

Note: Avoid use of adrenaline in hypertensive patients

- If bleeding continues, refer to hospital

4.3.2 Vestibulitis

- Diffuse infection of the skin of the anterior nares and may occur due to frequent trauma such as occurs in constant nose picking.
- Persistent nasal discharge leads to excoriation and infection of the skin of the nasal vestibule

Treatment

- Analgesia, see *Section 24.1 page 196* on pain relief
- **Amoxycillin** 500mg 8 hourly for 5 days *and*
- **Liquid paraffin** 2 drops each nose 3 times a day

4.3.3 Sinusitis

- Inflammation of one or more sinuses that occurs most often after a viral nasal infection or allergic rhinitis.

4.3.3.1 Bacterial Sinusitis

Symptoms/Signs: purulent nasal discharge, persistent or intermittent, pain and tenderness over one or more sinuses, nasal obstruction, postnasal discharge, occasional fever.

Note: (1) Sinusitis is uncommon in children under five years as sinuses are not fully developed

(2) Unilateral foul smelling nasal discharge is a foreign body until proven otherwise

Treatment

Adults

- **Oxymetazoline 0.05%** 2 drops twice a day for not more than one week
- **Cetrizine** 10mg daily for 3-5 days
- Analgesia, *see Section 24.1 page 196*
- **Amoxycillin** 500mg every 8 hours for 5 days
    - Steam inhalations using **menthol** are advised

Children

- **Oxymetazoline 0.025%** 2 drops twice a day for not more than one week
- **Phenoxymethylpenicillin** 12.5 mg/kg/dose
- **Amoxycillin** 25 mg/kg/dose in exacerbations of chronic sinusitis and HIV positive children who are on cotrimoxazole prophylaxis.

Alternatively if penicillin hypersensitivity:

- **Erythromycin** 12.5 mg/kg/dose every 6 hours for 7 days

If pain or fever (>39˚ C) give:

- Analgesic/antipyretic treatment as required

4.3.4 Allergic Rhinitis

- Recurrent inflammation of the nasal mucosa due to hypersensitivity to inhaled allergens e.g. pollen, house dust, grasses and animal proteins.

Symptoms/Signs: blocked stuffy nose, watery nasal discharge, frequent sneezing often accompanied by nasal itching and irritation, conjunctival itching and watering, edematous pale gray nasal mucosa, mouth breathing, snoring at night.

- Exclude other causes such as infections, vasomotor rhinitis, over use of decongestants drops, side effects of antihypertensives and antidepressants.

Treatment

- Allergen avoidance
- **Cetrizine** 10mg daily for 3-5 days plus
- **Beclomethasone** nasal sprays

4.3.5 Pharyngitis

- Viral pharyngitisis a painful red throat without purulence. Respiratory viruses are a major cause.

Symptoms/Sign: sore throat and fever, diffuse congestion of the pharyngeal wall, uvula and adjacent tissues.

Treatment

- Antibiotics are not indicated
- Home made salt mouth washes or gargles for 1 minute twice daily

4.3.6 Tonsillitis

- Acute inflammation of the tonsils. The main organism implicated in the causation is beta-hemolytic streptococcal.

Symptoms/Signs: sore throat, difficulty and pain on swallowing, inflamed tonsils, multiple white spots on the tonsillar surface, and sudden onset of fever.

Treatment

- Warm salt gargles
- **Phenoxymethylpenicillin** 500mg, every 6 hours for 5 – 7 days

Alternatively

- **Erythromycin** 500mg, every 8 hours in Penicillin allergy
- Analgesia see *Section 24.1 page 196* on pain relief

4.4 ENT Emergencies

4.4.1 Anaphylaxis (anaphylactic shock)

Refer to Section 5.0 page 29

5.0 Emergencies

5.1 Shock

- Acute circulation failure resulting in inadequate tissue perfusion and cellular hypoxia, generally with a low blood pressure.

Causes

1. hypovolemic (haemorrhage, cholera, severe vomiting, diabetic ketoacidosis)
   - cold, clammy skin; weak pulse, tachycardia
2. cardiogenic (myocardial infarction)
   - signs of heart failure
3. obstructive (pericardial tamponade, tension pneumothorax)
   - raised JVP, pulsus paradoxus

4 distributive (sepsis, anaphylaxis)
   - fever, warm peripheries

5.1.1 Anaphylaxis (anaphylactic shock)

- This is a medical emergency in which seconds count
- Taking appropriate measures immediately may save a life
- It requires prompt treatment for laryngeal oedema, bronchospasm and hypotension
- It is most commonly precipitated by drugs, especially after parenteral administration including;
  - antibiotics
  - aspirin and other nsaids
  - antiarrhythmics
  - heparin
  - neuromuscular blocking drugs
  - injectable iron
  - vaccines
- It may also be caused by
  - insect stings (especially wasps and bees)
  - blood products and blood transfusions
  - certain foods e.g. eggs, cow's milk, nuts
- The priority is to give **Adrenaline** i/m
  - Determine and remove the cause

- Lie the patient down
- Keep the patient warm
- Elevate the patient's legs
- Maintain airway
- Give 100% oxygen if available

Treatment

- **Adrenaline** 1 in 1,000 05-1 ml i/m (children 0.0.1 ml/kg)
- **Adrenaline** 0.01 ml/kg (adults)
- Repeat as required (several times if necessary) every 10 minutes according to BP and pulse until improvement occurs
- **Sodium chloride** 0.9 % 20 mL/kg by i/v infusion over 60 minutes
- Start rapidly then adjust according to BP
- An antihistamine is a useful additional treatment given after adrenaline and continued for 24-48 hours to prevent relapse
- **Promethazine** 25-50 mg by deep i/m or , in emergencies, *slow* i/v, as a solution containing 2.5 mg/mL in water for injection
    - *Adults:* max 100 mg
    - *Children:* 6-12 years: 6.25-12.5 mg:
      1-5 years: 5 mg
- Repeat dose every 8 hours
- An i/v corticosteroid is of secondary value in initial management of anaphylaxis as its action is delayed but should be given in severe cases to prevent further deterioration:

*Adults***:**

- **Hydrocortisone** 200 mg by *slow* i/v push

Children:

< 1 year: 25 mg
1-5 years: 50 mg
6-12 years: 100 mg

- May be repeated as necessary

- Monitor pulse, BP, bronchospasm and general response/condition every few minutes
- If there is continuing deterioration or no improvement the following may be necessary:
- **Aminophylline** i/v as for asthma if bronchospasm persists (*see Section 16.2.1 page 137*)

- Ventilation and/or tracheotomy

If acidosis is severe (blood pH<7.1) after 20 minutes
*Treatmen*t

- Give **sodium bicarbonate** 50 mmol by *slow* i/v (appr. 100 mL of 4% solution)
- Monitor plasma pH

5.2 Management of Emergencies and Trauma in Children

- Triage all sick children soon when they arrive in hospital into three categories in order to identify:-

a) Those with emergency signs

Emergency signs include: obstructed breathing, severe respiratory distress, central cyanosis, signs of shock, coma, convulsions, severe dehydration

b) Those with priority signs

Priority signs{"3TPR MOB"}, tiny baby*,* very hot or very cold temperature, trauma or other urgent surgical condition, pallor severe*,* poisoning *,* pain, respiratory distress*,* restlessness *,* referral {urgent}*,* malnutrition, oedema of the feet*,* burns

c) Those who are non urgent cases

5.2.1 Emergency management:

- Assess the airway and breathing{A,B}
  - Does the child's breathing appear obstructed? If so open as follows
    - *If no trauma* – do chin lift, head tilt.
    - *If suspected trauma*- do jaw thrust.
  - Manage airway in choking by using back slaps, chest thrusts or Heimlich manoeuvre in an older child.
  - Is there severe respiratory distress i.e. tachypnoea ,recessions,nasal flaring.cyanosis etc
  - Oxygen therapy
  - Ventilatory support if not breathing and there are signs of life - use bag and mask.
- Assess circulation and level of consciousness
  - Check if the child's hand is cold if so
  - Check capillary refill time {apply pressure to the nailbed for 5 seconds and determine the time from the moment of release until total recovery of the pink colour} normal is <3 seconds.
  - If in shock manage as follows:

- Manage shock, coma and convulsions

  If unconscious

  - put on oxygen
  - check blood sugar
  - place in the recovery position.
- Assess and manage severe dehydration in a child with diarhoea

5.3 Management of convulsions in children

- Establish the cause and when convulsions are controlled, treat accordingly
  - In neonates convulsions are usually due to hypoglycemia, hypoxia or infection e.g. meningitis
- Always exclude hypoglycemia as cause especially in children. If blood sugar can not be checked, assume hypoglycemia and treat accordingly
  - See *Section 6.1.1 page 36* for treatment of this in children
  - Hypoglycaemia is defined as <2.5 mmol/l or 3 mmol/l in severely malnourished children.
- For persistent convulsions, see *Section 5.2 page 31*

General measures

- Ensure airway is clear
- Do not place any object which might be swallowed in the mouth of a convulsing child
- Protect patient from injury and put in lateral position

Flow chart for controlling convulsions

- To control the fit

  A- Airway: place in recovery position
  B- Breathing: support with oxygen if necessary
  C- Circulation: treat shock
  D- Don't
  E- Ever
  F- Forget
  G- Glucose (correct hypoglycaemia with 2ml/kg of 25% **Dextrose** or 2.5ml/kg of 20% dextrose or 5ml/kg of 10% dextrose)

- If the fit has been going on more than 5 minutes

↓

Diazepam
0.5mg/kg rectal or 0.25mg/kg

- If fit still ongoing after 10 minutes or has recurred

↓

Diazepam 0.5mg/kg rectal
or 0.25mg/kg i/v

- If fit still ongoing after 10 minutes or has recurred

↓

Paraldehyde 0.2ml/kg i/m
or 0.4ml/kg rectal

- If fit still ongoing after further 10 minutes or has recurred, inform senior health worker

↓

Phenobarbitone
10–15mg/kg i/m or i/v

- If fit still ongoing after further 5 – 10 minutes or in status epilepticus

Discuss with seniors +/- anaesthetist
For **Phenytoin** administration 18mg/kg i/v infusion over 30 minutes. Give maintenance dose 2.5-5mg/kg over 30 minutes twice daily

Note:

1) It is not recommended to give diazepam intramusculary
2) Rectal administration may be quicker and easier than i/v in fitting child. Use a syringe with the needle removed.
3) For paraldehyde use a glass syringe preferably. If not available, use a plastic syringe instead but ensure that the dose is given promptly and therefore remains in the syringe for a short time (paraldehyde dissolves plastic)
4) For neonates, use **Phenobarbitone** 15-20mg/kg loading dose and maintenance dose of 2.5-5mg/kg once daily.

5.4 Diabetic ketoacidosis (DKA)

- Persons at extra risk: known insulin-dependent diabetics with poor compliance, intercurrent infection, failure to administer insulin when ill and not eating
- Investigate immediately blood sugar; urine dipstick for glucose and ketones, electrolytes and urea if possible
- Hypoglycaemia, subdural haematoma (elderly), stroke, malaria, meningitis, sepsis may also precipitate DKA
- If blood sugar levels cannot be obtained, it may be difficult to distinguish clinically between hypoglycaemic and hyperglycaemic coma; in that case give 50 ml 50% dextrose stat: in case of hypoglycaemia, it will wake the patient up; in case of hyperglycaemia, it will do no harm

Treatment

- Fluids – use large bore cannula; if possible set up 2 cannulae
    - In case of hypovolaemia i.e. blood pressure < 90 mm Hg or postural drop of blood pressure > 20 mm Hg
    - Give 4 litres **Sodium chloride 0.9%** in the first hour
    - In case of no hypovolaemia i.e. good urine output, normal blood pressure
    - Give 2 litres **Sodium chloride 0.9%** in the first hour
- In both cases after one hour give 3 litres /24 hours + amount lost in urine (see sliding scale for type of fluid)
- If still dehydrated after first hour, give 2 litres sodium chloride per hour and review
- Potassium chloride 10 mmol per litre (0.75mg) in each litre until i/v fluids are stopped

Note: Do not give potassium chloride with the first litre of sodium chloride.

- Give 10U **Soluble insulin** i/m stat, thereafter give insulin i/m according to sliding scale every 2 hours
- Check blood sugar every 2 hours

5.5 Hyperosmolar non-ketotic coma (HONK)

- Persons at risk: elderly with non-insulin dependent diabetes

Signs: confused / reduced consciousness (any reason e.g. stroke or infection)

Treatment

- Fluid replacement is more important than insulin even if blood sugar is high; however fluids should not be given too rapidly to avoid large electrolyte shifts.

  - Give 2 litres **Sodium chloride 0.9%** in the first hour, then 1 litre every hour. Adjust to slower rate if elderly patient with risk of heart failure.
  - Change to **Dextrose 5%** when blood sugar approaches normal levels.
- Give 10U **Soluble insulin** i/m stat; this is usually enough.
  - Do not try to lower the blood sugar rapidly at all cost by giving high doses of insulin.
- **Add Potassium chloride** as indicated in *Section 5.2 page 31*.
- Adjust / individualize insulin treatment when fully conscious and eating

Table 3: Sliding scale for insulin dosage based on blood sugar taken 2 hourly

Blood Glucose	Dose soluble insulin (i/m)	Type of fluid
HHH (very high)	10 units	Sodium chloride 0.9%
>400mg/dL (22mmol/L)	10 units	Sodium chloride 0.9%
300 – 399 mg/dL (16.5 – 22mmol/L)	10 units	Sodium chloride 0.9%
200 – 299mg/dL (11 – 16.5mmol/L)	5 units	Sodim chloride 0.9%
<200mg/dL (11mmol/L)	5 units	Dextrose 5%

6.0 Endocrine disorders

6.1 Diabetes Mellitus

- The diagnosis of diabetes is based on 2 abnormal blood sugar measurements (FBS > 7 mmol/l, 126 mg/dl *or* RBS >11mmol/200 mg/dl) in an asymptomatic patient or 1 abnormal measurement if the patient has symptoms of hyperglycaemia.

General Measures

- Establish treatment aims: some patients require strict glycaemic control with near normal glucose values targeted, for others symptom control and avoiding severe side effects of treatment may be the maximum achievable.
- Check BP regularly and aim for BP <130/80 mmHg *see Section 2.3 page 9*
- Discourage smoking
- Educate about foot care and screen annually for foot problems (neuropathy or peripheral vascular disease)
- Screen annually for decrease in visual acuities, look for cataracts

  Refer for specialist opinion if:
  - Pregnant diabetic
  - Acutely ill diabetic, particularly if vomiting or decreased Glasgow Coma Score (GCS)
  - Treatable complications e.g. cataracts

Treatment

- Give **Aspirin** 75mg daily to hypertensive diabetics aged over 50
- If a diabetic is admitted unconscious always consider the possibility of hypoglycaemia- administer 100ml 20% or 50ml 50% **dextrose/glucose** i/v even if a blood glucose measurement is not available.

6.1.1 Diabetes type 1 (Insulin dependent)

- Most children will have type 1diabetes.
- Children with diabetes should be referred for proper management and treatment.
- These children need to be followed up every 3 months to monitor blood sugars and long term complications of diabetes

6.1.1.1 Adults with no ketoacidosis or other acute complication:

Treatment

- **Lente/Protophane Insulin** 2 doses daily

- To decide the starting dose of Insulin:
  - The total daily number of Insulin units will be approximately half the patients body weight, e.g. for a 60 Kg person give 30 units **Insulin/**day divided into 2 doses
  - Then give 2/3 daily dose half an hour before breakfast, give 1/3 daily dose half an hour before evening meal, preferably 12 hours apart
  - Adjust Insulin dose according to fasting blood sugar (FBS) or 2 hours post-prandial blood sugar or symptoms of hypo- or hyperglycaemia
- **Metformin** 500mg twice daily can be added to Insulin treatment to improve glycaemic control and curb weight gain in adult diabetics

  Note*:* Insulin requirements can go *up* when a patient is acutely ill, even if they are not eating. NEVER stop Insulin in a type 1 diabetic.
- **Diet:**
  - Increase fibre intake
  - Reduce refined sugar intake
  - Insulin treated patients require 3 meals a day containing complex carbohydrate to avoid risk of hypoglycaemia
  - Advise patients to eat more before unaccustomed exercise

6.1.1.2 Children with diabetic ketoacidosis

Signs and symptoms: vomiting, polyuria, dehydration, ketonuria and acidosis. The blood sugar will be high >15mmol/l

- Address airway and breathing
- i/v fluids are the most important resuscitation measure
  - Give 20mls/kg bolus of **normal saline** or **ringer's lactate** if in shock
  - If not in shock give maintainance plus deficit over 24 hours if patient is conscious or over 48 hours if unconscious.
  - Maintainance requirements are as follows:
    - First 10 kg body weight 100mls /kg /day
    - Next 10 kg body weight 50mls/kg/day
    - Each kg thereafter 20mls/kg /day.
- Add **potassium chloride** to i/v fluids (20 - 40 mmol/litre) when patient urinates and peripheral circulation has improved
- Give subcutaneous injection of short acting **soluble insulin** 6 hourly.

6.1.2 Diabetes type 2 (Non Insulin-Dependent)

- Adjustment of diet and/or weight reduction (if obese) and increased exercise may control blood glucose without the need for drug therapy.
- Wherever possible give a 4-6 week trial of diet before introducing oral hypoglycaemic agents. If this is unsuccessful,

Treatment

- **Metformin** 500mg twice daily, increased to a maximum of 1g twice daily.

Note: (1) Metformin is the drug of choice in type 2 diabetes, particularly in obese patients.

(2) It is contra-indicated in renal insufficiency, and severe respiratory and cardiac disease due to risk of lactic acidosis.

- If glycaemic control still poor, add **Glibenclamide** 5mg daily, increasing to a maximum of 10 mg twice daily

Note: 20% of type 2 diabetics eventually require Insulin treatment - use principles as in type 1diabetes to initiate treatment. Use **Lente** 0.3U/kg bodyweight to start with.

6.2 Thyroid disorders

6.2.1 Hyperthyroidism

Causes: Graves disease, toxic multinodular goiter, toxic solitary nodule

Signs and symptoms: fatigue, nervousness or anxiety, weight loss, palpitations, heat insensitivity, tachycardia, warm moist hands thyromegaly and tremor.

- Management should be supervised by a doctor
- Refer to tertiary level

Treatment

Adults

- **Propranolol** 40-120mg three times daily to control symptoms, especially tachycardia
- **Carbimazole** 40mg daily for approximately 2 months then reduce dose to 10mg od
  - In Graves disease continue for 18 months then stop (in large percentage hyperthyroidism will be resolved)
  - In other causes continue carbimazole and refer for surgery

Children

- **Carbimazole** 0.5 mg/kg once daily oral.
- **Atenolol** 1-2 mg/kg orally as a single daily dose.
- *Refer for surgery if*
    - Relapsed Graves disease after carbimazole treatment
    - Toxic nodule or toxic multinodular goitre

  Note: If a patient develops a fever or sore throat while taking carbimazole, neutropenia should be urgently excluded. If present then stop Carbimazole and treat with antibiotics.

6.2.2 Hypothyroidism (Myxoedema)

- Management should be supervised by a doctor
- Refer to tertiary level

Treatment

- **Thyroxine** 100-150mcg (mcg) daily for life
- Elderly patients start with 25mcg then increase by 25 - 50mcg every 2 weeks up to 100mcg

6.2.2.1 Congenital Hypothyroidism

- Congenital hypothyroidism is one of the common treatable causes of preventable mental retardation in children.
- Congenital hypothyroidism must be treated as early as possible to avoid intellectual impairement.

Signs and symptoms: Prolonged jaundice, feeding difficulties, hypotonia, wide open fontannelles, oedema, constipation, enlarged tongue, dry skin, bradycardia, lethargy etc.

Treatment

- **Levothyroxine** 10-15 mcg/kg orally as a single daily dose for neonates and infants and 100 mcg/kg once daily
- Requires urgent referral for confirmation of diagnosis

6.2.3 Iodine deficiency disorders (Endemic goitre)

- More common in highland areas
- Much less likely since the introduction of iodised salt
- Only consult surgeons for treatment if large goiter causing obstructive problems or cosmetically unacceptable.

Prophylaxis

- **Aqueous iodine oral solution** 130mg/ml single dose
- Repeat every 2 years

7.0 Gastro-Intestinal Conditions

7.1 Amoebiasis

- Give health education on feacal disposal, hand-washing and food hygiene
- Consider in dysentery unresponsive to antibiotic treatment

7.1.1 Intestinal (non-invasive) form

Treatment

Adults

- **Metronidazole** 800mg every 8 hourly for 5 days preferably after food

Children

- **Metronidazole** 7.5 mg/kg/dose every 8 hours for 5 days

7.1.2 Hepatic form (amoebic liver abscess)

Treatment

Adults

- **Metronidazole** 800mg every 8 hours for 10 days
  - Give orally (preferably after food) or i/v (depending on the condition of the patient)
  - If necessary, repeat treatment course after 2 weeks
- Consider aspiration in cases of large abscesses or superficial abscesses under ultrasound guidance.

Children

- **Metronidazole** 10 mg/kg**/**dose every 8 hours for 10 days
  - Give orally (preferably after food) or i/v (depending on the condition of the patient).
- If necessary, repeat course of treatment after 2 weeks

7.2 Bacillary dysentery

- If the only symptom is dehydration, give health education on hand-washing (the single most important preventive measure), correct faeces disposal, and food hygiene
- Ensure complete hygienic precautions by all in contact with the patient
- Isolate the patient if possible
- Investigate source of contamination and inform environmental health authorities

- Use antibiotics only if the patient is systemically unwell or septic or immunosuppressed

Treatment

Adults

- **Ciprofloxacin** 500 mg twice a day for 5 days
- Analgesic *see Section 24.1 page 196*

Children > 3 months

- **Nalidixic acid** 50 mg/kg daily in 2-4 divided doses

7.3 Cholera

- Rehydration is of prime importance
- Ensure complete hygienic precautions by all in contact with the patient, who should be isolated if possible
- Investigate source of contamination, and inform environmental health authorities
- Trace close contacts and give antibiotics in the same doses as below
- Main treatment is by rehydration but antibiotics can shorten the diarrhoea episode and are therefore indicated.

Treatment

Adults

- **Doxycycline** 300 mg stat

Alternatively in pregnancy and children <5years:

- **Erythromycin** 250 mg every 6 hours for 3 days

Children >5 years:

- **Erythromycin** 12.5 mg/kg/dose every 6 hours for 3 days

7.4 Constipation

- Investigate and treat any identified cause
- Commonly related to inadequate dietary fiber intake and/or psychological factors
- Advise high residue diet, e.g. papaya seeds and increased fluid intake
- Reserve medication for severe cases only confirmed by examination.

All laxatives are contraindicated if intestinal obstruction is suspected

- Do not use oral laxatives in children.

- If increased fiber and oral fluids are insufficient to cure constipation and a laxative is considered necessary use **liquid paraffin 5-10 mls** daily.
- Refer all infants with constipation for specialist assessment
- Constipation in the neonate is usually due to a significant underlying problem such as bowel atresia or Hirschsprung's disease.
- *If a neonate has not passed stools in the first 48 hours of life:*
- Refer urgently for surgical and/or pediatric assessment

Treatment

Adults

- **Bisacodyl** 5-10mg at night

Alternatively

- Insert one glycerol suppository at night, moisten with water before insertion.

If no response within 3-5 days:

- Refer for further management

Note: For hemorrhoids, anal fissure and other causes of persistent anal pain in adults:

Insert one **Bismuth subgallate** suppository rectally each night and morning after defecation

7.5 Diarrhoea

7.5.1 Acute Diarrhoea

- Replace fluid and electrolyte loss
- Maintain optimal hydration
- Establish and treat causal factors
- In adults with acute diarrhoea who are systemically unwell and/or have fever, **Ciprofloxacin** 500 mg every twelve hours may be considered if the patient is (suspected to be) HIV infected
- In children, if i/v fluid is indicated but is impossible to administer, consider using the intra-osseus routes

Treatment

- Give low osmolarity WHO **ORS** as soon as the patient's condition improves
- Measurement of BP and pulse may help in assessment of dehydration.

7.5.1.1 Use of drugs in children with diarrhea

- Only use antibiotics for dysentery and suspected cholera cases with severe dehydration
- Use **Zinc** 20mg per day for 10 days (>6month) or 10mg per day for 10 days (<6month) in addition to low osmolarity ORS
- Only use antiparasitics for:
  - Amoebiasis, after antibiotic treatment of bloody diarrhea for shigella has failed or trophozoites of *E.histolytica* containing red blood cells are seen in the faeces.
  - Giardiasis, when diarrhea has lasted at least 14 days and cysts or trophozoites of *Giardia* are seen in faeces or small bowel fluid

Antidiarrhoeals and antiemetics should never be used in children with acute diarrhea because they have no proven value and may be dangerous

7.5.1.2 Assessment of patients for dehydration

	A	B	C
Look at -condition -eyes -tears -tongue, mouth -thirst	Well, alert Normal Present Moist Not thirsty Drinks normally	Restless/irritable* Sunken Absent Dry Thirsty Drinks eagerly*	Lethargic/unconscious: floppy* Very weak sunken and dry Absent Very dry Drinks poorly or not able to drink*
Feel Skin pinch	Goes back quickly	Goes back slowly	Goes back very slowly*
Decide	NO SIGN OF DEHYDRATION	If the patient has 2 or more signs including at least one sign*: SOME DEHYDRATION	If the patient has 2 or more signs including at least one sign* SEVERE DEHYDRATION
Treat (see below)	Use Plan A	Weigh if possible Use Plan B	Weigh the patient Use Plan C URGENTLY

Note: in severely malnourished children, skin turgor is not a reliable sign.

7.5.1.3 Treatment Plan A (to treat diarrhea at home)

- Use this plan to teach the mother to continue to treat her child's current diarrhea at home and to give early treatment for any future diarrhea.
- Explain the 3 rules for treating diarrhea at home:
    1. **Give child more fluids than usual to prevent dehydration**
        - Suitable fluids include: Low osmolality ORS, plain water, food-based fluids (e.g. gruel, soup, rice water), breast milk, milk feeds prepared with twice the usual amount of water.
        - Give **ORS** if the child has been on Treatment Plan B or C or cannot return to the health worker if the diarrhea gets worse
            - Give ORS or water rather than a food-based fluid if the child is under 6 months old and not yet on solid foods
            - Give as much of these fluids as the child will take
            - Use the amount shown below for ORS as a guide
            - Continue giving these until the diarrhea stops

Special notes for severely malnourished children

- Dehydration tends to be overdiagnosed and its severity overestimated in severely malnourished children because it is difficult to assess dehydration in severely malnourished children using clinical signs alone.
- Do not use i/v route for rehydration except in cases of shock.
- In shock give **oxygen**, keep the child warm, establish i/v access and infuse 15mls/kg over 1 hour of ½ **Strength Darrows with 5 % dextrose** or **Ringers lactate with 5% dextrose**.
- The child needs to be observed closely and if the respiratory rate and pulse rate increases stop i/v fluids.
- If the child is improving but still shocked repeat the same volume of fluids over another hour thereafter switch to oral or nasal gastric rehydration with **ReSoMa**l alternatively with **F-75** for up to 10 hours.
- In severe dehydration give 5mls/kg of **Resomal** every 30 minutes for the first 2 hours then give 5-10ml/kg/hour for the next 4-10 hours which should be alternated with **F-75** at the usual volumes.

Table 4: Ingredients for home made ResoMal

Ingredient	Amount
Water	2 litres
WHO ORS	One 1 litre packet
Sugar	50 g
Electrolyte/mineral solution	40mls

- In mild diarrhea without dehydration, prevent dehydration developing by continuing milk feeds – ReSoMal is not necessary in these cases.
- Monitor carefully and frequently
- Watch for signs of heart failure due to over hydration which is common in children with kwashiorkor.

---

2. Give the child plenty of food to prevent malnutrition

- Continue to breast-feed frequently

If the child is not breast-fed:

- ➢ give the usual milk feed

If the child is 6 months or older or already taking solid foods:

- ➢ also give cereals or another starchy food
  - mix, if possible, with pulses, vegetables, and meat or fish
- ➢ add 1-2 teaspoonfuls of vegetable oil to each serving
- ➢ give fresh fruit juice or mashed banana to provide potassium
- ➢ give freshly prepared food
  - cook and mash or grind food well to make it easier to digest
- ➢ encourage the child to eat
  - offer food at least 6 times daily
- ➢ give the same food after the diarrhea stops
- ➢ give one extra meal daily for 2 weeks

3. Take the child to the health worker if the child does not get better in 3 days or develops any if the following:

- o many watery stools
- o repeated vomiting
- o marked thirst
- o eating or drinking poorly fever
- o blood in the stool

- If the child will be given ORS at home, show the mother how to mix ORS and how much to give after each loose stool (see table over)
- Give enough packets for 2 days treatment

Age (years)	Amount of ORS to give after each loose stool*	Amount of ORS to provide fro use at home
Under 2	50-100 ml	500 ml per day
2-10	100-200 ml	1 L per day
Over 10	As much as wanted	2 L per day

* Describe and demonstrate the correct amount to be given using a locally available measure, e.g. cup or coke bottle

Show the mother how to give ORS:

For a child <2 years:

- give a teaspoon every 1-2 minutes

For an older child:

- give frequent sips from a cup

If the child vomits:

- wait 10 minutes, then give ORS more slowly

If diarrhea continues after the ORS is used up:

- tell the mother to give other fluids as described in rule 1 above or to return for more ORS

Explain how to prevent diarrhea in child:

- give only breast milk for the first 4- 6 months and continue to breastfeed for at least the first year
- introduce clean, nutritious weaning foods at 4- 6 months
- give the child freshly prepared and well-cooked food and clean drinking water
- make sure all family members wash their hands with soap after using the toilet, and before eating or preparing food
- quickly dispose of the stool of young children in a latrine or by burying

7.5.1.4. Treatment Plan B (to treat dehydration)

1. Give ORS solution for the first 4 hours:

Weight (kg)	Amount (mL)
Under 5	200-400
5-8	400-600
8-11	600-800

11-16	800-1,200
16-30	1,200-2,200
Over 30	2,200-4,000

- Encourage the mother to continue breast-feeding
- Give more ORS if the patient wants it
- For infants under 6 months who are not breast-fed, also give 100-200 ml of clean water during this period
- Observe the child carefully and help the mother give ORS solution:
  - show her how much solution to give the child
  - show her how to give it (see Plan A)
  - sheck from time to time to see if there are any problems

If the child vomits:

- wait 10 minutes
- then continue with ORS, but more slowly

If the eyelids become puffy:

- stop ORS
- Give breast milk
- Give ORS again (as in Plan A) when the puffiness has gone

2. After 4 hours, reassess the child using the assessment chart. Choose a suitable treatment plan to continue

If there are no signs of dehydration:

- use **Plan A**. When dehydration has been corrected the child usually passes urine and may also be tired and fall asleep

If signs showing some dehydration are still present:

- repeat **Plan B**, but start to offer food, milk and juice as described in Plan A

*If signs of **severe dehydration** have appeared:*

- change to **Plan C**

If the mother must leave before completing Plan B:

- show her how much ORS to give to finish the 4 hour treatment at home
- give her enough ORS packets to complete rehydration and for 2 more days as shown in Plan A
- show her how to make the ORS solution
- explain to her the 3 rules in Plan A for treating the child at home

7.5.1.5. Treatment Plan C (to treat severe dehydration quickly)

1. Start i/v fluids immediately

- If patient can drink, give ORS by mouth while the drip is set up
- **Intra-ossueus route:** if unable to get an i/v line in quickly, consider using this useful method of rehydration fluid administration if familiar with the technique:
- If an intra-osseus needle is not available, use a 21G hypodermic needle or a large bore LP needle instead
- **Ringer's Lactate** 100 ml/kg divided as in the table below

Alternatively if not available

- **Normal saline**

Note: Both of these i/v solutions do not contain glucose and are thus not suitable for long-term i/v fluid therapy in children – use **Darrow's ½ strength + dextrose 5%** instead

Table 5: Rate of administration of i/v rehydration fluid

Age	First give 30 ml/kg in:	Then give 70ml/kg in:
<12 mths >12 mths	1 hour * 30 minutes*	5 hours $2^1/_2$ hours

* Repeat once if radial pulse is still very weak or undetectable

Alternative method of i/v rehydration fluid administration

- May be useful where the above schedule is difficult to follow on a busy ward
  - give 10 ml/kg of the i/v fluid as a bolus given over 5 minutes using a syringe
  - then give 100 ml/kg as an infusion over a further 6 hours

With either method:

- reassess the patient every 1-2 hours

If hydration is not improving:

- give the i/v fluid more rapidly
- also give **ORS** (approx. 5 ml/kg/hour) as soon as the patient can drink – usually after 3-4 hours (infants) or 1-2 hours (older patients)
- after 6 hours (infants) or 3 hours (older patients), evaluate the patient using the assessment chart
- then choose the appropriate Plan A, B or C to continue treatment

If i/v therapy cannot be given, but is available within 30 minutes:

- send the patient immediately for i/v treatment

If the patient can drink:

- provide the mother with ORS solution
- show her how to give it during the trip

If i/v therapy cannot be given and is not available nearby, but nasogastric therapy is available:

- start rehydration by nasogastric tube with **ORS** solution
    - give 20 ml/kg/hour for 6 hours (i.e. a total of 120 ml/kg)
- reassess the patient every 1-2 hours
- if the child has malnutrition, give half this amount

If there is repeated vomiting or increased abdominal distention:

- give the fluid more slowly

If hydration is not improving after 3 hours:

- refer for i/v therapy
- reassess after 6 hours
- choose the appropriate treatment plan to continue treatment

If both i/v and nasogastric therapy are not available, but the patient can drink:

- start rehydration by mouth with **ORS** solution
- give 20 ml/kg/hour for 6 hours (i.e. a total of 120 ml/kg)
- re-assess the patient every 1-2 hours

If there is repeated vomiting;

- ➢ give the fluid more slowly

If hydration is not improving after 3 hours:

- refer for i/v therapy
- reassess after 6 hours
- choose the appropriate treatment plan to continue treatment

If i/v and nasogastric therapy are not available and the patient cannot drink:

- ➢ refer *urgently* for i/v or nasogastric therapy
- If possible, observe the patient at least 6 hours after rehydration to be sure the mother can maintain hydration with **ORS** solution by mouth
- If the patient is under 2 years old and there is cholera in the area, treat for this (see *Section 7.3 page 41*) after the patient is alert

7.5.2. Chronic diarrhoea (adults)

- Defined as liquid stools for 3 or more times daily or episodically for over 1 month
- Common presentation in HIV/AIDS patients.

Treatment

Adults:

- Correct any dehydration and maintain hydration
- Consider **potassium supplements**
  - Advice the patient to eat more potassium-rich foods if possible, e.g. bananas, Oranges, tangerines, and other citrus fruits
- Give supplementary feeding when required/as tolerated
- Always do HIV test
- Investigate stool for presence of ova, cysts and parasites

➢ *If the condition persists*

Give **cotrimoxazole** 960mg every 12 hours for 7 days

➢ *If the condition responds to treatment but recurs within 4 weeks:*

- Re-treat in accordance with the initial response
  - Relapse may be due to short duration of initial treatment

- *If no response to cotrimoxazole within 3 days, or if no improvement after recurrence and retreatment with cotrimozaxole;*

- Give **metronidazole** 800 mg every 8 hours for 7 days

- *If improved after re-treatment;*

- Follow up as required

- *If still no response after adding metronidazole or if no improvement after recurrence and re-treatment with cotrimoxazole/metronidazole;*

- Give **albendazole** 400mg twice daily for 2 weeks

- *If still not improved after albendazole treatment;*

- Refer for microscopic examination of stool, *See note (d) below*
    - Multiple stool examination may increase the diagnostic yield of parasites if present

    a) *If bacteria or parasite found;*
        - Treat accordingly

        If the condition responds to treatment but recurs within 4 weeks:
            - Re-evaluate

    b) *If bacteria or parasite is not found, use a constipating agent to control the diarrhoea for up to 5 day*s treatment
        - Give **loperamide** 4mg initially then 2mg after each loose stool
        - Usual dose 6-8mg daily up to 16mg daily

        Alternatively
        - **codeine phosphate** 30mg every 6 hours

- *If still not improved within 1 week:*
    - Stop treatment
    - Re-evaluate
- *If no treatable cause of the diarrhoea is found*
    - Counsel the patient

Note:

a. Do **not** use constipating agents in patients with bloody diarrhoea because of the risk of inducing toxic megacolon
b. In persistent diarrhoea, perianal application of soft paraffin (Vaseline®) may soothe anal mucosae
c. Chronic diarrhoea caused by cryptosporidium infection and caused by HIV infection itself (HIV enteropathy) needs to be treated with antiretroviral therapy

7.5.3. Persistent diarrhoea (children)

- Defined as liquid stool 3 or more times daily for over 14 days
- A pathogen will only be identified in a small number of cases
- Consider TB and chronic infections e.g. UTI, as uncommon causes
- Persistent diarrhoea is a common symptom of protein-energy malnutrition (PEM) and will resolve with treatment of this
  - Correct any acute dehydration and maintain hydration
  - Maintain nutrition
    - Including breast feeding, where appropriate

Presence of fever and/or bloody stool makes bacterial infection more likely and malnutrition puts a child at increased risk of dying from persistent diarrhoea. Empiric (trial) antimicrobial treatment is therefore indicated in these conditions

  - *If bloody stool and fever:*
    - Give **Nalidixic acid** 50 mg/kg divided in 4 doses per day for 5 days
  - *If malnourished giv:*
    - **Cotrimoxazole** 24 mg/kg every 12 hours for 5 days and
    - Supplemental feeding and supplements
  - *If worsening, or not improving after 14 days:*
    - refer for microscopic stool examination
    - consider giving **Albendazole** for worms *(see Section 15.5 page 131)*
    - and/or give **Metronidazole** for giardiasis

7.6 Gastritis (Peptic Ulcer)

- Advise patient to avoid hot spices, alcohol, tobacco, carbonated drinks
- Encourage regular meals

Treatment

- Chew 2 **Magnesium trisilicate compound** tablets every 6 hours or more frequently as required for 7days
  - Take preferably before food
  - Take the last dose at night

Alternatively

- **Ranitidine** 300mg at night or 150mg every twelve hours for 4 weeks OR
- **Cimetidine** 400mg every twelve hours or 800mg at night OR
- **Omeprazole** 20mg once daily for 2 weeks

If severe pain continues:

- Exclude perforation

If no response, or in the presence of danger signs such as weight loss and haematemesis:

- Refer for endoscopy and further management e.g. with triple therapy
- In patients with gastric or duodenal ulcers give triple therapy for Helicobacter pylori:
  - **Omeprazole** 40mg once daily for 2 weeks
  - **Metronidazole** 400mg every 8 hours for 7 -10 days
  - **Amoxycillin 1g** every twelve hours for 7 – 10days

Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDS) e.g. indomethacin, ibuprofen, are contraindicated in patients with a history of peptic ulcer

7.7 Vomiting

- Always look for a possible cause and treat accordingly
- Do not give symptomatic treatment without knowing the cause
- Always exclude mechanical obstruction
- Correct dehydration where necessary

Treatment

- **Metoclopramide** 10 mg i/m or slow i/v (over 2 minutes) 3 times daily as required

Note: Patients less than 20 years require special caution. Observe dose requirements and use restrictions.

8.0 Hepatic Disorders

8.1 Acute liver failure

- Withdraw the causative agent if possible e.g. drugs or alcohol
- Avoid hepatoxic drugs e.g. paracetamol
- Ensure adequate intake of glucose (dextrose)
- Induce diarrhoea with **Lactulose** 5ml every 6 hours and/or **Neomycin sulphate** 1g every 6 hours (1 week)
- Give antibiotic prophylaxis for patients with liver failure: **Ceftriaxone** 2g od iv
- Prophylaxis of bleeding: **Vitamin K** 10 mg i/m stat

- *If the patient is drowsy or comatose*
    - Give an i/v infusion of dextrose 50%
    - Reduce protein intake
    - Do not give sedatives or hypnotics
    - Refer the patient for further diagnosis and management
    - **Thiamine** 100 mg i/v or i/m 3-7 days in case of known or suspected alcoholic cause

9.0 Infectious Diseases

9.1 HIV and related conditions

- People infected with HIV may develop HIV-related illnesses, the most common of which is TB.

In all cases of HIV-related illness, prompt diagnosis and proper management of the problem is crucial

- For more details refer to the following MoH guideline
- MoH **Management of HIV/AIDS Related Diseases (2008 2nd Edition)** for:
  - The Malawi AIDS case definition: *Clinical and laboratory diagnosis of HIV related diseases.*
  - Treatment of AIDS Guidelines for the Use of Antiretroviral Therapy in Malawi 3rd edition.
  - PMTCT guidelines

9.1.1 Care and Support

- *General supportive care:* Proper nutrition is important.
- *Psychological support:* Inform patients of any HIV support groups in their community.
- *Spiritual support:* The spiritual needs of the patient and family should be properly addressed.

9.1.2 Immunisation of HIV (+) children

- Unless very ill, immunise with EPI vaccines (BCG, DPT, polio and measles) according to standard schedules *see Section 19 page 167*.
- Older children with clinical AIDS should not get BCG vaccine.
- Antibody response to vaccines may be less than normal but tends to be better in the early stages of HIV infection.

9.1.3 Breast-feeding by HIV (+) mothers

- Counsel HIV (+) women on the risks of future pregnancy
- Encourage Exclusive breast feeding up to 6months.

9.1.4 End organ dysfunction

- These include:
  - Bone marrow (haematological abnormalities): see section on blood diseases
  - CNS
  - GI, renal, cardiac systems
- For organ dysfunction directly caused by HIV, ART is indicated in combination with supportive treatment

9.1.5 Counselling

- Refer to the **MoH** ***Guide for Pre- and Post-test Counselling and AIDS Counselling information.***
- If a child is too young, counsel the parents/guardians.
- Counselling should be private, compassionate and confidential.
- Consider modes of transmission in discussions with parents or guardians.
- Offer HIV testing to parents of HIV-infected children, and advise them on:
  - The implications of HIV infection in themselves for further children.
  - The risk of transmitting infection sexually or as blood donors in the future.

9.1.5.1 Pre-test counselling

- Refer to the **MOH** ***Guide for Pre- and Post-test Counselling and AIDS Counselling information***.

9.1.5.2 Post-test counselling

- Refer to the **MOH** ***Guide for Pre- and Post-test Counselling and AIDS Counselling information.***

9.1.6 Health worker safety

- Refer to the MOH/National Prevention Services booklet ***Recommended Guidelines for Infection Control and Prevention***

9.1.7 Post-exposure prophylaxis (PEP)

- "**PEP**" refers to the treatment of HIV exposures using antiretroviral drugs.
- ART started immediately after exposure to HIV may prevent HIV infection.
- Treatment should be initiated within 1-2 hours of injury or exposure. Where this is not possible, it is still reasonable to start PEP up to 72 hours after the exposure.
- An exposed client should receive PEP only if he or she is HIV negative, because PEP is not nessecary if the client is HIV infected and dual antiretroviral therapy is potentially harmful (as it can easily induce resistance).
- PEP may be given regardless of the serostatus of the source if there is a possibility that the source may be in the window period of seroconversion.

Table 6: ***The PEP Regimen***

Medicine	Dose	Frequency	Duration
Zidovudine (AZT) 300mg/ Lamivudine (3TC) 150mg (Duovir)	One tablet	Twice a day	30 days

9.1.8 HIV infection in children

- *Common presentation:* diarrhoea, failure to thrive (FTT) and infections including tuberculosis, thrush (moniliasis), pneumonia, and meningitis;
  - Treat these and malnutrition appropriately.
- Immunise HIV(+) children with DTP, hepatitis B, Hib, polio, and measles vaccines, unless they are very ill but,
- Do not give BCG to older children with clinical AIDS.
- Encourage mothers to continue breast feeding.
- Whenever possible, treat HIV(+) children as out-patients to minimise the risk of cross-infection, as they may be immuno-compromised.

  Note: A reactive HIV ELISA test in a child under 18 months, even with no laboratory error, is not proof of HIV infection, as passively acquired maternal antibody may be the cause

9.1.9 Management of common clinical presentations in HIV (+) patients

- Treatment of these is often similar to the treatment of the same condition in HIV(-) patients, as covered elsewhere in these guidelines.
- Differences in treatment for HIV(+) patients are indicated in the appropriate treatment schedules.

9.1.9.1 Diarrhoea disease

See *Section 7.5 page 42*.

9.1.9.2 Respiratory conditions (adults)

- *Common HIV associated respiratory diseases:* bacterial pneumonia, pulmonary tuberculosis, Pneumocystis jirovecii pneumonia (PCP), lymphoid interstitial pneumonitis (LIP), pulmonary Kaposi's sarcoma.
- Cough without dyspnoea or tachycardia and associated with a runny nose is usually indicative of a viral URTI.

9.1.9.3 Pneumocystis jirovecii Pneumonia (PCP)

Treatment

- **Cotrimoxazole** oral or i/v 30 mg/kg every 8 hours for 21 days
- Whereever possible give oxygen
- Give severely dyspoenic patients **Prednisolone** 40mg twice a day for 5 days then 40mg once a day for 5 days then 20mg once a day for the remaining 11 days
- Risk of recurrence after treatment is very high. For prophylaxis give **Cotrimoxazole** 960mg twice a day

9.1.9.4 Respiratory conditions (children)

- Cough with or without difficulty in breathing.
- Pneumonia and pulmonary TB are common in HIV (+) children.
- Cough without dyspnoea or tachypnoea and associated with a runny nose is usually due to a viral URTI.

Treatment

- *if upper respiratory tract infection (URTI) with fever:*treat as malaria, (*see Section 15.1 page 118)*
    - *if URTI without fever:* Advise mother on general supportive home care (*see Section 16.1 page 132)***.**

- *if pneumonia suspected:*assess severity and treat according (*see Section 16.1 page 132)*.
- Presumed pneumonia which fails to respond to treatment may be due other causes
    - Do a chest X-ray to rule out emphysema, effusion, TB, PCP, LIP, staphylococcal infection and other conditions common in HIV(+) patients
    - Manage according to X-ray findings
- *If PCP found, treat as in Section 9.1.9.3 above*
    - Give **Prednisolone, 1-2mg/kg** every 12 hours
- *If LIP found:*
    - Suspect LIP if chest xray shows a bilateral reticular –nodular interstial pattern. Distinguish from pulmonary TB.
    - The child may present with persistent cough, bilateral parotid swelling, persistent generalized lymphadenopathy, hepatomegaly and finger clubbing.
    - Antibiotics for bacterial pneumonia
    - **Prednisolone 1-2mg/kg** daily for 2 weeks,
        - Decrease dose over 2-4 weeks depending on response.
    - Beware of reactivation of TB

9.1.9.5 Fever (adults)

- A body temperature of over 38^{o} C, continuously or intermittently, for more than 24 hours in any 72 hour period.
- Fever is common in HIV(+) patients

Seriously ill patient

- Start treatment for presumed sepsis (*See Section 9.7 page 87)*
- Maintain hydration
- Refer urgently to hospital for further management

If patient not seriously ill

- Maintain hydration
- Check bloodslide for malaria parasites, whether positive or negative: give presumptive 1st line antimalarial treatment (*see Section 15.1.1 page 119**)***

- Look for local causes of fever: otitis media, tonsillitis, skin infections, pneumonia, PTB and EPTB, urinary tract infections, joint infections and give appropriate treatment accordingly
- Consider giving antipyretic treatment
- *If not improved within 3 days:*
    - Refer for further investigations
    - Treat according to findings
- *If there are no suggestive laboratory or radiological findings:*
    - consider empirical (trial) treatment for suspected sepsis (*see Section 9.7 page 87)*
- *If fever still persists but patient is clinically stable:*
    - Presume HIV related fever
    - Give supportive care and assess for ART
    - Seek a second opinion at the earliest opportunity

9.1.9.6 Fever, persistent or recurrent (children)

- Persistent fever: a body temperature of >38 degrees Celcius for more than 5 days
- Recurrent fever: a body temperature of >38 degress celcius for more than 1 episode in a period of 5 days
- Look for: Meningitis, septicemia, Occult bacterial infections, TB, Fungal, viral or parasitic infections, Neoplasms
- Maintain hydration
- Maintain nutrition
- Give antipyretic treatment (*see Section 10.1 page 91)*

Treatment

Seriously ill child

- Start treatment for presumed sepsis (*see Section 9.7 page 87)*
- Start 1st line antimalarial treatment (*see Section 15.1.1 page 119)*
- Refer the patient.

Child not seriously ill

- *If the child has completed 1st line antimalaria treatment:*
    - **Amoxycillin 50mg/kg** every 8- 12 hours for 7 days.
    - This is intended to treat non-serious bacterial infections, e.g. sinusitis, urinary tract.
- *If free of fever after 3 days:*
    - Complete treatment course for **Amoxycillin**.

- Follow up as required.

- *If not improved;*
  - Give 2nd line antimalarial treatment (*see Section 15.1.1 page 119).*
  - Follow up as required.
- *If the child has not completed 1st line antimalarial treatment*
  - give 1st line antimalarial treatment (*see Section 15.1.1 page 119)*
- *If not free of fever after 3 days:*
  - Refer to the next level

9.1.9.7 Upper GIT Candidiasis

- Presumptive diagnosis:
  - white plagues in the mouth and lesions in the esophagus and stomach,
  - Antifungal therapy is required treat according to Oropharyngeal conditions (*see Section 14.1 page 113)*

9.1.9.8 Mental disorders (adults and older children)

- Refer to *Section 3.3 page 17* on psychological conditions

9.1.9.9 Primary neurological disorders (adults)

- Refer for careful assessment and investigation
- Refer to *Section 3.4 page 18* on neurology disorders

9.1.9.9.1 CNS disorders

- Look for evidence of an opportunistic infection and treat the underlying cause accordingly

9.1.9.9.1.1 Protozoal, viral, fungal and bacterial infections

- Often affects the brain in HIV (+) patients
- Carry out a lumber puncture
- Refer to relevant treatment guidelines

9.1.9.9.1.2 Cerebral toxoplasmosis

- Most frequently causes focal neurological signs in patients with advanced immune-suppression.
- **Sulphadoxine/pyrimethamine (SP)** 2 tablets daily for at least 6 weeks, followed by life-long cotrimoxazole 480mg twice daily.
- Start ART after some weeks on SP.

- May result in complete cure

9.1.9.9.1.3 Cryptococcal meningitis

- Refer to *Section 9.3.3 page 73*

9.1.9.9.1.4 Tuberculosis

- Refer to *Section 9.5 page 76*

9.1.9.9.1.5 Syphilis

- Refer to *Section 17.4 page 153*
- *If there is severe spasticity and ataxia:*
    - Presume myelopathy
    - Treat as neuro-syphilis with **Benzylpenicillin** 5 MU i/v 6 hourly for 2 weeks OR **Doxycycline** 200 mg once daily for 3 weeks
    - Give supportive and symptomatic treatment and counseling

9.1.9.9.1.6 AIDS Dementia

- Characterised by cognitive, behavioural and motor dysfunction, often overlooked in advanced HIV infection. ART is indicated and may give a favorable response.

9.1.9.9.1.7 Progressive multifocal leucoencephalopathy (PML)

- Caused by a papova (JC) virus, rapid evolution over weeks or months; altered mental state, visual defects, motor weakness, speech dysfunction, sensory deficits and cerebellar disorders.
- Prognosis is very poor, sometimes temporary relief from ART, no causative treatment available.

9.1.9.9.2 Peripheral nervous system conditions

If predominantly sensory: **sensory peripheral neuropathy**

- If on tuberculosis treatment, treat with **Pyridoxine** 25mg once daily for the duration of tuberculosis treatment
- Check if drugs that cause neuropathy are used (vincristine, stavudine, metronidazole) and consider modifying drug treatment
- Screen for diabetes mellitus and treat accordingly if present
- Consider other causes of neuropathy: alcohol abuse, renal disease, malignancies, vitamin B12 deficiency and treat if possible
- HIV associated peripheral neuropathy often improves with ART

- Give supportive and symptomatic treatment:
  - **Amitryptilli**ne 25-75mg nocte
  - Painkillers if required (*see Section 24.1 page 196*)

9.1.9.10 Primary neurological disorders (children)

- Manage these in the same way as in HIV (-) children.
- Refer to hospital for careful assessment and investigation.
- Rule out treatable causes of acute episodes of neurological dysfunction such as TB, bacterial meningitis and cerebral malaria through careful history and examination in children.

9.1.9.11 Lymphadenopathy

- *Causes:* Tuberculosis, bacterial (including syphilis), fungal or viral infections, malignancies (Kaposi's sarcoma, lymphoma), dermatological and other conditions.
- Persistent generalized lymphadenopathy (PGL), more than 3 separate lymph node groups affected, at least 2 nodes more than 1.5 cm in diameter at each site, duration of more than 1 month and no local or contiguous infection which might explain the lymphadenopathy
- Is common and due to HIV infection alone; requires no treatment

General Measures

- Ensure careful physical examination to identify any local or contiguous infection which might explain the lymphadenopathy.
- *If there is local or contiguous infection:*
  - Treat as indicated
- *If TB is suspected*
  - Do fine needle aspiration for acid fast bacilli. Treat accordingly (*see Section 9.5 page 76)*
- *If there is a papulo-squamous rash and/or evidence of recent genital ulcer (adults only)*
  - Do a TPHA or RPR

  If positive, treat for syphilis *see Section 17.4 page 153*
- *If the patient has recent symptomatic lymphadenopathy of uncertain aetiology or if patient does not respond to empiric therapy:*
  - Refer for further assessment including lymph node biopsy

9.1.9.12 Failure to thrive (FTT)

- This is seen by examining the child and checking the under-5 card

- When assessing FTT, it is vital to take a detailed dietary and social history to determine whether the child receives sufficient calories and a balanced diet
- Rule out TB and HIV
- Ascertain whether the child has any TB contacts
- Do chest x-ray and tuberculin PPD test, and also sputum test in an order child
- Tuberculin PPD testing is however usually unhelpful in severe FTT
- Identify any other associated problems and treat accordingly. These may include
    - Persistent Diarrhoea (*see Section 7.5.3 page 52)*
    - Oral thrush *(see Section 14.1 page 113)*
    - Respiratory conditions *(see Section 16 page 132)*
- Assess the severity of FTT
    - Inability to feed and severe apathy are important indicators of severity
    - Severe malnutrition is often associated with extensive oedema and dermatitis
- *If able to feed and not severely malnourished:*
    - Give a trial of home feeding
    - If possible, give exact recommendations on the schedule and content of the diet
    - Assess the availability of food at home
    - Encourage the mother to provide, whenever possible, a balanced nutritious diet including, for example soya, beans, groundnuts, bananas, other fruits, eggs, meat and fish
    - Review after 2-4 weeks
- *If TB is not found*
    - Carry out other investigations as indicated from history and examination e.g.
        - Stool analysis and urea and electrolytes
- *If neither TB or other conditions are identified*
    - Presume HIV-related FTT
- *If not able to feed and moderately or severely malnourished:*
    - Admit the patient
    - Treat for malnutrition *(see Section 23 page 188)*
- *If the child is taking adequate oral feeds*
    - Continue these for 2-3 weeks

    - Reassess the patient
- *If the child is unable to take adequate oral feeds, u*se NGT feeding until able to take oral feeds
- *Once the child is improving*
    - If aneamic, give **Ferrous Sulphate** and **Folic Acid**
    - If helminth infestation is suspected, treat with **Albendazole**
    - *If on re-assessment the child is not improving, refer to the higher level*
- *Where severe FTT is considered to be HIV-related*
    - Improve nutritional and supportive care
    - Prolonged NGT feeding may occasionally be appropriate
    - Initiate HAART

9.1.9.13 Pain relief

Refer to *Section 24 page 196*

9.1.9.14 Kaposi's sarcoma

- Kaposi's sarcoma (KS) patients need to be started on ART, as there is a direct beneficial effect on KS at whatever stage of disease patients present.
- Full blood count must be done before starting treatment

Treatment

- 2mg once a week for 6 doses
- Review after 6 weeks

  If there is'no effect' nor side effects and /or limited stable disease then discontinue

  If there is 'good effect' or minimal side effects and residual disease
    - *continue with* 2mg once every 2 weeks for six doses
- Review after 6 weeks

  If there is'no effect' nor side effects and /or limited stable disease then discontinue

  If there is 'good effect' or minimal side effects and residual disease
    - *continue with* 2mg once a month for six doses
- Final assessment of efficacy and side effects should be recorded in health passport for future reference
- Review after 3 months after treatment (earlier as required for pain and symptom management)

9.1.10 Antiretroviral Treatment Regimens

9.1.10.1 First Line regimen

- Introduction of the first line regimen includes:
  - Staging and management of HIV related diseases
  - Group counseling on issues surrounding ART
  - Individual counseling and assessment of contraindications for ART
  - Baseline weight
  - Other blood tests may be done (full blood count, CD4 count, creatinine, liver enzymes) but are not mandatory

Table 7: Steps in administering 1st line ARV Therapy

First two weeks(starter pack)	d4T/3TC/NVP 1 tablet in the morning plus d4T/3TC 1 tablet in the evening
Continuation pack	d4T/3TC/NVP 1 tablet in the morning plus d4T/3TC/NVP in the evening

9.1.10.1.1 Alternative First Line regimen

- Alternative first line substitutions can be made in cases of medicine reactions:
  - Severe peripheral neuropathy: due to stavudine component
    - ***Zidovudine (AZT)*** + **Lamivudine (3TC)** + **Nevirapine (NVP)**
  - Liver toxicity such as hepatitis: due to nevirapine component
    - **Stavudine (d4T)** + Lamivudine (3TC) + ***Efavirenz (EFZ)***
  - Severe skin reactions: due to nevirapine component
    - **Stavudine (d4T)** + **Lamivudine (3TC)** + ***Efavirenz (EFZ)***

9.1.10.2 Second Line regimen

- Switch to second line regimen in cases of failure to first line regimen:
  Adults
  - **Zidovudine (AZT)** + **Lamivudine (3TC)** + **Tenofovir (TDF)** +
  - **Lopinavir/ Ritonavir (LPV/RTV)**

  Children
  - **Didanosine (ddI)** + **Abacavir (ABC)** + **Lopinavir/Ritonavir (LPV/r)**

9.1.11 Dosage Guidelines for First Line ARV Therapy in Children in Malawi

Table 8: Doses for 1st line ARV Therapy in Children

Medicine	Dose
Stavudine (d4T)	2mg/kg/day
Lamivudine (3TC)	8mg/kg/day
Nevirapine (NVP)	8mg/kg/day

- i.e. target dose ratio = 1**:** 4**:** 4 (d4T**:**3TC**:**NVP)
- d4T/3TC/NVP dose ratio = 1**:** 3.75**:** 5

For d4T/3TC/NVP:

Weight (kg)	Dose a.m.	Dose p.m.
< 8	¼	-
8<12	¼	¼
12<18	½	¼
18<22	½	½
22<28	¾	½
28<32	¾	¾
32<38	1	¾
> 38	1	1

- The second line ARV treatment in children is a combination of **abacavir, didanosine** and **kaletra.**

9.1.12 Cotrimoxazole prophylaxis

Adults

- Give **Cotrimoxazole** 480mg twice daily to any HIV infected person in WHO clinical stage II, III or IV; any person with a CD4 count <500 cells/mm^3 regardsless of symptoms; HIV + pregnant women after the first trimester

Children

- Give **Cotrimoxazole 6-8mg/kg** once daily to all HIV exposed children from 4-6 weeks till HIV infection has definitely been ruled out, and to all HIV infected children.
- If allergic to Cotrimoxazole, give **Dapsone**.

9.2 Leprosy

9.2.1 Multibacillary

- The multi-drug treatment (MDT) regimen consists of
  - Monthly supervised doses of **Rifampicin** and **Clofazimine** taken on a fixed day at 4 week intervals
  - Daily unsupervised doses of **Clofazimine** and **Dapsone**
- Continue treatment until 24 monthly supervised doses of Rifampicin and Clofazimine have been completed within a maximum of 3 years

9.2.1.1 MDT regimen for multibacillary leprosy

Table 9: MDT regimen for multibacillary leprosy

Medicine	Frequency	Age years/dose (mg)		
		0-5 yrs	6-14 yrs	15 and over
Rifampicin	Monthly	300	300	600
Clofazimine	Monthly	100	200	300
Clofazimine	Daily	25*	50	50
Dapsone	Daily	25	50	100

*25 mg capsules of clofazimine are not available. Give a 50 mg capsule every second day instead

9.2.2 Paucibacillary

- The MDT regimen consists of :
  - A monthly supervised dose of **Rifampicin** taken on a fixed day at 4-week intervals
  - A daily unsupervised dose of **Dapsone**

- Continue treatment until 6 monthly supervised doses of Rifampicin have been completed within a maximum period 9 months

Table 10: MDT regimen for paubacillary leprosy

Medicine	Frequency	Age years/dose (mg) 0-5	6-14	15 and over
Rifampicin	Monthly	300	300	600
Dapsone	Daily	25	50	100

9.2.3 Leprosy reactions

- Do not stop therapy for leprosy during treatment of reactions
- Refer urgently to Leprosy Control Assistant

9.2.3.1. Severe reversal reaction; paucibacillary patients

- This is a delayed hypersensitivity allergic reaction manifesting itself as exacerbated leprosy skin lesions and/or enlarged tender nerves with or without nerve deficit

Treatment

- **Prednisolone** daily with the dose being gradually reduced every 2 weeks until a total of 12 weeks are completed (see table)

Table 11: Prednisolone regimen for paucibacillary severe reversal reactions

Week	**Prednisolone dose (mg daily)**
1-2	40
3-4	30
5-6	20
7-8	15
9-10	10
11-12	5

9.2.3.2 Severe reversal reaction; multibacillary patients

- This regimen is for multibacillary patients with a severe reversal reaction or recent nerve damage

Treatment

- daily **Prednisolone** being gradually reduced at intervals of 2 or 4 weeks over a period of 20 weeks (see table)

Table 12: Prednisolone regimen for multibacillary severe reversal reaction

Week	Prednisolone dose (mg daily)
1-2	40
3-6	30
7-10	20
11-14	15
15-18	10
19-20	5

9.2.3.3 Severe type 2 reaction

- This is an antigen-antibody complex reaction manifesting itself as fever, malaise and general body pain, and also frequently and typically with erythema nodosum leprosum (ENL)
- Rarely is iridocyclitis or orchiditis present

Treatment

- standard short-course of daily **Prednisolone** with the dose being gradually reduced by 5mg every 2 days until a total of 12 days is completed (see table below)
- Do not stop therapy for leprosy during treatment of reaction
- Refer urgently to Leprosy Control assistant

Table 13: Prednisolone regimen for severe type 2 reaction

Day	Prednisolone dose (mg daily)
1-2	30
3-4	25
5-6	20
7-8	15
9-10	10
11-12	5

9.2.3.4 Acute dapsone allergic reaction

- *Symptoms/Signs*: itching, rash, exfoliative dermatitis or Stevens-Johnson syndrome
- Refer urgently to Leprosy Control Assistant
- Stop **Dapsone**
- Then observe

Treatment

- Give Antihistamines, steroids or hospitalize
  - Depends on severity

9.3 Meningitis

- Refer patient to hospital as soon as diagnosis is suspected

A lumbar puncture is *essential* for diagnosis

- If possible, do a lumber puncture first and send the CSF in a sterile container along with the patient, but always start treatment before transfer with

Treatment

Adults

- **Benzyl penicillin** 5MU i/v or i/m stat
- Plus (if available) **Chloramphenicol** 1g i/v stat

Children

- **Benzyl penicillin** 100,000 units/kg i/v or i/m stat
- Plus **Chlorampenicol** 25 mg/kg i/v stat

Neonates

Benzyl penicillin and **Gentamycin** i/m or i/v

- When a lumber puncture cannot be done prior to referral, this should be done as soon as possible after admission

9.3.1 Bacterial meningitis

- In hospital, start an i/v infusion for antibiotics using **Dextrose 5%** (not more than 50 mL/kg per day for an infant) and continue until oral medication can be tolerated
- Give antibiotics for at least 14 days,

- if there is a good response in meningococcal disease stop at 7 days

Treatment

Adults (empirical treatment pending test results)

- **Ceftriaxone** 2g i/v every twelve hours

Alternatively

- **Chloromphenical** 1g every 6 hours, i/v and
- **Benzyl penicillin** 5MU every 6 hours, i/v
- Continue i/v antibiotics until 48 hours after the fever has subsided
- Change to oral **Amoxycillin** 500mg every 8 hours and **Chloramphenicol** 500mg every 6 hours to complete 14 days.

Children

- Give antibiotics for at least 7 days.
- **Ceftriaxone** 100mg/kg once daily i/m or i/v

Alternatively

- **Chloramphenicol** 25mg /kg i/v every 8 hours

plus

- **Benzylpenicillin** 100,000 IU/kg every 6 hours

9.3.2 Meningitis in neonates

- Usually caused by gram(-) organisms and requires treatment for 21 days (gram(+) infection)
- Otherwise give 14 days treatment
- Careful observation is essential
- While awaiting culture and sensitivity results or if they are not available give
  - **Benzyl penicillin** 100,000 units/kg every 6 hours, initially slow i/v or i/m
  - Plus **Gentamycin** 2.5 mg/kg i/m or i/v every 8 hours or **Gentamycin** 5mg/kg i/m once per day if 1 week old and **Gentamycin** 7.5 mg/kg once daily if over a week old.

Alternatively

- **Ampicillin** 50 mg/kg every 6 hours initially i/v later i/m as an alternative to **Benzyl penicillin**

If still febrile after 48 hours;

- Add **Cefotaxime**.

9.3.3 Cryptococcal meningitis

- *Symptoms/Signs:* severe headaches, not responding to non-narcotics anaelegiscs, the patient nearly always has HIV infection with advanced immune suppression.
- Confirm diagnosis with Indian ink stain, Cryptococcal antigen and/or culture of the CSF.
- Refer for specialist management with **Amphotericin B** 0.7-1.0 mg/kg daily infused in **glucose 5%** i/v solution over 4-6 hours for 2 weeks if tolerated, followed by **Fluconazole** 400 mg once daily for 6 weeks and then 200 mg once daily lifelong.

Alternatively if available

- **Fluconazole** 800mg orally or i/v once daily for 2 weeks, followed by Fluconazole 400 mg once daily for 6 weeks and then 200 mg once daily lifelong.

9.3.4 Meningococcal meningitis (prophylaxis)

- Recommended for selected groups living in very crowded conditions and for close household contacts

Adults

- **Ciprofloxacin** 500 mg stat.

Alternatively

- **Doxycycline** 300mg stat

Children

- **Doxycycline** 6 mg/kg

9.4 Tetanus

- Immunization has significantly reduced the incidence of this

9.4.1 Adult tetanus

- Good nursing care of the heavily sedated patient is essential
- Give active immunization against tetanus after recovery

General measures

- Nurse the patient in a quiet area
- Maintain adequate hydration and nutrition
- Prevent aspiration of fluid into the lungs
- Clean and debride necrotic wounds thoroughly

- Change from parenteral to oral medication as soon as possible
- Avoid provoking spasms
- Encourage active exercise after spasms have ceased

Treatment

- **Diazepam** 20 mg i/m or i/v **Chlorpromazine** 50 mg i/m or i/v given alternately every 3 hours

Alternatively

- **Diazepam** infusion 40 mg in one liter of i/v dextrose or normal saline every 6-8 hours

Take care: respiratory depression may occur

  - Dose sizes or frequencies of the above medicines can be increased if necessary to control spasms
- **Anti-tetanus serum** 20,000 units i/v stat
  - Give this after a test dose of 1,500 units s/c
- **Benzyl penicillin** 2 MU i/v every 6 hours for 7 days
- **Metronidazole** 500 mg i/v or 400 mg oral every 8 hours for 7 days
- **Tetanus toxoid vaccination**: give the full course

9.4.2 Neonatal Tetanus

Symptoms: poor feeding, constipation, stiffness and spasms

- Prevent if possible and aggressively treat respiratory complications as these are the main cause of death
- Start active immunization against tetanus once the child has recovered

General measures

- Nurse the baby in an intensive care area with close observation and attention to airway, temperature and spasms
- Maintain adequate hydration, initially with i/v fluids
- Maintain nutrition with expressed breast milk via an NGT
- Have a mucous extractor or other suction available
- Avoid i/m injections as much as possible by use of alternative routes (e.g. NGT, rectal administration) where indicated
- Change from i/m injections to oral medication as soon as possible and keep handling to a minimum in order to avoid provoking spasms
- Thoroughly clean the umbilical area

Treatment

- **Paraldehyde** 0.2 ml/kg i/m or 0.4 ml/kg rectally (see note 1 below) followed by
- **Phenobarbitone** 15 mg/kg loading dose stat initially then10 mg i/v plus 5 mg i/m
- Continue with **Diazepam** 0.5 mg/kg by NGT or rectally (see *note 2 below*) or slow i/v and **Phenobarbitione** 5-10 mg/kg by NGT or i/m
- Give these drugs alternatively every 3 hours
- **Anti-tetanus serum** 10,000 units i/m or i/v every 6 hours for 5 days

Once spasms are controlled;

- **Phenobarbitone** 5-10 mg/kg once daily orally as maintenance dose

Note:

1) **Paraldehyde**; dissolves plastic so use a glass syringe. However if this is not available, use a plastic syringe but make sure the drug is given promptly and not left in the syringe before administration. The drug may also be given rectally using a syringe after removing the needle.
2) **Diazepam** rectal administration (by syringe after removing the needle) is as reliable as i/v and easier and safer to give.

9.4.3 Tetanus Prevention

- Promote **tetanus toxoid** vaccination (TTV) in pregnant women and all women of child bearing age (*see Section 12.3 page 100)*
- Ensure adequate surgical toilet plus passive (ATS 1,500 units i/m or s/c) and active (TTV) immunization after wounds, bites and burns

9.4.4 Tetanus toxoid vaccination (TTV)

9.4.4.1 Unimmunised or never fully immunized patients

- Give a full course of vaccination
- One dose (0.5 mL) s/c or i/m in weeks 1,4 and 8
- For women of childbearing age (*see Section 12.3 page 100)*

9.4.4.2 Fully immunized but last booster >10 years ago:

- Give one booster dose of 0.5 mL s/c or i/m

Fully immunized patients who have had a booster within the last 10 years do not need treatment with tetanus antitoxin (ATS) or tetanus toxoid vaccination (TTV)

9.5 Tuberculosis (TB)

- For detailed information on the control and management of TB refer to the ***National Tuberculosis Control Programme Manual (MOH, 2007)***
- Suspect pulmonary TB if coughing for 3 weeks or more, usually with one or more of the following:
    - Fever
    - Chest pain
    - Shortness of breath
    - Loss of weight
    - Hemoptysis
- *Symptoms/Signs*: enlarged lymph nodes (lymphadenopathy), swelling of abdomen due to fluid (ascites), tender swelling of the back (TB spine), sometimes weakness of the legs (TB spine), stiffness of the neck (meningitis), confusion (meningitis)
- If TB is suspected, refer the patient to hospital
- Diagnosis and classification of pulmonary TB must be based on *sputum examination* (smear microscopy for acid-fast bacilli)

Do not start TB treatment until a firm diagnosis has been made

- Effective treatment of TB and prevention of the development of medicine resistance depends on an appropriate combination of at least 2 medicines taken:
    - Regularly
    - In the correct dose
    - For the full recommended duration
    - Under direct observation (DOT)

Stress to the patient the importance of regular medicine taking as the basis for the cure of TB

- HIV positive patients can be successfully treated for TB

9.5.1 Anti-Tuberculosis Medicines

- Malawi is now treating TB patients using fixed dose combinations (FDCs), single tablets and streptomycin injection as shown below:

a) Combination Tablets

Adult Formulations

- **RHZE** contains:Rifampicin 150mg, Isoniazid 75mg, Pyrazinamide 400mg, Ethambutol 275mg
- **RHE** contains:Rifampicin 150mg, Isoniazid 75mg, Ethambutol 275mg
- **RH** contains: Rifampicin 150mg, Isoniazid 75mg

Paediatric Formulations

- **RHZ** contains: Rifampicin 60mg, Isoniazid 30mg, Pyrazinamide 150mg
- **RH** contains: Rifampicin 60mg, Isoniazid 30mg

b) Single tablets

- **Z (pyrazinamide)** contains: Pyrazinamide 400mg
- **E (ethambutol)** contains: Ethambutol 400mg, Ethambutol 100mg
- **H100 (isoniazid)** contains: Isoniazid 100mg

c) Injections

- **S (streptomycin)** contains: Streptomycin 1g

9.5.2. TB Treatment Regimens

9.5.2.1 Treatment Regimen 1 (for new patients)

- ***Initial intensive phase****:*
  - Newly diagnosed TB patients are admitted for 2 weeks in hospital where they receive daily treatment under DOT.
  - The remaining 6 weeks of the intensive phase is taken daily either in hospital or in the community according to the patient's DOT option.
  - In central hospitals, patients are started on ambulatory treatment depending on the condition of the patient from the first day, but treatment is on daily basis just like the district hospitals.
- ***Continuation phase:***
  - Patients take medicines under supervision.
  - Medicines are collected from the nearest health facilities every fortnight.

Table 14: Dosages of FDC formulations

ADULTS			
Body weight in kg	**Initial phase 2 months**		**Continuation phase 4 months**
	[RHZE] [R150/H75/Z400/E275] Number of tablets*		[RH] [R150/H75] Number of tablets*
30-37	2		2
38-54	3		3
55-74	4		4
75 and over	5		5
CHILDREN			
Body weight in kg	**Initial phase 2 months**		**Continuation phase 4 months**
	[RHZ] (R60/H30/Z150) Number of tablets or sachets*	E100 Number of tablets or sachets*	[RH] (R60/H30) Number of tablets or sachets*
< 7	1	1	1
8-9	1.5	1.5	1.5
10-14	2	2	2
15-19	3	3	3
20-24	4	4	4
25-29	5	5	5
Re-adjust dose as body weight increases			

9.5.2.2 Treatment Regimen 2

Indications for use: relapse, return after default, treatment failure and recurrent Tuberculosis.

- The regimen is **2SRHZE/1RHZE/5RHE**

- Regimen consists of 2 months of **SRHZE** daily, 1 month of **RHZE** daily followed by 5 months of **RHE** daily, all under supervision.

Note:

(1) Sputum positive cases that have previously taken anti-tuberculosis medicines for 1 month or more must be suspected of discharging tubercle bacilli resistant to one or more anti-TB medicines.

(2) These patients must submit sputum specimens for medicine sensitivity testing before starting the re-treatment regimen.

Table 15: Treatment regimen 2

ADULTS							
Body weight in kg	**Initial phase 2 months** [SRHZE]			**Continuation phase 5 months** [RHZE] [R150/H75/Z400/E275]			
	Streptomycin daily injection for 2 months	[RHZE] Number of tablets daily for 2 months		[Z] Number of tablets daily for 5 months		[RHE] [R150/H75/E275] Number of tablets daily for 5 months	
30-37	0.5g	2		2		2	
38-54	0.75g	3		3		3	
55-74	1g	4		4		4	
75 and over	1g	5		5		5	
CHILDREN							
Body weight in kg	**Initial phase daily doses for months** [SRHZ] and E			**Initial phase daily dose for 1 month** [RHZ] and E		**Continuation phase daily dose for 5 months** [RH] and E [R60/H30/] and E100	
	Streptomycin daily injection	[RHZ] Number of	[E] Number of	[RHZ] Number of	[E] Number of	[RH] Number of	[E] Number of

		tablets per day	tablets per day	tablets per day	tablets per day	tablets per day	tablets per day
< 7	15mg/kg	1	1	1	1	1	1
8-9	15mg/kg	1.5	1.5	1.5	1.5	1.5	1.5
10-15	15mg/kg	2	2	2	2	2	2
15-19	15mg/kg	3	3	3	3	3	3
20-24	15mg/kg	4	4	4	4	4	4
25-29	0.5mg	5	5	5	5	5	5

9.5.3. Tuberculosis Meningitis

- The regimen for adult and childhood cases of tuberculosis meningitis is different from above.
- The regimen is 2SRHZ/7RH and doses are as below

Table 16: Dose regimen for tuberculosis meningitis

Weight in kgs	**Daily during weeks 1-8**			**Daily during weeks 9 – 32**
	S	**RH**	**Z**	**RH**
Over 55	1 g	4	4	4
40 – 55	0.75g	3	3	3
25 – 39	0.5	2	2	2
20 – 24	15mg/kg	1.5	1.5	1.5
15 – 19	15mg/kg	1.5	1.5	1.5
9 – 14	15mg/kg	1	1	1
5 – 8	15mg/kg	0.5	0.5	0.5
0 – 4	15mg/kg	0.25	0.25	0.25

- The regimen consists of 2 months of **Streptomycin**, **Rifinah** and **Pyrazinamide** given under supervision on a daily basis followed by 7 months of daily **Rifinah**.

9.5.4 Medicine Resistant Tuberculosis (MRT)

- Two types of medicine resistant TB:
  - Primary resistance (resistance in newly diagnosed TB cases) and
  - Secondary resistance (resistance in previously treated TB cases).

a) Multi-Drug Resistant TB (MDR-TB) - resistant to both rifampicin and isoniazid.
b) Extensively-Drug Resistant TB (XDR-TB) - also resistant to any fluoroquinolone, and at least one of the three injectable second line anti-TB medicines (**capreomycin**, **kanamycin** and **amicacin)**

9.5.4.1 Treatment of Medicine-resistant TB

- MDR-TB treatment requires use of second line anti-TB medicines which have to be taken for 24 months.
- The patients are managed in their communities.

Table 17: MDR-TB Treatment Regime

INTENSIVE PHASE: 6 MONTHS		
Patient weight	**Medicine**	**Dosage**
< 50 KGS	Kanamycin (Km)	750 mg
	Ethionamide (Et)	500 mg
	Pyrazinamide (Z)	1000 mg
	Ofloxacin (Of)	600 mg
	Cycloserine (Cs)	500 mg
50 - 65 kgs	Kanamycin	1000 mg
	Ethionamide	750 mg
	Pyrazinamide	1500 mg
	Ofloxacin	600 mg
	Cycloserine	750 mg
>65 kgs	Kanamycin	1000 mg
	Ethionamide	750 mg
	Pyrazinamide	2000 mg
	Ofloxacin	800 mg
	Cycloserine	750 mg

CONTINUATION PHASE: 18 MONTHS		
Patient weight	**Medicine**	**Dosage**
< 50 kg	Ethionamide	500 mg
	Ofloxacin	600 mg
	Cycloserine	500 mg
50 – 65 kg	Ethionamide	750 mg
	Ofloxacin	600 mg
	Cycloserine	750 mg
>65 kg	Ethionamide	750 mg
	Ofloxacin	800 mg

See **Guidelines for the Programmatic Management of Multi-medicine Resistant Tuberculosis in Malawi (MOH, 2008)** for details.

9.5.5 Management of Anti – TB Drug Reactions

- The table below gives an outline of symptoms of the common drug reactions and how to manage them.

Table 18: Minor side effects not requiring treatment to be stopped:

Symptoms	Medicine	Management
Abdominal pain, nausea	Related to rifampicin	Give oral medicines to the patient last thing at night
Burning of the feet	Related to isoniazid peripheral neuropathy	Continue isoniazid; give pyridoxine 50 mg - 75 mg daily large doses of pyridoxine may interfere with the action of isoniazid (wherever possible, pyridoxine 10 mg daily should be given routinely with isoniazid)
Joint pains	Related to Pyrazinamide	Continue Pyrazinamide; use Aspirin or non-steroidal anti-inflammatory medicine
Red urine	Related to Rifampicin	Reassure the patient
Women on Rifampicin	Rifampicin may reduce the effectiveness of the Oral contraceptive pill	Alternative contraception should be provided

Table 19: Major Side effects requiring treatment to be stopped:

Symptoms	Medicine	Management
Deafness	Related to Streptomycin	Otoscopy to rule out other causes **Stop** Streptomycin if no other explanation. Use ethambutol instead
Dizziness	If true vertigo and nystagmus, related to Streptomycin	**Stop** Streptomycin; If just dizziness with no nystagmus, try dose reduction for one week, but if no better stop Streptomycin. Use Ethambutol instead
Generalised reactions including shock, purpura	May be due to rifampicin, Pyrazinamide and/ or Streptomycin	**Stop** all medication Use different combination of medicines
Jaundice	Related to drug-induced hepatitis.	**Stop** all antituberculosis medicines until jaundice and liver function tests revert to normal (see below)
Skin itching	Related to all anti-tuberculosis medicines	**Stop** antituberculosis medicines
Visual impairment	Related to Ethambutol	Visual examination –seek clarification **Stop** Ethambutol
Vomiting ++/ confusion	Suspect drug-induced hepatitis	Urgent liver function tests (lfts) If lfts not available, **stop** anti-tuberculosis medicines and observe.

9.5.6 Complications of Tuberculosis and their Management

9.5.6.1 Pulmonary Tuberculosis

- **Haemoptysis (coughing blood):**
  - If severe, refer to hospital for bed rest, sedatives and probably transfusion.

  - Do a chest x-ray to rule out potentially treatable conditions such as aspergilloma or bronchiectasis.
- **Pleural effusion (collection of fluid between the lungs and the chest wall):**
  - Drain big pleural effusions to relieve symptoms of dyspnoea.
    - Empyema (collection of pus alone) should be drained.
- **Spontaneous pneumothorax (collection of air between the lungs and the chest wall):**
    - This may cause sudden onset of shortness of breath.
    - May require admission to hospital for drainage with an underwater seal.
- **Fibrosis (scarring) of the lungs:**
    - This may lead to cor-pulmonale (right-sided heart failure) in the long term.
    - Symptomatic treatment may be required.
- **Bronchiectasis:**
    - Coughing due to residual lung damage sometimes with expectoration of large volumes of sputum and sometimes blood.
    - Symptomatic treatment may be required provided that the sputum is negative for AAFB.

9.5.6.2 Extra-Pulmonary Tuberculosis

- Complications will depend upon the site of the disease:
  - **Tuberculosis of the spine***:* paraplegia (weakness of the lower limbs). Refer to hospital immediately.
  - **TB meningitis***:* cranial nerve damage. Give steroids.
  - **TB lymphadenitis***:* cold abscesses and suppurating fistulae. Do I and D.
  - **Pericardial effusion***:* heart failure. Give high doses of steroids.
  - **Cardiac tamponade (distress associated with shock):** Refer to tertiary level.
  - **Pleural effusio***n:* respiratory failure. Do therapeutic pleural tap.
  - **Tuberculoma:** focal seizures or neurological signs. Order CT scan for diagnosis
  - **TB Abdomen**: ascites. Do ascitic tap for diagnosis. Finding of lymph nodes on ultrasound scan of the abdomen can also be diagnostic.

9.5.7 Use of Anti-Tuberculosis Medicines in Special Situations

9.5.7.1 Pregnancy and Reproductive Health

- **Streptomycin** is potentially ototoxic and may cause deafness in babies.
- **Streptomycin** should **not** be given in pregnancy.
- **Rifampicin** stimulates formation of liver enzymes and therefore can reduce the effectiveness of the oral contraceptive pill.
- Advise patients on TB treatment to take alternative contraception while on **rifinah**.

9.5.7.2 Renal impairment and renal failure

- Give normal dosage of Rifampicin, Isoniazi and Pyrazinamide to patients with renal failure.

Note:

Streptomycin and Ethambutol are given in reduced doses and less frequently in patients with renal failure.

9.5.7.3 Liver impairment and liver failure

- Isoniazid, rifampicin and pyrazinamide are hepatotoxic.
- Patients with active liver disease who develop TB should not receive pyrazinamide or rifampicin.
  - Give streptomycin, isoniazid and ethambutol for intensive phase of treatment, and isoniazid and ethambutol for maintenance treatment.
  - If jaundice is acute and severe, treat initially with just streptomycin and ethambutol.

9.5.7.4 Epilepsy

- Rifampicin reduces plasma levels of Phenobarbitone.
- Advise patients to increase the dose of phenobarbitone.

9.5.7.5 TB/ART

- Rifampicin reduces plasma levels of Nevirapine by 30%.
- Low Nevirapine levels may increase the risk of the HIV becoming resistant to the medicine and thus compromise the effectiveness of the ART.

9.5.8 Corticosteroids and Tuberculosis

- Adjunctive therapy with corticosteroids, in conjunction with anti-TB medicines, may be appropriate in tuberculosis meningitis, pericardial and pleural disease.
- **Prednisolone 40mg** daily for 30 days in TB meningitis, patients with altered consciousness, neurological defects or spinal block, followed by a gradual reduction in dose in the succeeding weeks.
- **Prednisolone 60mg** for 4 weeks for pericardial effusion and constrictive pericarditis, followed by 30 mg for the next 2 weeks and tapering to zero over the next 2 weeks.
- **Prednisolone 40mg** daily for 1 - 2 weeks for large pleural effusion.

9.5.9 Management of Household Contacts of Smear-Positive TB Cases

9.5.9.1 Children aged 6 years and over

- Investigate for TB if symptoms are present
- Treat if TB is present.

Note:

National TB Program is advocating for active case finding for all household members.

9.5.9.2 Children below 6 years:

- Screen all children using either clinical assessment, or tuberculin test or chest x-ray including those who are household contacts of smear-positive TB cases.
- Commence child on **Isoniazid** preventive therapy (5mg / kg daily for 6 months) if there is no evidence of active TB.
    - If a child contact of any age has symptoms suggestive of TB, refer for further assessment.
- Register and treat the child for TB according to the National TB Program guidelines if diagnosed with TB.

9.5.9.3 Babies born to mothers with smear-positive Pulmonary TB

- **Isoniazid** (5 mg / kg daily for 6 months).
    - Vaccinate with BCG at the end of 6 months.

- Continue breast-feeding.
- Should child develop symptoms while on isoniazid preventive therapy, investigate for active TB.
- If TB is diagnosed, stop isoniazid and institute anti-TB treatment according to the guidelines.

9.6 Typhoid

- Prevent through clean water, improved sanitation and health education
- Diagnosis should be done by blood culture, Widal tests are inaccurate!

Treatment

- **Ciprofloxacin** 500mg oral or 400 mg i/v every 12 hours for 14 days treatment the same for children

Alternatively

- **Ceftriaxone** 2g i/v every 24 hours for 14 days
- Switch to oral Ciprofloxacin when improving and patient able to tolerate

If severe

- i/v treatment is preferred
- Continue for a total of 14 days, switch to oral ciprofloxacin when improving and patient is able to tolerate oral medicines

Supportive measures:

- i/v *fluids* may be needed
  Ensure meticulous hand washing and proper stool disposal
- Disinfect with chlorine
- Maintain good nutrition
- Give analgesic treatment for pain relief *(see Section 24 page 196)*
- Intestinal perforation and intestinal bleeding are complications
- Refer urgently for surgical attention if suspected

9.7 Sepsis

- Sepsis is a condition in which infection (mostly with bacteria) causes a systemic inflammatory response resulting in severe illness

- Try to find the cause and treat accordingly; where possible blood culture should be done before starting treatment
- Sepsis is common in HIV infected patients and is mainly caused by Pneumococcus and non-typhoidal Salmonella
- Always refer to hospital for systemic treatment, but in severely ill patients before referral give:

Adults

- **Chloramphenicol** 1g i/v or i/m stat *plus*
- **Gentamycin** 240 mg slow i/v or i/m stat *plus*
- **Quinine** 1200mg i/v in 5% dextrose over 4 hours

Children

- **Benzyl penicillin** 50,000 units/kg i/v or i/m stat *plus*
- **Gentamycin** 7.5 mg/kg slow i/v or i/m stat *plus*
- **Quinine** 10 mg/kg i/m stat

- The following hospital treatment regimens are empirical and should be amended accordingly based on the results of culture and sensitivity testing

***Hospital treatment*:**

Adults:

- **Ceftriaxone** 2g i/v 24 hourly for 10 days
- Switch to oral **Co-amoxiclavulin** 625 mg every 8 hours or oral **Ciprofloxacin** 500 mg every 12 hours plus **Amoxycillin** 500 mg every 8 hours when improved

Alternatively

- **Ciprofloxacilin** 400 mg i/v every 12 hours or 500 mg orally every 12 hours *plus*
- **Benzylpenicillin** 2MU i/v every 6 hours
- Switch to oral **Ciprofloxacin** 500 mg every 12 hours plus **Amoxycillin** 500 mg every 8 hours, or oral **Co-amoxiclavulin** 625 mg every 8 hours, when improved
- Antibiotics should be given for a minimum of 10 days

If intra-abdominal source suspected:

- Add **Metronidazole** 500 mg i/v or 400 mg orally every 8 hours

If still febrile after 72 hours reassess the patient

Children

- **Chloramphenicol** 25 mg/kg every 8 hours, initially i/v later orally *plus*
- **Benzyl penicillin** 50,000 units/kg every 8 hours, initially slow i/v later i/m

Alternative to benzyl penicillin

- **Ampicillin** 40 mg/kg i/v every 6 hours until oral medication can be tolerated *then*
- **Amoxycillin** 250 mg every 8 hours

*If still febrile after 72 hours***:**

- Add **Gentamicin** 7.5 mg/kg once daily

Neonates

- **Benzyl penicillin** or **Ampicillin/Amoxicillin** as for (older) children above *plus*
- **Gentamycin** 2.5 mg/kg every 8 hours.

If severe:

- **Chloramphenicol** 25mg/kg i/v bolus every 6 hours until 48 hours after fever has settled then 500 mg orally every 6 hours
- Continue for a total of 14 days
- Or **Ceftriaxone** 50mg/kg i/v once daily until 48hours after fever has settled then continue with **Ciprofloxacin**

9.8. Chicken pox (varicella)

- *Cause*s: varicella zoster virus
- More severe and extensive in HIV (+) patients

General Management

- Application of wet compresses or use of cool baths may help to control itching, (scratching may lead disfigurement)
- In severe itching, give a sedative systemic antihistamine (e.g. oral **Promethazine** or **Chlorpherniramine**).
- Keep hands clean and nails clipped short to reduce problems caused by scratching

Treatment

Adults (symptomatic treatment):

- Apply **Calamine + Sulphur 2% lotion** nocte or 2 times daily
- Give **Paracetamol 500mg** every 4 hours

- Has more complications in adults, in particular those that are immuno-compromised. Varicella pneumonitis is particularly serious. Therefore antiviral treatment is advised.
  Acyclovir 800 mg 5 times a day for 7-10 days.

Children (symptomatic treatment):

- Apply **calamine + sulphur** 2% lotion 2 times daily
- **Paracetamol** 10 mg/kg every 6 hours as required (Avoid Aspirin in children).
- For severe and extensive conditions give **Acyclovir** 400mg every 8 hours for 7days
  In case of secondary infection give antibiotics as per *Section 18.1 page 157*, consider HIV test

10.0 Miscellaneous Conditions

10.1 Fever

- An axillary temperature of 38˚C or over indicates significant fever and the need for antipyretic treatment. This is not the case for adults: temperatures in patients of up to 40.5 ^{o}Celsius can be accepted, but anti-pyretic treatment can be given for symptomatic relief
- Investigate (by clinical assessment, assisted where available by laboratory tests) and treat the underlying cause.
- In neonates, failure to feed may precede development of fever in cases of septicaemia.
- A positive malaria blood slide in a patient with fever does not always mean that the fever is caused by malaria. Treat for malaria but keep an open mind for other causes such as sepsis. This is more likely in HIV infected patients with advanced immune suppression.

Treatment

- Tepid sponging may be used as a supportive measure to reduce fever

Adults

Paracetamol 500 mg every 4 hours or 1000 mg every 6 to 8 hours, maximum of 4 doses in 24 hours, preferably after food

Alternatively:

Aspirin 600mg every 6 hours

Children

Paracetamol 10 mg/kg/dose

Table 20: Paracetamol dose table for children

Age group (year)	Dose per 6 hours (mg)	Tablets (500 mg)	Syrup (120 mg/5 mL)
<1	125	¼	5 mL
1-5	250	½	10 mL
6-12	500	1	
>12	1000 (1 g)	2	

Note:

a) Antipyretic should not be given for more than 3 days
b) Prolonged fever may indicate another condition and/or failure of treatment
c) Aspirin should not be given to children less than 12 years old

11.0 Musculoskeletal disorders

11.1 Arthritis (non-infective)

- Make specific diagnosis whenever possible and treat accordingly
- An acute mono-arthritis should always be considered to be infective until evidence to the contrary is obtained

11.1.1 Non-specific inflammatory arthritis, and rheumatoid arthritis

Treatment

Adults

- **Ibuprofen** 1.2–1.8g daily in 3 divided doses after food

Alternatively:

- **Aspirin** 300-900 mg after food every 4 hours. Maximum of 4g daily in divided doses
  in acute conditions
- Review after 7 days
- *If not responding:* change to an alternative non-steroidal anti-inflammatory drug (NSAID):
  - **Indomethacin** 25 – 50mg every 8 hours after food for another 7 days *or*
  - **Diclofenac sodium** 25-50mg every 8 hours after food or SR 75mg every 12 hours for another 7 days
  - Consider referral for specialist opinion

Children:

- Always refer to hospital
- Prior to referral, give **Aspirin** 20 mg/kg after food every 6 hours

11.2 Arthritis (septic)

- Always refer to hospital for systemic treatment
- Aspirate the joint for diagnostic and therapeutic purposes
- Surgical drainage may be indicated
- TB septic arthritis is treated as for other forms of extra-pulmonary TB

Treatment

Adults

- **Flucloxacillin** 1g i/v every 6 hours for at least 14 days *plus*,
- **Ciprofloxacin** 500mg orally every twelve hours
- A further 2-4 weeks of oral antibiotics may be required

Alternatively if penicillin allergic use **Ceftriaxone** 2g i/v daily for 2 weeks

- followed by oral **Erythromycin** 500mg every 6 hours and
- **Ciprofloxacin** 500mg every 12 hours for a of duration 2-4 weeks

Children:

- **Chloramphenicol** 12.5 mg/kg every 8 hours for at least 14 days, or 4 weeks if there is associated osteomyelitis
- Clinically evident by bone swelling or proven by X-rays after the initial 14 day course

Alternativlye when staphylococcal infection is suspected:

- **Flucloxacillin** 25 mg/kg i/v every 6 hours for 14 days

11.3 Gout

11.3.1 Acute attack

- Rest
- Ensure abundant fluid intake

Treatment

- **Ibuprofen** 800mg every 6 hours preferably after food in established cases until attack subsides

Alternatively:

- **Indomethacin** 50-75 every 8 hours with food or
- **Diclofenac sodium 25-50mg** every 8 hours preferably after food
- **Colchicine** 1.0mg followed by 0.5mg no more frequently than every 4 hours until pain is relieved or diarrhoea or vomiting starts. Maximum of 6mg per course; course should not to be repeated within 3 days
- **Prednisolone 30 – 50mg/**day for 5 -7 days

11.3.2 Prevention of attacks

- Encourage physical exercise
- Encourage reduction in dietary protein (if intake is high)
- Avoid alcohol

Treatment

- **Allopurinol** 100 mg daily after food
- Only indicated in recurrent gout attacks.
- Do not start this treatment until an acute attack has completely subsided.

- Gradually increase over 1-3 weeks to 300 mg once daily, according to plasma or urinary uric acid concentration
- *Maintenance dose*: Up to 200 -600mg daily; dosage >300 mg to be given in divided doses; may be required life long.

11.4 Musculoskeletal pain and trauma

- Joint pain, lumbago, and chronic musculoskeletal disorders are common in adults

Adults (symptomatic treatment)

- Give analgesics

- *If pain persistent or severe*:
  - Refer to a surgeon or a physiotherapist

11.5 Osteomyelitis

11.5.1 Acute Osteomyelitis

Adults and Children:

- Admit to hospital for rest
- Splint the affected limb as required,
- Give analgesics

- *If pain is severe:*
- Give **Pethidine** 1mg/kg i/m
- Repeat every 6 hours for a maximum 4 doses
- Drain pus surgically from the bone and send for culture and sensitivity testing
- Do not await culture results before starting antibiotic treatment

Children Over 2 years:

- **Flucloxacillin** 25 mg/kg up to a maximum of 500 mg every 6 hours, initially i/v, then orally from 48 hours after fever has settled

Alternatively:

- **Chloramphenicol** 25 mg/kg up to a maximum of 500mg every 8 hours, initially i/v, then orally from 48 hours after fever has settled

Children Under 2 years:

- **Chloramphenicol** 25 mg/kg every 8 hours, initially i/v, then orally from 48 hours after fever has settled

Alternatively, if staphylococcal infection is very likely:

- **Flucloxacillin** 25 mg/kg every 6 hours, initially i/v, then orally from 48 hours after fever has settled
- Antibiotic treatment should be continued for 4 weeks under hospital supervision.

11.5.2 Chronic osteomyelitis

Adults and Children:

Treatment

- Surgical treatment by sequestrectomy when an adequate involucrum has formed
- Antibiotic treatment for febrile flare-ups of infection as for acute osteomyelitis (See *Section 11.5.1 above)*
- Antibiotic cover for surgery as appropriate after culture and sensitivity testing
- Give **Ibuprofen** 1.2 – 1.8g daily in 3 divided doses after food

Alternatively:

- **Aspirin** 10mg/kg orally, preferably after food, every 6 hours up to an adult maximum of 600 mg per dose

11.6 Rheumatic fever

- Always refer to hospital

11.6.1 Acute attack

- **Benzathine penicillin** 1.2MU i/m single dose
  - Children <30 kg: **Benzathine penicillin** 600,000 units

Alternatively, if compliance can be ensured:

- **Phenoxymethylpenicillin** 250 mg every 6 hours for 10 days
  - Children: **Phenoxymethylpenicillin** 12.5 mg/kg/dose

Alternatively, if penicillin allergy:

- **Erythromycin** 500mg every 8 hours for 10 days

11.6.2 Acute Carditis

- Strict bed rest until carditis has resolved
- *Adults and children*:

  Treatment
  - **Aspirin** 25mg/kg, preferably after food, every 6 hours
  - Reduce dose if tinnitus or other toxic symptoms develop

  - Continue treatment with this until fever and joint inflammation are controlled
  - Then reduce dose gradually over a 2 week period
- *If symptoms recur*:
  - Restart full dose
- *In severe carditis with heart failure and not responding to aspirin*:
  - Add **prednisolone** 2 mg/kg once daily
    - Reduce dose gradually after 3-4 weeks
  - Treat heart failure

11.6.3 Chorea

Treatment

Adults and Children:

- **Haloperidol** 25 micrograms/kg every 8 hours

11.6.4 Prophylaxis of Rheumatic fever

11.6.4.1 Prevention of further attacks

- Continue treatment until at least age 25

Treatment

- **Benzathine penicillin** 1.2 MU i/m monthly
  - Children < 30 kg: 600,000 units/dose

Alternative if compliance can be ensured:

- **Phenoxymethylpenicillin** 250mg every 12 hours

Alternative if penicillin allergy:

- **Erythromycin** 500 mg daily
- Children <30 kg: **250mg**

11.6.4.2 Prophylaxis of bacterial endocarditis

- Needed to prevent bacterial endocarditis in those with previous rheumatic fever or any heart valve abnormalities of other cause.

11.6.4.3 Before dental extraction

Prophylaxis in Adults and Children > 30 kg:

- **Amoxycillin** 3g oral taken 1 hour before the dental procedure

Alternatively if penicillin allergy:

- **Erythromycin** 1.5g taken 1 hour before the procedure and 500 mg 6 hours later

Prophylaxis in Children > 30 kg:

- **Amoxycillin** 50 mg/kg taken 1 hour before dental procedure, and repeated 6 hours later

Alternatively if penicillin allergy:

- **Erythromycin** 75mg/kg taken 1 hour before procedure and 25 mg/kg 6 hours later

11.6.4.4 Prophylaxis before other procedures

a) ***For genito-urinary surgery or instrumentation***:

- **Amoxycillin** 1g i/v or i/m plus
- **Gentamycin** 2mg/kg i/v or i/m 30 minutes before the procedure, then
- **Amoxycillin** 500mg taken 6 hours later
    - *Alternative if penicillin allergy:*
- **Erythromycin** 500mg every 6 hours for 48 hours, instead of amoxicillin

b) ***For obstetric and gynecological procedures***:

- Not required except for those with prosthetic heart valves who should receive prophylaxis as for dental procedures

11.7 Tropical pyomyositis

- Treatment is both medical and surgical
- Medical treatment may prevent abscess formation at the start of infection, when the muscle is swollen, hot and painful
- Immobilize and give:

Treatment

Adult and children:

- **Flucloxacillin** 1g i/v every 6 hours for at least 14 days *plus*,
- **Ciprofloxacin** 500mg orally twice daily

If penicillin allergic

- **Ceftriaxone** 2g i/v daily for 2 weeks
- Give surgical treatment (abscess drainage) when the swelling becomes fluctuant.

12.0 Obstetric and Gynaecological Conditions

12.1 Abnormal Vaginal Bleeding

- Bleeding which deviates from the normal menstrual pattern in terms of the amount, duration or interval

a) In young adolescents

- It is mainly physiological and pathology is very rare. Manage conservatively
  - Heavy, irregular menses will cause anaemia which may be serious
  - Exclude complications of pregnancy

Treatment

- Treat anaemia *see Section 1.2. page 1*
- Give **low-oestrogen combined contraceptive** tablets for a minimum of 6 months

If bleeding is very heavy:

- Give 2 tablets daily for 10 days then 1 tablet daily for 2-6 months

Note:

- Low-oestrogen combined contraceptive is contraindicated if there is migraine or raised BP

  Refer to Hospital.

If heavy menses return:

- Refer to hospital

b) In women of child-bearing age:

- *Causes:* complication of pregnancy, including ectopic pregnancy, use of hormononal method of contraception or an intra-uterine device (IUD), fibroids, choriocarcinoma, cervical cancer.
- Consider visual inspection of cervix after applying 3-5% **acetic acid** (VIA).
- Refer to hospital

Investigate always persistent bleeding after delivery or abortion

- If all pathology has been excluded then the bleeding is dysfunctional.

Treatment

- Cyclical **Progesterone** 5-10 mg daily for 14 days in the 2nd phase of the menstrual cycle for 3 months

Alternatively

- **Low oestrogen combined contraceptive** 1 tablet for 14 days in the 2nd phase of the menstrual cycle for 3 months
- If no improvement, refer for specialist care.

c) In post-menopausal women:

- Always investigate vaginal bleeding
- Important causes are endometrial cancer and cervical carcinoma
- Always refer for hospital treatment

At hospital

- Perform a thorough vaginal examination including speculum exam, endometrial thickness scan if greater than 4 mm then consider dilatation and curettage and send sample for histology assessment

12.2 Ante-and Post-natal care

Refer to Reproductive Health Guidelines

- Check on tetanus immunization status *see Section 12.3 below*

During pregnancy and for 6 weeks after delivery:

- **Folic acid** 5 mg once daily
- **Ferrous sulphate** 200 mg once daily
- **SP 3** tablets stat at the first antenatal visit after quickening
  - Repeat at an interval of at least 4 weeks (1 month)
  - HIV infected pregnant women must have 3 courses of SP

Pregnant women who are HIV-positive and are also taking daily cotrimoxazole prophylaxis should NOT be given SP.

- **Vitamin A** (retinol) 200,000 units single dose, ideally day 2 *after* delivery, or anytime within the first 2 months after delivery
- Check haemoglobin antenatally. If ≤ 9g/dl refer to hospital. If ≥9 g/dl give **Ferrous sulphate** and **Folic acid** as above**.** If no response then refer.

At the hospital

- The following tests should be done
  i. Full blood count
  ii. Stool and urine analysis
  iii. Peripheral blood film
  iv. Malaria parasite check
  v. HIV test

12.3 Tetanus Toxoid Vaccination (TTV)

- All pregnant women should receive TTV

Table 21: Schedule of TTV Doses

TTV	Dose	Time
TT1 (1st dose)	0.5ml s/c or i/m	Give at any contact with woman of child bearing age (15-45 years) including at 1st antenatal visit
TT2 (2nd dose)	0.5 ml s/c or i/m	At least 4 weeks after TT1
TT3 (3rd dose)	0.5 ml s/c or i/m	At least 6 months after TT2 or during a subsequent pregnancy
TT4 (4rd dose)	0.5 ml s/c or i/m	At least 1 year after TT3 or during a subsequent pregnancy
TT5 (5rd dose)	0.5 ml s/c or i/m	At least 1 year after TT4 or during a subsequent pregnancy

12.4 Vaginal Candidiasis (moniliasis)

- Common infection occurs more frequently in patients taking antibiotics, pregnancy, HIV/AIDS patients and patients with diabetes.

Treatment

Adults:

- **Clotrimazole** 500mg intravaginally as single dose or **Clotrimazole** 200mg intravaginally once daily for 3 days

Alternatively

- **Miconazole 200mg** intravaginally once daily for 3 days or
- **Fluconazole 150mg** orally as single dose (contra-indicated in pregnancy) or
- **Nystatin pessary 100,000 IU** vaginally every 12 hours for 7 days

To avoid re-infecting her partner, the male partner should:

- Apply **aqueous gentian violet paint** 0.5% to the penis every 12 hours for 7 days
- Recurrent vulvalvaginal candidiasis should be refered to hospital

12.5 Dysmenorrhoea

Treatment

- **Mefenamic acid** 500mg every 8 hours during menses for not more than 7 days

Alternatively

- Other analgesics *see Section 24.1 page 196*

If no response:

- Cyclical courses of **low oestrogen combined contraceptive** tablets once daily for 3 – 6 months

If there is still no improvement

- Refer to hospital

12.6 Hypertensive disorders in pregnancy

- Blood Pressure ≥ 140/90mmHg
- Repeat Blood Pressure check after 4-6 hours

If still raised:

- Refer to hospital

At the hospital

- Admit
- Exclude pre-eclampsia

12.6.1 Pregnancy Induced Hypertension (PIH)

- *Symptoms and signs*: raised BP ≥ 140/90mmHg, ± oedema, proteinuria ≥+ dipstick, gestation ≥ 20 weeks

Treatment

a) If no signs of pre-eclampsia then

- **Methyldopa** 500mg – 1g every 8 hours until BP settles
- Review weekly

b) If more than two signs of pre-eclampsia referpatient to hospital

At the hospital

- Admit , evaluate and take full history,
- Check for signs of imminent eclampsia, check weight,urine dip stick daily, and BP every 4 hours
- Evaluate well being and gestatation. Do ultrasound

If diastolic BP >90mm Hg and <110mm Hg then

- **Methyldopa** 500 - 1g every 8 hours review daily

If diastolic >110mm Hg

- Do not lower BP abruptly
- **Hydralazine** 5mg i/v slowly over 5 min.
- Repeat every 20 minutes until diastolic pressure is below110 mm Hg.

- Then give **Hydralazine** 40mg i/v in 1 litre over 8 hours to maintain BP at below 110 mmHg

Alternatively

- **Nifedipine** 10mg. Recheck BP in 20 minutes. Repeat nifedipine if diastolic ≥110mmHg. Consult specialist.
- Watch carefully for eclampsia: If this develops *see section for eclampsia for treatment*
- *Consider delivery regardless of gestational age if:*
  - BP is difficult to control
  - Urine output is decreasing
- Critical signs/symptoms persist (suggesting severe pre-eclampsia)
- Develops eclampsia

12.6.2 Pre-eclampsia

- *Symptoms/Signs:* Bp> 150/100, marked oedema, proteinuria ++/+++, headache, blurred vision,epigastric pain, oliguria, hyper-reflexia
- Refer to hospital any woman with severe preeclampsia accompanied by nurse incase the patient starts convulsing

If >34 weeks gestation:

- Stabilize patient
- Deliver within 24 hours either by induction, if cervix is favourable, or by caesarean section

If<34 weeks gestation:

- Inform CO/MO/Specialist
- Assess fetal well being using Ultrasound scan or Cardiotocograph
- Give **Dexamethasone** 6mg every twelve hours i/m for 4 doses

Alternatively

Betamethasone 12mg i/m once daily for a total of 2 doses

Check

i. Full blood count, Urea & creatinine in serum
ii. liver function tests
iii. Electrolytes: sodium, potassium, and chloride

If diastolic BP >90mmHg

- **Methyldopa** 500mg – 1 g every 8 hours
- Give oxygen by mask
- Ensure close monitoring of vital signs and fetal heart

- Strictly monitor fluid intake, and record output (through a Foley's catheter)
- Consider delivery after administering corticosteroids

Note:

a) Consider prophylactic magnesium sulphate use for severe preeclampsia
b) If need arises for prophylactic magnesium sulphate, delivery must be effected within the next 48-72 hours.
c) Diuretics are discouraged in pregnancy except for cardiac disease

If the patient convulses treat as eclampsia

12.6.3 Eclampsia

- Convulsions in a woman with pre-eclampsia. Convulsions can occur prior to labour, intrapartum or postpartum.
- Convulsions **also do occur** without previous symptoms
- Before starting treatment for eclampsia, be *absolutely sure to exclude:*
  - Epilepsy
  - Meningitis
  - Cerebral malaria

Initial management:

- Prevent the patient from hurting herself
- Secure airway, aspirate secretions or vomitus
- Control convulsions with magnesium sulphate see dose below
- Refer to hospital as soon as possible accompanied by a nurse
- Give adequate oxygen supply by nasal prongs or face mask

Treatment

- At health centre give loading dose of **magnesium sulphate** 4 g of 20% solution in 500 ml of normal saline infused over 10 minutes plus 5 g of 50% solution in each buttock deep i/m
- Refer immediately
- Closely monitor the respiratory rate (not less than 16), patella reflexes and urinary output should not be less than 25mls an hour.
- Continue magnesium sulphate for 24 hours post delivery or 24 hours after the last convulsion whichever was the last
- **Maintenance dose**: Magnesium sulphate 5 g of 50% solution every 4 hours deep i/m till 24 hours post-delivery or 24 hours after the last convulsion which ever was the last.
  {Addition of 1.0ml of 2% lidocaine minimizes discomfort}

Note:

a) Once magnesium sulphate is administered a decision must be made to deliver the pregnant woman within 12 hours

- *If magnesium sulphate is not available give:*
  - Loading dose of **Diazepam** 10mg i/v slowly over 2 minutes
  - Maintenance dose of **Diazepam** 40mg in 500mls of normal saline or ringer's lactate
  - Do not give more than 100mg in 24 hours
  - Refer the patient to hospital

In case of magnesium sulphate toxicity administer calcium gluconate 1gm as i/v stat dose and stop magnesium sulphate

Mode of delivery:

- Carry out an obstetric assessment to decide on appropriate mode
- Only allow assisted vaginal delivery if labour is progressing quickly
- Consider caesarean section if unlikely to deliver in 6-12 hours regardless of gestational age
- Give **Oxytocin** 10 IU (1mL amp) by i/v push in the 3rd stage
- Do not use ergometrine

Monitoring:

- Continue careful observation (and treatment if necessary) for at least 48 hours after delivery

12.7 Prelabour rupture of membranes

- Rupture of the membranes before labour has begun
- *Symptoms/Signs:*Watery vaginal discharge

(a) If gestation less than 34 weeks

- *No* digital vaginal examination should be done
- *When the diagnosis is in doubt,* perform sterile speculum examination
- Check temperature 4 hrly, inspect liquor daily, assess fetal heart rate
- Give prophylactic antibiotics:
  - **Erythromycin** 250 mg orally every 8 hours for 7 days
  - **Metronidazole** 400 mg orally every 8 hours for 7 days
- Give corticosterioids:

- **Betamethasone** 12 mg i/m, 2 doses 24 hours apart;

Alternatively

- **Dexamethasone** 6 mg i/m 4 doses 12 hours apart

- If still draining, deliver at 34 weeks if there are no other contraindications
- *If signs of intra-uterine infection develop* (temperature 37.5 ºC or more, purulent or offensive liquor, fetal tachycardia), inform the most senior person available, who should plan urgent delivery regardless of gestatal age

(b) ***If*** gestation 34 weeks or greater

- Do sterile speculum exam to confirm draining and rule out cord prolapse
- If membranes have been ruptured for more than 18 hours, give prophylactic antibiotics:
  - **Ampicillin** 2 g i/v every 6 hours

Alternatively

- **Benzylpenicillin 2 million units** i/v every 6 hours until delivery
- Stop 48 hour after delivery unless there are signs of sepsis
- If labour does not begin spontaneously within 24 hours, assess the cervix and induce labour, if no contraindication to vaginal delivery. If unsuccessful deliver by ceasarean section
- If signs of intra-uterine infection develop (temperature 37.5 ºC or more, purulent or offensive liquor, fetal tachycardia), inform the most senior person available, to decide on mode of delivery

12.8 Chorioamnionitis

- Intra-uterine infection

Symptoms/Signs: foul-smelling vaginal discharge after 28 weeks of pregnancy, fever/chills, abdominal pain, fetal tarchycardia

Treatment

- **Benzylpenicillin** 2.5 MU i/v stat and/or
- **Chloramphenicol** 500 mg i/v stat

Refer to hospital

At hospital

- Give **Metronidazole** 500mg i/v 8 hourly, and
- **Benzylpenicillin** 2 MU i/v every 6 hours and

- **Gentamycin 240** mg i/m single dose daily or **Chloramphenicol** 500mg 6 hourly
- Continue for 48 hrs after the fever subsides, but not less than 5 days.
- Deliver urgently**.** Induce or accelerate labour with **Oxytocin**; do ceasarean section if necessary.
- If mother has amnionitis or if membranes were ruptured for more than 18 hours before delivery, start newborn on
  - **Benzylpenicillin** 50,000 IU/kg/dose i/m every 12 hours and
  - **Gentamycin** 5 mg/kg i/m once daily for 5 days if birth weight >1500 g).

12.9 Mastitis

General Measures

- Apply hot compresses and a constriction bandage to support the breast and relieve pain.
- Maintain lactation in the infected breast if there are no nipple fissures to prevent stasis
- In severe cases, avoid engorgement by reducing milk production

Treatment

- **Flucloxacillin** 500 mg every 6 hours for 7 days
- Doses should be taken at least 30 minutes before meals

Alternatively

- **Erythromycin** 500mg 8 hourly for 5 – 7 days
- **Aspirin** 600 mg after food every 6 hours as needed

12.10 Breast abscess

- If breast abscess forms, drain surgically.
- Change dressing everyday
- Give treatment as above

12.11 Postpartum haemorrhage (PPH)

- Blood loss from the genital tract of more than 500ml after delivery of a baby.
- *Causes:* uterine atony, retained products of conception, Genital tract trauma, coagulation problems, ruptured uterus
- Always actively manage the 3rd stage of labour

Treatment

- **Oxytocin** 10 units im given after delivery of the anterior shoulder and controlled cord traction for delivery of placenta

12.11.1 Primary PPH

- Abnormal vaginal bleeding within 24 hours of delivery
- Resuscitate: *Refer to Section 1.2 page 1*
  - Set up an i/v line and empty bladder
  - Replace blood loss with i/v fluids / blood
- Identify and treat the cause
- *If uterine atony:*
  - Rub up a contraction
  - Set up **Oxytocin** 40 units infusion
  - Give **Misoprostol** 1000mcg rectally
  - Refer to hospital with nurse
- *If retained placenta*
  - Attempt manual removal
  - Refer to midwife if this fails

12.11.2 Secondary PPH

- Abnormal bleeding 24 hours or more after delivery
- Not common but is as serious as primary PPH
- *Causes:* retained products, often with infection

Treatment

- Set up an i/v line
- Empty bladder
- Rub up a contraction
- **Oxytocin** 10 units i/m
- Replace blood loss with i/v fluids/blood *(see Section 1.1 page 1)*
- Refer immediately for evacuation of the uterus

Supportive measures

- **Amoxycillin** 500 mg every 8 hours plus **Metronidazole** 400 mg every 8 hours

Alternatively if penicillin sensitive

- **Erythromycin** 250 mg every 6 hours
- Assess the need for blood transfusion
- Give i/v fluids to sustain a high degree of perfusion

If the patient is toxic start i/v antibiotics as follows:

- **Metronidazole** 400 mg every 8 hours plus
- **Gentamycin** 4.0mg/kg body weight i/m stat
- **Benzyl penicillin** 2 MU i/v every 6 hours

12.11. Post-abortal haemorrhage

- Assess patient, record vital signs
- Insert i/v line
- Resuscitate and stabilize the patient *(see Section 1.1 page 1)*
- Carry out vaginal examination
- Remove products of conception and/or foreign bodies
- **Oxytocin** 10 units i/m
- Perform (or if not possible refer) evacuation or manual vacuum aspiration (MVA) if gestation < 12 weeks

If septic treat as in *Section 12.12* below

12.12 Post abortal or puerperal sepsis

- Maintain hydration: set up an i/v line and give i/v fluids *(see Section 1.1 page 1)*
- **Paracetamol** 1 g stat
- **Benzyl penicillin** 5 MU i/v stat
- **Oxytocin** 10 units i/m to contract uterus
- Counsel the patient
- Refer for evacuation of the uterus to hospital with the midwife, blood samples, patient's records

At hospital:

- Give **analgesic** for pain (see *Section 24.1 page 196*)
- Repeat as required to maintain uterine contraction
- Give antibiotic treatment for 7 days as follows:

For sepsis:

- **Metronidazole** 400 mg every 8 hours plus
- **Gentamycin** 4.0mg/kg body weight i/m stat
- **Benzyl penicillin** 2 MU i/v every 6 hours
- Consider uterine evacuation in some cases

If not improving:

- Reassess and consider the appropriate intervention:
- Change of antibiotics

- Re-evacuation
- Laparotomy
- Referral to central hospital

12.13 Contraceptives

- *Types*: combined hormonal contraceptives, progestogen only contraceptive, contraceptive devices, emergency contraceptive, barrier methods.

12.13.1 Combined hormonal contraceptive (COCs)

- Most effective preparations for general use.
- Contain an oestrogen and a progestogen.
- Choose a preparation with the lowest oestrogen and progestogen content which gives good cycle control and minimal side effects in the individual woman.

Indications

- Contraception
- Menstrual disturbances

12.13.2 Progestogen only contraceptive

- Suitable alternative when oestrogens are contraindicated
- Have a higher failure rate than COCs.
- Suitable for hypertensive women, migraine, valvular heart disease and diabetes mellitus.
- Menstrual irregularities (oligomenorrhoea, menorrhagia) are more common but tend to resolve on long term treatment.

Dose

- 1 tablet daily at same time each day starting on day 1 of the menstrual cycle

12.13.3 Parenteral progestogens

- Injectable preparations e.g. Depo-Provera®
- Implant preparations e.g Jadelle® and Norplant®

12.13.4 Intrauterine progestogens

Indications

- Contraception

- Menstrual disturbances

12.13.5 Non hormonal intrauterine contraceptive device

- Increased risk of PID

Indications

- Contraception after delivery, after an abortion and evacuation, at the end of menstruation and emergency contraception
- Examples: Copper T 380®

12.13.6 Emergency Contraception

- Effective if taken within 72hrs of unprotected intercourse.
- Give Lofeminol® 4tablets every 12 hours for 24 hrs.
- If vomiting occurs within 3hrs of taking hormonal tablet, give replacement dose and anti-emetics can be considered.
- Explain the following:
  - The next period may be early or late
  - A barrier method needs to be used until the next period.
  - Patient should return promptly if lower abdominal pains develop to rule out ectopic pregnancy or of any problems.
  - An intrauterine contraceptive device can be inserted up to 5 days of unprotected sexual intercourse.

13.0 Ophthalmic Conditions

13.1 Conjunctivitis

- Bacterial or viral conjunctivitis is highly contagious and personal hygiene is important in prevention and treatment
- Advise the patient to:
  - Use only his/her own towels
  - Wash the face and cleanse the eyes frequently
  - Wash hands thoroughly before applying eye ointment
- Treat unilateral conjunctivitis with special care to avoid spread of infection to the other eye

Treatment

- Apply **Tetracycline eye ointment** 1% every 8 hours for 7 days
- For neonates, *see Section 13.3 below*

13.2 Foreign body in the eye (superficial injury)

- Detect foreign body with 1 drop of **Fluorescein eye drops** 1%

Treatment

- Apply 1 drop of **Amethocaine eye drops** 1% to anaesthetize the eye
- Remove foreign body carefully with a cotton bud
- Apply **Tetracycline eye ointment** 1% every 8 hours for 7 days

13.3 Ophthalmic neonatorum

Treatment

- **Gentamycin** 4 mg/kg i/m single dose
- Carefully clean away any discharge from the eyes
- Apply **Tetracycline eye ointment** 1% to each eye every 6 hours for 3 days

Alternatively

- Instill 1-2 drops of **Gentamycin eye drops 0.3%** into each eye every 2 hours
- Reduce the frequency as the infection is controlled
- Continue for 48 hours after condition is cleared
- Combined topical therapy may be used as follows:
  - Instill **Gentamycin eye drops** 0.3% during the daytime
  - Apply **Tetracycline eye ointment** 1% at night
  - Continue for 48 hours after condition is cleared

13.4 Trachoma

Treatment

- **Tetracycline eye ointment** 1% every 8 hours for 6 weeks

14.0 Oral and Maxillofacial Conditions

14.1 Candidiasis/Oroesophageal

- **Nystatin oral suspension/ pessaries** 100,000 units every 6 hours for 10-14 days

Note: pessary should be sucked and taken after food

- Review after 14 days
- Paint **Gentian violet** aqueous solution 0.5 % on the lesions 3 times daily for 7 days
- **Clotrimazole troches** 10 mg every 8 hours for 4 weeks (children)

Alternatively

- **Chlorhexidine 0.2 %** mouth rinses three times a day (should **not** be used together with **Nystatin)**

If not resolved after 7 days:

- Continue with above treatment and add
- **Ketoconazole** 200-400 mg twice a day for 10-14 days
  - Children: 1- 4 years: **Ketaconazole 50** mg every twelve hours for 10 – 14 days
  - Children: 5-12 years: **Ketaconazole 100** mg every twelve hours for 10 -14 days

Note:

Ketoconazole interacts with the following ARVs: Nevirapine, protease inhibitors and Didanosine

Alternatively

Adults

- **Fluconazole** 50-100 mg every 6 hours for 14 days

Children

- **Fluconazole** 6 mg/kg on day 1, then 3 mg/kg every 6 hours for 13 days

Prophylaxis:

Adults

- **Fluconazole** 100 mg daily for long term

Children

- **Fluconazole** 3-6 mg/kg daily for long term

14.2 Caries, Toothache

Treatment

- Depends upon the extent of caries and clinical judgment:

(a) If minimal and confined to the enamel

- Apply topical **Fluoride**

(b) If in enamel and dentine but not involving the pulp

- Filling

(c) If involving the pulp and there is periapical infection and/ or pulp inflammation

- Root Canal Therapy

(d) If severe

- Tooth extraction

Note: Antibiotics are not indicated unless there is infection

Reinforce oral hygiene practices including use of fluoridated toothpaste to all patients

14.3 Dental Abscess

Treatment:

- Consider incision and drainage
- **Amoxycillin** 250-500 mg every 8 hours for 7 days *or*
- **Benzyl penicillin** 1-2 MU (Children: 25,000 units/kg/dose) i/m or i/v every 6 hours for 7 days

Alternatively

- **Erythromycin** 250-500 mg every 6 hours for 7 days (if allergic to penicillins) and
- **Metronidazole** 200-400 mg (Children:7.5 mg/kg/dose) every 8 hours for 7 days
- **Metronidazole** 250-500 mg i/v every 8 hours for 7 days
- **Aspirin** 300mg every 8 hours

14.4 Gingivitis

Treatment

- Reinforce oral hygiene practices; i.e, brushing at least twice a day to remove plaque; in the morning after breakfast and in the evening before going to bed
- Conventional therapy; scaling and cleaning to remove all tooth surface adherents
- Antibiotics are **not** indicated unless one has acute Necrotizing Ulcerative Gingivitis (ANUG) or Linear Gingival Erythema (LGE)

14.5 Periodontal abscess

Treatment

- Give antibiotics as for dental abscess
- Reinforce oral hygiene practices
- Scaling and polishing

14.6 Periodontitis

Treatment

- Root planing +/- antibacterial irrigant (tetracycline)
- Reinforce oral hygiene practices
- Antibiotics are **not** indicated unless the following exists:
    - Necrotizing ulcerative Periodontitis (NUP)
    - Exudate discharging from the periodontal pockets
    - Patient is non-responsive to conventional therapy
    - Juvenile Periodontitis
    - Aggressive Periodontitis

14.7 Odontogenic and Maxillofacial infections

Symptoms/Signs: Patients who present rapid progressive swelling, difficulty in breathing, difficulty in swallowing (dysphagia), facial space involvement, elevated temperature, severe jaw trismus (< 10 mm), toxic appearance, compromised host defenses

Treatment

- Incision and drainage
- Removal of the cause
    - Extraction of the offending tooth or
    - Treat the tooth endodontically with root canal therapy
    - Sequestrectomy (removal of necrotic bone)
- Keep patient hydrated
- Give analgesics for pain relief
- Encourage high-calorie food intake
- Prescribe appropriate antibiotics for rapidly progressive swelling as follows:
    - **Amoxycillin** 250-500 mg every 8 hours for 7 days *or* **Benzylpenicillin** 0.5-2.0 MU i/m or i/v every 6 hours for 7 days
    - **Metronidazole** 200-400 mg every 8 hours for 7 days or Metronidazole 250-500 mg i/v every 8 hours for 7 days

- **Tetracycline** 250 mg every six hours or 500 mg twelve hourly for 7 days
- **Erythromycin** 250-500 mg every 6 hours for 7 days
- **Clindamycin** 150-300 mg

Note: Antibiotics are indicated for diffuse swelling, compromised host defenses, involvement of fascial spaces, severe pericoronitis, osteomyelitis

14.8 Local Anaesthesia Toxicity in Dental Surgery

14.8.1 Mild Local Anaesthetic toxicity

- *Symptoms/Signs*: talkativeness, anxiety, slurred speech, confusion

Treatment

- Stop administration of local anaesthetic
- Monitor vital signs
- Observe for 1-hour

14.8.2 Moderate Local Anaesthetic toxicity

- *Symptoms/Signs:* stuttering speech, nystagmus, tremors, headache, dizziness, blurred vision, drowsiness

Treatment

- Place in supine position
- Monitor vital signs
- Administer oxygen
- Observe for 1-hour

14.8.3 Severe Local Anaesthetic toxicity:

- *Symptoms/Signs*: seizure, cardiac dysrythmia or cardiac arrest

Treatment

- Place in supine position
- If seizures, protect from nearby objects,
- Suction oral cavity if vomiting occurs
- Administer oxygen
- Give **Diazepam** 5-10 mg i/v slowly as stat dose
- Transport to emergency care facility/ Intensive care unit
  - Monitor vital signs

- Summon for medical assistance

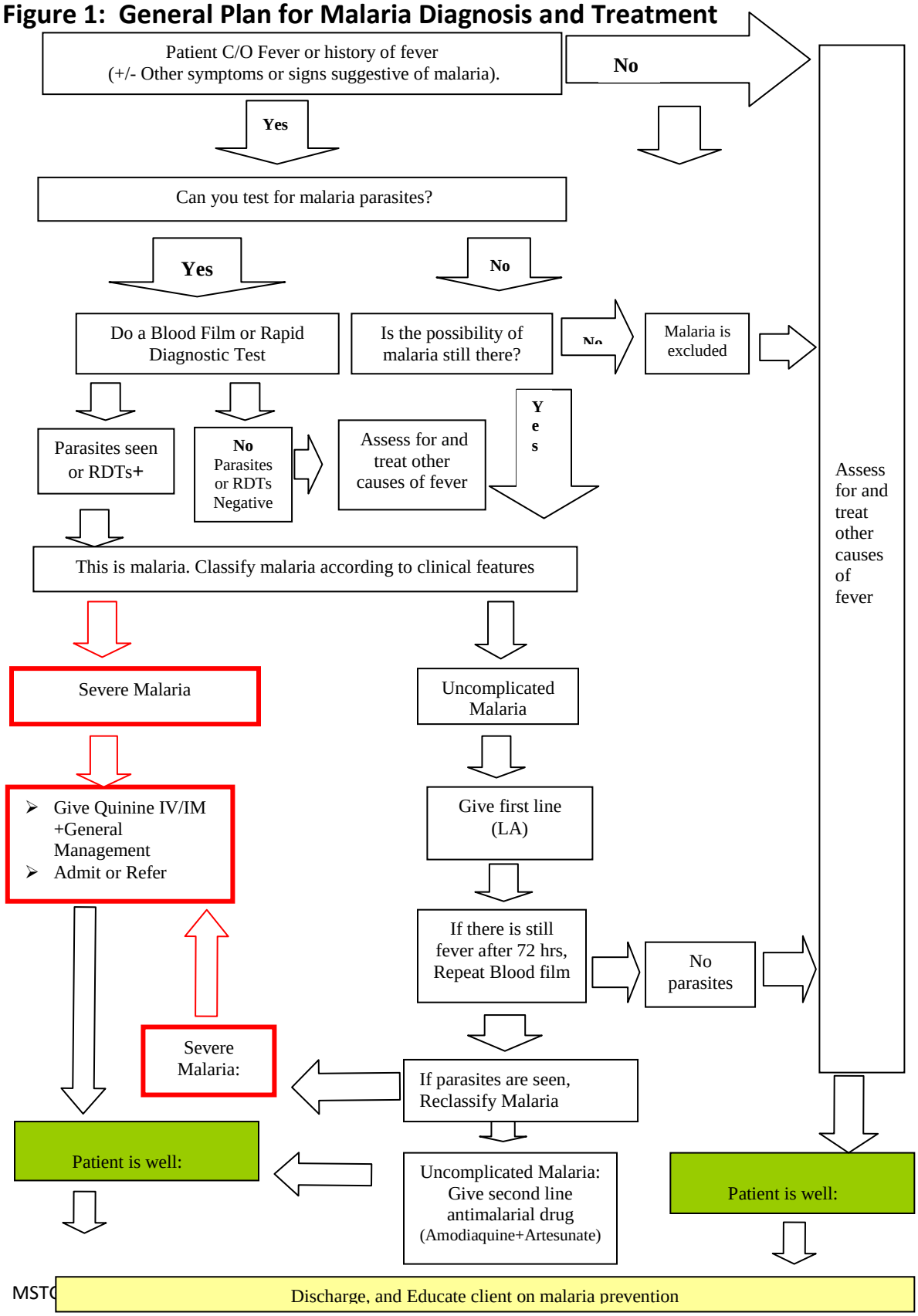
14.9 Mouth Ulcers (Sores)

- If related to HIV infection, please refer to section on *Management of the HIV-Related Diseases,*
- All ulcers in the mouth regardless of the HIV-status, lasting more than three weeks, should be referred for further management

15.0 Parasitic diseases

15.1 Malaria

Figure 1: General Plan for Malaria Diagnosis and Treatment



15.1.1 Malaria, non-severe, uncomplicated

- Refer to the MOHP National Malaria Control Programme publication **Guide for the Management of Malaria, October 2007,** for full details of malaria management
- *Diagnosis:* Made by microscopic examination of blood film wherever possible or alternatively by rapid diagnostic tests (RDTs). Indications for testing for malaria include: fever or recent history of fever, and any illness that can be a malaria complication (coma, convulsions, anaemia, jaundice etc.)
- Indications for repeating a diagnostic test (film or RDT) include:
    a) if the first test was positive and there is persistent fever or worsening condition despite suitable antimalarial treatment.
    b) if the first test was negative and antimalarial treatment was not given, but the patient's fever persists or condition deteriorates.
- Where microscopy or RDT is available, only treat adults for malaria if confirmed by a positive malaria test. When microscopy and RDT are both not available, treat on the basis of presumptive diagnosis
- *Presumptive diagnosis in children < 5 years old:* in the absence of laboratory confirmed diagnosis, consider a (history of) fever in the absence of other causes to be malaria**.** Additional suggestive signs of malaria include splenomegaly and anemia

Treatment:

- First line treatment is **Lumefantrine** 120mg**/Artemether** 20mg (LA)

Table 22: Dosage Schedule for Lumefantrine-Artemether (LA -120mg/20mg tablets)

Body weight in Kg (age in years)	No. of tablets at approximate timing of dosing					
	Day 1		Day 2		Day 3	
	Start dose	After 8 hrs	AM	PM	AM	PM
5-14.9 kg (<3)	1	1	1	1	1	1
15 – 24.9 kg (≥ 3-8)	2	2	2	2	2	2
25 – 34.9 kg (≥9-14)	3	3	3	3	3	3
≥ 35 kg (>14)	4	4	4	4	4	4

- First dose should be given as DOT. If vomiting occurs within I hour, repeat the dose.
- Dose is given according to body weight
- If possible each dose should be taken with milk, which improves the absorption of lumefantrine component of the combination.
- If fever persists beyond 72 hours, do a blood tests (film or RDT), and if the result is positive, give second line treatment.

Table 23: Dosage Schedule for Artesunate-Amodiaquine

Weight	Daily dose for 3 days Amodiaquine (153mg)	Daily dose for 3 days Artesunate (50mg)
5.0 – 6.4 kg	½	½
6.5 – 11.4 kg	1	1
12.0 – 24.9 kg	2	2
25.0 – 34.9 kg	3	3
≥ 35 .0 kg	4	4

15.1. 2 Severe Malaria

- Most severe malaria occurs in children under 5 years of age.

Table 24: Clinical manifestations and some laboratory findings

Clinical manifestations (Recognizable at Health Centre)	Some laboratory findings at referral hospital
❖ Impaired level of consciousness (cerebral malaria) ❖ Respiratory distress (acidotic breathing) ❖ Repeated convulsions ❖ Circulatory collapse ❖ Pulmonary oedema ❖ Abnormal bleeding ❖ Jaundice ❖ Haemoglobinuria ❖ Prostration	❖ Severe anaemia: (Hb<5 g/dl) ❖ Hypoglycaemia: (<2.2mmol/l - <40mg/dl) ❖ Hyperlactataemia (lactic acidosis) ❖ Hyperparasitaemia: (250,000/l or ring stage≥ 5% of RBCs) ❖ Electrolytes imbalance (e.g. Hyponatraemia)

- Although most children with malaria have a (history of) fever, this may be variable in patients who have progressed to severe malaria
- Examine children with suspected severe malaria for other conditions (e.g. pneumonia,meningitis) as a possible cause of their symptoms and, if found, manage appropriately
- If severe malaria is diagnosed in an out-patient, refer the child for hospitalization (see below)

15.1.2.1 Pre-referral treatment at peripheral units

- Refer any patient with severe malaria to the nearest hospital
- Give **quinine** 20mg (0.2ml) per kg body weight i/m into the upper outer thigh. If the volume to be injected exceeds 3ml (see below), give half into each thigh
- Where there is no scale, weight of the child can be estimated as follows:
    a. For children of 3months to 12months old
    Weight (Kg) = Age (months) + 9/2

    b. For children of 1 year to 6years old
    Weight (Kg) = [Age (in years) x 2] + 8

- Use a 10ml sterile syringe to draw 5 ml of sterile water for injection, then into the same syringe draw up 300mg (1 ml) from an ampoule of quinine. The syringe now contains 50mg of quinine per ml.
- Give 0.4ml/kg of this solution as the first (loading) dose - this is 20mg/kg. Subsequent (12-hourly) doses should each be 0.2ml/kg (10mg/kg). The dose of quinine for an adult at any one time should not exceed 1,200mg.

Injectable quinine should be for patients unable to take oral drugs.

Table 25*: Dosage of Parenteral Quinine per body weight*

Body weight	Quinine (ml)	Number of injection sites
Under 5 kg	1.0 ml	1
5.1 – 7.5 kg	1.5 ml	1
7.6 – 10.0 kg	2.0 ml	1
10.1 – 12.5 kg	2.5 ml	1

12.6 – 15.0 kg	3.0 ml	1
15.1 – 17.5 kg	3.5 ml	2
17.6 – 20.0 kg	4.0 ml	2
20.1 – 22.5 kg	4.5 ml	2
22.6 – 25.0 kg	5.0 ml	2
25.1 – 27.5 kg	5.5 ml	2
27.6 – 30.0 kg	6.0 ml	2
30.1 - 32.5 kg	6.5 ml	3
32.6 - 35.0 kg	7.0 ml	3
35.1 - 37.5 kg	7.5 ml	3
37.6 - 40.0 kg	8.0 ml	3
40.1 - 42.5 kg	8.5 ml	3
42.6 - 45.0 kg	9.0 ml	3
45.1 - 47.5 kg	9.5 ml	4
47.6 - 50.0 kg	10.0 ml	4
50.1 - 52.5 kg	10.5 ml	4
52.6 - 55.0 kg	11.0 ml	4
55.1 - 57.5 kg	11.5 ml	4
57.6 - 60.0 kg	12.0 ml	4
> 60 kg	12.0 ml	4

15.1.2.2 Additional management and supportive measures

- Reduce fever:
  - Tepid sponging with lukewarm (not cold) water
  - Give an antipyretic (paracetamol 10 mg/kg; 6 to 8-hourly) as required until fever is reduced. *See dose tables in Section 10.1 page 91*
- Ensure adequate fluid intake:
  - if the patient can drink: give ORS 20 mL/kg plus one added teaspoon of glucose powder or sugar
  - if the patient cannot drink: use nasogastric tube to provide this fluid

Repeat this after 2-4 hours

15.1.2.3 Management of Severe Malaria Patient in Hospital Setting

Consider the following (8-8-8) points in the management of patients with severe malaria.

Box 1: Take 8 immediate measures:

1. Start resuscitation, particularly maintenance of a patent airway.
2. Establish i/v line.
3. Make a thick blood smear for immediate malaria parasite count, (if microscopy is not available, an RDT may be useful to indicate whether malaria infection is present or not)
4. Classify the degree of dehydration, assess patient's fluid requirements and correct accordingly.
5. Control fever if the axillary temperature is 38.5ºC or above: *Tepid sponging and oral or rectal paracetamol (15mg/kg every 4 to6 hours)*
6. Control convulsions: maintain airway, treat with rectal diazepam (0.5mg/kg) or slow IV diazepam (0.3mg/kg, maximum 10mg in an adult), or paraldehyde 0.1ml/kg IM. Remember to correct any hypoglycaemia or hyperpyrexia in a convulsing patient.
7. Detect and treat hypoglycaemia: hypoglycaemia can be induced by high parasitaemia, fasting and quinine therapy. Hypoglycaemia can recur especially in pregnant women and children. If blood glucose ≤3mmol/l or ≤54mg/dl; give 1ml/kg of 50% dextrose IV, diluted with an equal volume of 0.9% saline or 5% dextrose, give slowly over 3-5 minutes, and check blood glucose after 30 minutes and as required after treatment. Follow with 10% dextrose infusion at 5ml/kg/hr. If there is no test for blood glucose, treat as if the patient is hypoglycaemic.
8. Start Quinine i/v or i/m (if i/v not accessible), see below for dosage details.

Box 2: Look for and deal with the following 8 complications:

1. **Shock**: if cold peripheries, delayed capillary refill, or Systolic BP <50mmHg in children 1-5years or <80 mmHg in >5years, suspect sepsis. In such cases take blood samples for culture. Give parenteral broad-spectrum antimicrobials. Correct fluid disturbance. Treat with: 30ml/kg 0.9% Saline IV in 1 hour; then reassess. Give oxygen if possible.
2. **Altered consciousness and/or convulsions.** Check for hypoglycemia, hyperpyrexia and 'subtle' seizures. *In a comatose patient, convulsions (seizures) may be 'subtle' – i.e. minor movements [flicker of eyelid, mouth or finger] or unusual repetitive movements [a rhythmical cry, unusual breathing, 'pedalling' of legs].* If seizure suspected, treat as in item 6 in Box 1.
3. **Severe anaemia.** Consider the need for blood transfusion: Assess the degree of pallor (no pallor, some pallor or severe pallor – look especially at palms of hands, also mucous membranes). Assess signs that increase the danger of severe anaemia - respiratory distress, altered consciousness, shock and hyperparasitaemia.
   Note: *The decision to transfuse with blood should not only be based on low laboratory values, but on a full assessment of the patient**. As a guide, **all** patients with PCV<12% or Hb<4g/dl should be transfused, whatever the clinical state; those with any of the above danger signs may be transfused even if PCV is 13-18% or Hb 4-6g/dl.* **Use packed red cells in most cases; in shock or severe acidosis, use whole blood. The volume transfused should be 20 ml/kg.**
4. **Metabolic acidosis** (deep, fast breathing): **exclude or treat** hypoglycaemia, hypovolaemia and gram negative septicaemia. Give isotonic saline 20ml/kg of body weight rapidly or screened whole blood 10ml/kg if PCV <18% or Hb<6g/dl.
5. **Spontaneous bleeding** or coagulopathy: transfuse screened fresh whole blood, give vitamin K. 1 mg/day for infant, 2-3 mg/day for children and 5-10mg/day for adolescent, or adult. Vitamin K should be given s/c or i/m.
6. **Acute pulmonary oedema** in adults: prevent by avoiding excessive rehydration. Treatment: prop patient up; give oxygen. Stop IV fluids if pulmonary oedema is due to over-hydration, give a diuretic (frusemide i/v 40mg for adult and 0.5-1mg/kg/dose for children).
7. **Acute renal failure** in adults: detect this by monitoring fluid balance carefully. Identify and correct any dehydration or hypovolaemia. Maintain strict fluid balance. Consider peritoneal dialysis if oliguria persists beyond a few days.
8. **Common infections** and other conditions that present like severe malaria: Perform urinalysis, lumbar puncture (unless contraindicated), blood culture if possible, and chest x-ray.

Box 3: Monitor the following 8 observations:

Where possible use Critical Care Pathways (CCPs).

1. Level of consciousness (using coma score, see annex)
2. Vital signs every 4 hours (temperature, pulse, respiration, blood pressure)
3. Fluid balance (urine volumes, intake volumes – i/v and oral – puffy eyes, chest sounds)
4. Increasing anaemia (pallor, heart failure with increasing liver size)
5. Occurrence of convulsions – see item 2 in Box 2
6. Blood glucose every 4 hours while unconscious and also if convulsions occur.
7. [Hb]/Packed Cell Volume – at least daily, or more often if anaemia is suspected.
8. Ability to suck, drink, eat, sit, walk – measures of overall strength.

15.1.2.4 Management of severe malaria in paediatric in-patients

- Initial ('loading') dose of **quinine** 20 mg /kg body weight: inject this dose into 10ml/kg 5% dextrose or half strength Darrows and infuse over 3 – 4 hours.
- If patient has already received quinine for this illness, the first dose i/v infusion should be 10 mg/kg given over 3 – 4 hours without loading dose
- Subsequent doses of 10 mg/kg every 12 hours should be given in the same way
- Continue the same i/v fluid (10 ml/kg given over 3 – 4 hours) between doses of quinine
- Stop intravenous quinine as soon as the patient can drink, and give age/weight appropriate doses of **Lumefantrine - Artemether** (LA) twice daily for 3 days.

15.1.2.5 Management of severe malaria in adult in-patients

- Apart from cerebral malaria and anaemia, in adults other complications may develop such as:
  - Acute renal failure
  - Respiratory distress syndrome (presenting as severe breathlessness)
  - Disseminated intravascular coagulation (DIC) – presenting as prolonged or spontaneous bleeding
  - Jaundice from severe haemolysis or liver cell damage
- Management must be appropriate to each complication that develops. Fluid and antimalarial drugs are given as for children. If the patient cannot be weighed, i/v Quinine should be given as follows:
  - First dose **Quinine** 20 mg/kg (maximum 1.2 g) given over 3 – 4 hours
  - Subsequent doses **Quinine** 10 mg/kg every 12 hours given over 3 – 4 hours
  - IV fluids should be 5% dextrose in ½-strength Darrows or Ringer's lactate, or 5% dextrose, about 3 litres per 24 hours
  - Change to **Lumefantrine Artemether** (LA) twice daily for 3 days as soon as the patient can take oral medication.

15.1.3 Treatment of uncomplicated malaria in pregnancy

- In 1st trimester of pregnancy give oral Quinine 10mg /kg body weight, administered every 8 hours for 7 days.
- In 2nd and 3rd trimester give Lumefantrine Artemether (LA) twice daily for 3 days.

Note: Pregnant women are susceptible to hypoglycaemia when taking quinine.

15.1.4 Treatment of severe malaria in pregnancy

- Manage complication as for any adult
- Give **Quinine** 20mg/kg body weight loading dose, followed by 10mg/kg 12-hourly for 7 days, as follows:
- Start with i/v quinine in 10% glucose infusion or 5% glucose in normal saline
- If for some reason quinine cannot be given by infusion: give 10mg/kg dosage by i/m injection (table 4) and refer immediately. Make sure you give 10% glucose concentration or one bottle of 5% glucose before administration of quinine; be careful not to induce pulmonary oedema. Random blood sugar should be done before and after quinine administration.
- Shift to oral quinine (during 1st trimester) and LA (in 2nd and 3rd trimester) as soon as the patient can take medicines orally.

15.1.5 Malaria: selective chemoprophylaxis

- The appropriate regimen for an individual depends on the circumstances.

15.1.5.1 Risk groups

- The following high risk groups should be given antimalarial chemoprophylaxis:
  - Patients with immunosuppression caused by illness (e.g. Leukaemia, but not HIV infection or malnutrition) or splenectomy
  - Tropical splenomegaly syndrome
  - Under 5s with recurrent febrile convulsions
  - Individuals with sickle cell disease
  - Non-immune visitors (i.e. visitors from non-malarial countries)
  - Pregnant women

15.1.5.2 Antimalarial prophylaxis regimens

- **Mefloquine** (Lariam) 250 mg weekly.
  - Contraindicated in pilots, people with a history of cardiac disease, neurological disease or depression, and in those taking beta-blocking drugs.
- **Atovaquone-proguanil ('Malarone')** – one tablet daily. Taken for only one week after exposure ends.

- **Chloroquine** 300 mg - 2 tablets weekly. Should be combined with daily proguanil (see below). Chloroquine causes itching in 40% of black people.
  - Contraindicated in persons with psoriasis or epilepsy. Risk of retinal damage if taken every week for more than 6 years - advise a change!
- **Proguanil** (Paludrine®) 200 mg daily. Should combine with an additional drug such as weekly chloroquine.

15.1.5.3 Intermittent Presumptive Treatmnet of Malaria in pregnancy (IPTp)

- Intermittent Presumptive Treatment of malaria in pregnancy (IPTp) is one of the major malaria preventive strategies in Malawi.
- Give at least two doses of Sulphadoxine Pyrimethamine 525mg, 3 tablets for each dose, after the first trimester,
- The two doses should be given at least four weeks apart, under direct observation by health personnel.

15.2 Onchocerciasis (River blindness)

- Occurs mainly in highland areas such as Thyolo

Treatment

Adults and children > 5 kg:

- **Ivermectin** 150 mcg (0.15 mg)/kg single dose

Children<5 years: Should not receive Ivermectin. Instead give **Albendazole** 200mg

- Repeat annually or on return of symptoms
- No food for at least 2 hours before or after dosage
- Mothers should not breast-feed during treatment

Table 26: Ivermectin dose table

Weight (kg)	Height (cm)	Age (years)	No. of tabs*	Total (mg)
> 64	> 158	> 40	4	12
45-64	141-158	25-39	3	9
26-44	120-140	14-24	2	6
15-25	90-119	5-13	1	3
<15	<90	<5	n/r	n/r

*ivermectin 3 mg tablets n/r = not recommended

- Ivermectin is not recommended for
  - Pregnant women (or for those who think they might be) – it is often possible to delay treatment for a few months

- Breast-feeding mothers with babied < 1 week old
- Children < 5 years old (i.e. < 15 kg or 90 cm height)
- Seriously ill patients

15.3 Schistosomiasis (Bilharzia)

- Prevention may be achieved through:
  - Health education
  - Vector control
  - Improved sanitation and water supply
  - Modification of the environment, e.g. Clearing of vegetation in certain areas
  - Avoidance of re-infestation

15.3.1 Schistosomiasis haematobium

Treatment

- **Praziquantel** 40 mg/kg as a single dose
- Children below 4 years of age **Praziquantel** 20mg/kg as stat dose

15.3.2 Schistosomiasis mansonii

- Consider this diagnosis in cases of:
  - Unexplained chronic abdominal complaints with hepato-splenomegaly
  - Ascites with splenomegaly
  - Chronic bloody diarrhoea with no fever
  - Paraparesis/paraplegia
- Refer patients with above clinical features
- Treat after laboratory confirmation

Treatment

- **Praziquantel** 40 mg/kg as a single dose.
- Children below 4 years of age **Praziquantel 20mg/kg** as stat dose

15.4 Trypanosomiasis (Sleeping sickness)

- Suspect in any patient presenting with fever from areas near:
  - **Wildlife Reserves**: Vwaza, Nkhotakota, Majete, Mwabvi
  - **National Parks**: Kasungu, Liwonde, Lengwe
  - Phirilongwe (Mangochi), Machinga, Mwanza
  - Lower Shire borders with Mozambique or **from any other areas where** Tsetse fly is found

- Suspect in children from these areas who remain sick after presumptive malaria treatment
- Increased suspicion in any sick patient from these areas with a history of:
  - Headache
  - Vomiting
  - Weakness
  - Changes in mood
  - Convulsions
  - Drowsiness
  - Mental slowness
- Travel history is very important
- Suspect also in any patient from these areas where the cause of illness is not otherwise apparent
- Trypanosomiasis can be acute in children (resembling malaria) and can be more chronic in adults
- Early stage trypanosomiasis may cause myocarditis
- Examination may reveal anaemia, lymph gland enlargement and spleen enlargement
- Nearly all cases have a hard and painful subcutaneous nodule (chancre) which is evidence of an infected bite

15.4.1 Procedure at Health Centres

- Refer the patient immediately to the nearest hospital
- Request close family members of the patient to undergo examination at the hospital as they may also be infected

15.4.2 Hospital management

- Request for a thick blood smear
- If negative more tests will be needed to confirm this diagnosis
- If diagnosis is confirmed by blood smear or other blood test: Start **Suramin** as follows:
  - Day 1: 5mg/kg
  - Day 2: 20mg/kg
  - Day 3: do a lumbar puncture
- If LP is normal (stage 1 trypanosomiasis): give **Suramin** 20mg/kg on day 3, 10, 17, 24, 31
- If LP is abnormal (stage 2 or CNS trypanosomiasis): stop suramin, start **Melarsprolol (Mel-B)** as follows:

  - Day 3: 1.2mg/kg
  - Day 4: 2.4mg/kg
  - Day 5: 3.6mg/kg
  - Day 6: 3.6mg/kg
- Repeat this 4-day melarsprolol cycle after one and two weeks

Notes on treatment regimen

- If any medicine reaction occurs (e.g. skin rash, exfoliative dermatitis, reactive encephalitis) stop treatment and inform the clinical officer or medical officer immediately
- Do a lumbar puncture (LP) on day 3. Subsequent treatment depends on whether this is found to be normal or abnormal
- Freshly reconstitute the **Suramin (Sur)** 1 g vial of powder with 10 mL water for injection to make a 10% solution (100 mg/mL)
- Add the required dose of 20 mg/kg (0.2 mL of injection/kg) up to a *maximum of 1 g* (the whole vial) in adults of 50 kg or over to 200 mL of dextrose 5% and infuse over 2 hours. Alternatively give the dose as a slow i/v injection.
- **Melarsoprol (Mel B) dose** is 3.6 mg/kg (=0.1ml/kg). Give this as a slow i/v push. Take great care to avoid extravasation as the medicine is highly irritant. In adults of 50 kg or over the dose is the *maximum permissible 180 mg* (i.e. one 5 mL ampoule)
- **Prednisolone** may be added to melarsprolol with a dose of 40mg once daily. The dose in children is 1 mg/kg once daily
- Control any seizures with **Diazepam** 5-10 mg slow i/v with or without the addition of **Phenytoin** 150-300 mg as a single daily dose taken with water
- Anti-trypanosomal treatment may cause abortion in pregnancy, but this must be regarded as an unavoidable risk
- Follow-up: review the patient for repeat blood film and LP at 3, 6, 12 and 24 months post-treatment

15.5 Worm infestations

15.5.1 Ascaris, Enterobius, Ancylostoma, Trichuris Infestation

- Ascaris limbricoides = roundworm, Enterobius vermicularis = pinworm, Ancylostoma duodenale = hookworm, Trichuris trichiura = whipworm
- Hookworm can contribute considerably to anaemia especially in children

Treatment

Adults and Children > 2 years:

- **Albendazole** 400 mg single dose

Children below 2 years

- **Albendazole** 200mg

NOTE:

- Albendazole (and mebendazole) are contraindicated in pregnancy
- Heavy trichuris infections generally require treatment for 3 consecutive days
- In enterrobiasis, all family members must be treated concurrently

15.5.2 Strongyloides stercoralis infestation

A hyper-infection syndrome in immunosuppressed persons can occur and may be lethal and therefore requires specialist treatment.

Treatment

- **Ivermectin** 200mcg**/**kg daily for 2 days

Alternatively

Adults

- **Albendazole** 400 mg daily for 5 consecutive days

Children < 2 years

- **Albendazole** 200 mg daily for 3 consecutive days
- Check stool 3 weeks after treatment, at least 3 specimens
- Repeat above treatment if eggs or larvae still found

15.5.3 Taenia saginata/solium (tapeworm) infestation

Treatment

Adults

- **Praziquantel** 10 mg/kg stat

Children < 2 years

- **Praziquantel** 10 mg/kg stat

16.0 Respiratory Conditions

16.1 Acute respiratory infections (ARI) in children

- Most ARI are mild, self-limiting viral infections
- The Malawi ARI Control Programme emphasizes standard case management as its main strategy. This includes:
  - Early diagnosis
  - Appropriate drug use
  - Timely referral
  - Advice on suitable home care
- Refer to **ARI Control Programme Guidelines, MOHP 1998** for more information
- Refer to the **WHO's Management of the Child with Cough or Difficult Breathin**g for a summary of patient assessment, classification of illness and treatment instructions

ARI Case Management

1. Refer all cases for severe disease/pneumonia to hospital for admission after initial i/m doses of recommended antibiotics
2. Treat all pneumonia cases as out-patients with cotrimoxazole or amoxycilin
3. Do not use cough mixtures – they have no role to play in ARI management

16.1.1 Home care of children with ARI

16.1.1.1 Home care of child with ARI (2 mths – 5 yrs)

Advise mother to:

- Watch out for these danger signs (which may indicate pneumonia) and return quickly to the health facility if any occur:
  - Breathing becomes difficult
  - Breathing becomes fast
  - Child cannot drink
  - Child becomes more ill
- Feed the child
  - Continue feeding the child during illness
  - Increase feeding after illness
  - Clear blocked nose if interfering with feeding
- Increase fluids
  - If > 6 months old, offer the child extra fluids to drink

- Increase breast-feeding
- Soothe throat and relieve cough
  - Give sips of water or other (preferably warm) fluids
- Treat fever
  - Give paracetamol in the recommended dose every 6 hours until the high fever stops (see *Section 10.1 page 91*)
  - Increase fluids (see above)
  - Do not overdress or overwrap the child, i.e. keep the child lightly dressed
- Complete prescribed treatment
  - Complete this even if the child becomes better
- Return for follow-up assessment after 2 days if child is being treated for pneumonia.

16.1.1.2 Home care of child with ARI (young infant)

Advise mother to:

- Watch out for these danger signs and return quickly to the health facility if any occur
  - Breathing becomes difficult
  - Breathing becomes fast
  - Young infant not able to feed properly
  - Young infant becomes more ill
- Keep the young infant warm
- Breast-feed often
- Clear blocked nose if interfering with feeding

16.1.2 Common cold (nasopharyngitis)

- Coughs are commonly associated with colds
- Antibiotics should not be given
- Often causes fever in young children which may last up to 72 hours
- In infants, nasal discharge may interfere with breast-feeding and cause difficult in breathing
- Rule out pneumonia, otitis media, and streptococcal pharyngitis
  - Advise mother on how to correctly provide suitable home care (see *Section 16.1.1* page 132)

16.1.3 Sinusitis

- Most sinusitis is viral and self-limiting, requiring no antibiotics

- Pain in sinusitis is NOT an indicator of severity
- Steam inhalation may help drainage of blocked sinus
- Purulent nasal discharge may be caused by a foreign body in the nose
- Bacterial sinusitis is usually caused by S. pneumoniae or H. influenzae. It is characterized by:
    - Persistent purulent nasal discharge >7 days plus
    - Sinus tenderness and/or
    - Facial or periobital swelling and/or
    - Persistent fever
- Extract tooth under antibiotic cover **Benzathine penicillin** 1.2g i/m stat *or* **Amoxycillin** 3g orally stat 1hour prior to procedure *and* **Metronidazole** 400mg
- Only if there are definite signs of bacterial sinusitis give **Amoxycillin** 500mg every 8 hours for 7 days *or* **Phenoxymethylpenicillin** 500 mg every 6 hours for 7 days

Alternatively if penicillin hypersensitivity:

- **Erythromycin** 500 mg every 6 hours for 7 days

If there is pain or fever give:

- Analgesic/antipyretic treatment as required *see Section 10.1 page 91*

16.1.4 Pharyngitis, tonsillitis and its complications

- Most sore throats are due to viral infections such as adenovirus and CMV, and **should not be treated with antibiotics**
- For pain or fever give analgesic treatment as required *see Section 10.1 page 91*
- Be sure to rule out streptococcal pharyngitis to prevent acute rheumatic fever and other non-suppurative (endocarditis) and suppurative complications (retropharyngeal and peritonsillar abscesses).
- Signs suggestive of bacterial pharingitis are abrupt onset of pain, fever, tender, enlarged cervical lymph nodes, white or greyish pharyngeal exudates, absence of lower respiratory tract signs and symptoms absence of signs suggesting viral nasopharyngitis(e.g. rhinorrhoea, conjunctivitis, cough)

Do not use cotrimoxazole as it is not effective

Treatment
Adults:

- **Benzathine penicillin** 1.2 MU single dose i/m

Alternatively (if assured of compliance)

- **Phenoxymethylpenicillin** 500mg every 6 hours *or* **Amoxycillin** 500mg 8 hourly for 7 days

Alternatively in penicillin hypersensitive patients:

- **Erythromycin** 500mg every 6 hours for 7 days

Children > 30 kg:

- **Benzathine penicillin** 1.2 MU single dose i/m

Alternatively (if assured of compliance)

- **Phenoxymethylpenicillin** 250 mg every 6 hours or

Alternatively in penicillin hypersensitive patients:

- **Erythromycin** 500 mg every 12 hours

Children < 30 kg

- **Benzathine penicillin** 600,000 IU single dose i/m

Alternatively (if assured of compliance)

- **Phenoxymethylpenicillin** 12.5 mg/kg orally every 6 hours or

Alternatively in penicillin hypersensitive patients:

- Erythromycin 7.5-12.5 mg/kg orally every 6 hours

If there is pain or fever give analgesic treatment as required *see Section 10.1 page 91*

16.1.5 Peritonsillar and retropharyngeal abscesses

- Peritonsillar abscess (quinsy) and retropharyngeal abscess may cause difficulty in swallowing and tenderness at the angle of the jaw
- Consider these conditions if patient is unable to drink at all:

a) Peritonsillar abscess

Treatment

Adults

- **Phenoxymethylpenicillin** 500mg every 6 hours *or* **Amoxycillin** 500mg 8 hourly and
- **Metronidazole** 400mg every 8 hours

Alternatively

- **Benzylpenicillin** 2 MU i/v every 6 hours
- Switch when possible (usually after 48-72 hours) to oral **Phenoxymethylpenicillin** 500 mg every 6 hours *or* **Amoxycillin 500mg** 8 hourly

- Continue for a total of 14 days antibiotic treatment

Alternatively if penicillin hypersensitivity:

- **Erythromycin** 500mg every 6 hours

Children

- **Benzylpenicillin** 25,00 units/kg/dose
- Switch when possible (usually after 48-72 hours) to oral **Amoxycillin** 15mg/kg every 8 hours.
- Continue for a total of 14 days antibiotic treatment

Alternatively if penicillin hypersensitivity:

- **Erythromycin** 12.5 mg/kg/dose
- Give analgesic/antipyretic for pain and fever (see *Section 10.1 page 91*)
- If pus is present and does not drain spontaneously then carry out incision and drainage
- If quinsy is present carry out needle aspiration for analgesic and therapeutic effect b)

b) Retropharyngeal abscess

- Surgical drainage is usually necessary

Adults

- **Co-amoxiclav** 625mg every 8 hours (*or* Co-amoxiclav 375mg *plus* Amoxycillin 250mg) for 14 days

Alternatively

- **Chloramphenicol** 25 mg/kg every 8 hours, initially i/m or i/v later orally for a total of 14 days antibiotic
- Analgesic for pain and fever (*see Section 10.1 page 91)*

Children

- **Chloramphenicol** 25 mg/kg every 8 hours, initially i/m or i/v. later orally for a total of 14 days
- Analgesic/antipyretic for plan and fever (*see Section 10.1 page 91)*

16.1.6 Bronchitis (acute)

- Cough productive of purulent sputum, not improving after 3 days, without signs of pneumonia

Treatment

- **Amoxycillin** 500mg every 8 hours for 5 days *or*

- **Doxycycline** 200mg on first day followed by 100 mg daily for a further 5 days

16.1.7 Cervical adenitis

- Adenitis may be due to bacterial infection, TB, KS and/or HIV infection among other causes

Treatment

- **Amoxycillin** 500mg every 8 hours for 10 days

Alternatively if penicillin hypersensitivity:

- **Erythromycin** 500mg every 6 hours or
- **Doxycycline** 200mg on first day followed by 100 mg daily for a further 9 days
- For pain or fever give analgesic *see Section 10.1 page 91*
- If no improvement, do a fine needle aspiration for AFBs

16.2 Lower respiratory tract infections

16.2.1 Asthma (recurrent wheezing)

- Exclude stridor and upper airway obstruction (inspiratory difficulty rather than expiratory wheeze of asthma) before diagnosing and treating for asthma.
- Wheezing can also be a sign of heart failure
- **Prevention of attacks is important**
- Drugs delivered by metered dose inhaler (MDI) should *always* be given via a **spacer device**, especially during acute attacks. This will maximize effective drug delivery and minimize side effects.
- You can make an effective spacer device using a plastic bottle. Cut a small hole in the bottom of a plastic bottle that you can fit the inhaler mouthpiece to with an airtight seal. Shake the inhaler before each puff
- Prime the spacer device with 2 puffs before use
- If a spacer is unavailable, check patient inhaler technique to ensure good delivery of the drug into the lungs, not the throat.
- Antibiotics are not routinely indicated in asthma. They are indicated if there is good evidence of a precipitating respiratory infection (e.g. fever, bronchial breathing)

16.2.2 Severe asthma

- Consider other causes of acute severe breathlessness with careful examination: acute left ventricular failure, pneumothorax, pulmonary embolus, upper airway obstruction, massive pleural effusion, severe pneumonia.
- Severe or life threatening asthma in adults is suggested by any of the following:
    - Silent chest
    - Central cyanosis
    - Tachypnoea RR >30, exhaustion, inability to complete sentences
    - Persistent tachycardia >110bpm, bradycardia, hypotension, pulsus paradoxus
    - Use of accessory muscles
    - Confusion, agitation or coma
    - Peak flow < 33% of predicted
- **Arrange immediate hospitalization**

Treatment

- Set up i/v line and rehydrate with **0.9% normal saline**
- High flow oxygen 5l/min
- **Salbutamol nebuliser solution** 5 mg by nebuliser repeated initially as required, then every 6 hours *or* **Salbutamol** 4 puffs inhaled via spacer device and
- **Hydrocortisone** 200 mg i/v every 8 hours for 3 – 5 days then
    - Change to **prednisolone** 40mg orally as a single daily dose in the morning, with food for another 5 - 7days
    - If you need to use steroids for more than 10 days, gradually taper the dose for steroids 10mg per week initially, and decrease by 5mg until you stop.
- Give an appropriate antibiotic therapy:

  Amoxycillin 500mg every 8 hours for 5 days *or* Doxycycline 200 mg on first day followed by 100 mg daily for a further 4 days
- Repeat Salbutamol dose via spacer or nebuliser every 15 -30 minutes until improved or reassess after 1hour

  *If no improvement add o*nly if not already taking **t**heophylline
- **Aminophylline** 250mg slowly over 10 minutes. Beware of acute aminophylline toxicity including cardiac arrhythmias and seizures.

  If no response:

- Give **Aminophylline** 250 - 500mg an i/v infusion in 1L of 5% dextrose or 0.9% sodium chloride over 12 hours
- **Magnesium sulphate** 1.2 – 2.0g i/v over 20 minutes
- **Adrenaline** 0.5-1.0ml of 1:1000 slowly nebulised or i/m
- You may need to rescue the exhausted patient with assisted ventilation
- Reassess continuously until the patient settles

16.2.3 Milder asthma attacks

- Carefully teach and monitor correct inhaler use technique and recommend a spacer device

Adults:

- **Salbutamol** inhaler 2 puffs via a spacer device repeated as required initially, then every 8 hours
- Keep under observation at least for 24 hours after attack

Alternatively:

- **Salbutamol** 2 - 4mg orally every 8 hours
- Antibiotic therapy may be indicated if signs of infection

16.2.4 Maintenance and preventive treatment of asthma - the stepwise approach

- An environment free from cigarette and wood smoke can reduce attacks
- Check compliance and inhaler technique at each step before progressing
- Step up where required due to frequency of exacerbations
- Step down where possible:

  - ***STEP 1****:* Initial treatment should be with **Salbutamol** inhaled via a spacer device (see above) as required or tablets if inhalers are unavailable
  - ***STEP 2****:* If required more than once every day add preventive therapy -inhaled steroid eg **Beclamethasone** 2 puffs (200mcg) twice a day via a spacer. Increasing to 4 puffs twice a day as required
  - ***STEP 3:*** Refer for specialist care if no control with steps 1 & 2

Alternatively to be used only if the above are NOT available

- **Salbutamol tablets** 2-4 mg orally 3-4 times daily.
- **Aminophylline** 100mg twice daily.
- **Prednisolone** 5 mg orally once daily.

Note:

a. Use for the shortest time possible before reverting to preferred agents
b. Where asthma is mainly a problem at night, **Salbutamol** before bed may be sufficient
c. If asthma is brought on by exercise, adults can take 2puffs of salbutamol inhaler via a spacer device a few minutes before games or sports
d. Exercise induced asthma is usually a sign of poor control. If possible introduce an extra level of medication according to the stepwise approach above.
e. If asthma is brought on by exercise, older children and adults can take 2puffs of salbutamol inhaler via a spacer device 30-60 minutes before games or sports

16.3 Community Acquired Pneumonia (CAP)

- For all forms of pneumonia HIV testing is required.

16.3.1 Mild to moderate pneumonia

- Usually caused by pneumococcus (sudden onset)

Treatment

- **Amoxycillin** 500mg every 8 hours for 5-7 days

If Penicillin allergic

- **Erythromicin** 500mg orally every 8 hourly for 5-7 days
- **Doxycycline** 100mg bd for 5 – 7 days

If the patient does not improve, consider alternative diagnoses including

16.3.2 Atypical Pneumonia

- Caused by Mycoplasma pneumoniae and Chlamydia pneumoniae
- Suspect in previously healthy young adult not responding to treatment for CAP

Treatment

- Give **Erythromycin** 500mg orally every 6 hours for 5 days

16.3.3 Nosocomial pneumonias

- Caused by Staphylococcus aureus, gram negative rods and Pneumococcus

Treatment

- **Co-amoxiclav** 1.2g i/v every 8 hours or **Ceftriaxone** 2g i/v once daily

- Followed by oral **Co-amoxiclav** 625mg every 8 hours for 7 days

16.3.4 Severe pneumonia

- *Symptom and Signs:* Respiratory rate > 30/min, shock (- BP <90/60mmHg), confusion / drowsiness central cyanosis
- Refer to district hospital

Treatment

- **Benzyl penicillin** 2-3MU i/v every 6 hours plus **Chloramphenicol** 500mg i/v every 6 hours plus

Erythromycin 500mg every 6 hours or **Doxcycline** 100mg every twelve hours

- Switch to oral medication early

Alternatively

- **Co-amoxiclav** 1.2g i/v every 8 hours *plus*
- **Erythromycin** 500mg 6 hourly for a total of 7 days *or*
- **Doxycycline 100mg** every twelve hours for a total of 7 days antibiotic therapy

16.4 Suppurative Lung Disease

16.4.1 Lung abscess

- **Co-amoxiclav** 625mg every 8 hours plus
- **Metronidazole** 400 mg every 8 hours

Alternatively to Co-amoxiclav

- **Erythromycin** 500mg every 6 hours
- **Doxycycline** 100mg every twelve hours
- Continue treatment for 21 to 28 days

16.4.2 Empyema

- Carry out surgical drainage
- Continue antibiotic therapy as for CAP for 21 to 28 days
- Rule out TB

16.5 Bronchiectasis

Symptoms and signs: Chronic cough and sputum production years after treatment of pulmonary TB

- Physiotherapy to aid postural drainage of secretions every morning

- Give prompt antibiotic therapy when secondary infection occurs
- **Co-amoxiclav** 625mg every 8 hours

Alternatively

- **Doxycycline** 200mg stat then **Doxycycline** 100mg once daily
- If sputum is foul smelling, add **Metronidazole** 400mg every 8 hours
- Treat for 14 days

16.6 Chronic Lung disease / COPD

- Acute exacerbations may present in a similar way to asthma, however the patients will be older, and will often have smoked or been exposed to wood smoke, e.g. cooking at home.
- Not always related to an infection.

Treatment

- **Salbutamol** as required.
- Always use a spacer device as described in the section on asthma above.
- **Prednisolone** 40mg po once daily for 10 days

If there is fever and purulent sputum then

- **Amoxycillin** 500mg every 8 hours for 7 days
- If a patient has more than 4 exacerbations in a year a trial of regular inhaled Salbutamol via a spacer 2 puffs four times daily, and as required in between can be tried.
- Long term use of oral steroids is **NOT** recommended.

16.7 Pulmonary Embolism

- Treat with 6 months **Warfarin** therapy if available, but **only** if INR monitoring **and** specialist supervision are available.
- Long term treatment may be necessary in certain circumstances, including recurrent cases.
- Look for a triggering cause.

17.0 Sexually Transmitted Infections (STIs)

- Refer to the **Management of Sexually Transmitted Infections Using Syndromic Management Approach, Guidelines for Service Providers, MoH, *3rd edition May 2008*** for more detailed information.
- All patients who present with STI symptoms should be offered HIV Testing and Counselling.

Prompt and effective treatment of STIs helps prevent spread of HIV infection

General Management

- Ensure adequate privacy in patient management.
- Establish a correct diagnosis whenever possible.
- Make efforts to trace, treat and counsel all sexual contacts.
- Provide health education and counseling on each return visit.
- Advice on 'safer sex' practices to prevent re-infection, i.e. abstinence, correct use and storage of condoms, mutual faithfulness of uninfected partners, decrease in number of sexual partners, use of non-penetrative sexual techniques and the importance of partner notification and treatment.
- Offer a supply of condoms at each patient visit

Periodically check the patient's understanding of the above issues by asking him/her to repeat the information given

17.1 Syndromic management of STIs

- The syndromic approach is based on the fact that most common causes of an STI infection generally present with certain groups of signs and symptoms (syndrome) and treatment given is supposed to target the commonest possible causes of that syndrome.
- Common STI syndromes:
    - Genital ulcer disease (GUD) *Section 17.1.1 page 144*
    - Urethral discharge *Section 17.1.2 page 145*
    - Genito-urinary symptoms in women *Section 17.1.3 page 145*
    - Lower abdominal pain (women) *Section 17.1.4 page 146*
    - Acute scrotal swelling *Section 17.1.5 page 149*
    - Enlarged inguinal lymph nodes (bubo) *Section 17.1.6 page 149*
    - Balanitis/balanopostitis *Section 17.1.7 page 150*

17.1.1 Genital ulcer disease (GUD)

Common Causes: genital herpes, chancroid and syphilis may be present concurrently.

- Genital herpes is the most prevalent amongst the three.
- Treat patients with GUD for the above three infections

General Management

- Aspirate fluctuant lymph nodes (buboes) through adjacement normal (i.e. not inflamed) skin.
- Do not incise.
- Ask patients to return if non-fluctuant nodes become fluctuant

Treatment

- **Ciprofloxacin** 500mg orally stat and
- **Benzathine penicillin** 2.4 MU i/m stat
- **Acyclovir 800mg** every 12 hours orally for 7 days
- Tell patient to return for follow-up care in 7-10 days, s*ee below*

  Note: Acyclovir is indicated only in symptomatic GUD clients

If patient allergic to penicillin:

  - **Erythromycin** 500mg every 6 hours for 15 days plus
  - **Acyclovir** 800mg orally every 12 hours for 7 days

If patient allergic to penicillin/Ciprofloxacin and pregnant or lactating:

  - **Erythromycin** 500mg every 6 hours for 15 days and acyclovir 800mg every 12 hours for 7 days

- Infants born to mothers treated for GUD with Erythromycin alone:
  - **Benzathine Penicillin** 500,000 IU/kg as a single dose

Follow-up care of GUD

- Inform the patient to return 7-10 days after starting treatment.
- *If the ulcers have not healed or are getting worse*, repeat GUD treatment if there is evidence of noncompliance.
- If the client complied fully and there is no improvement:
  - Give **Azithromycin** 2g stat.
  - Review in further 7-10 days
  - If no improvement, *refer for specialist opinion*
  - If improved, *follow patient's progress until completely healed*
  - No further antibiotics are required at this time
- *If the ulcers have improved but not completely healed:*
  - Repeat chancroid treatment **Ciprofloxacin** 500mg single dose
  - Review in further 7-10 days

- Subsequent action as above

- *If the ulcers have completely healed:*
  - Reinforce counseling and patient education
  - Promote/provide condoms

17.1.2 Urethral Discharge/Urethritis in Men (UD)

Symptoms/Signs: discharge or dysuria

- *Common causes:* Neisseria gonorrhoea, Chlamydia trachomatis and trichomonas vaginalis.
- Common in males

Note: If there is dysuria but no discharge and no sexual contact in the last 2 weeks, seek other causes, like urinary tract infection, prostates or schistosomiasis

Treatment

- **Gentamycin** 240mg i/m stat plus
- **Doxycycline** 100mg every 12 hours with food for 7 days
- **Metronidazole** 2g stat

Alternative to Doxycline in pregnancy/lactation:

- **Erythromycin** 500mg every 6 hours for 7 days
- Review after 7 days
- *If symptoms persist or recur*:
  - Rule out re-infection
  - Assess compliance
  - Retreat as above if noncompliant or there is evidence of reinfection
  - Review after further 7 days
- *If symptoms still persist, refer* for further investigation

17.1.3 Abnormal Vaginal Discharge in Women (AVD)

Causes: vaginal infection, cervical infection, endometrial infection/pelvic inflammatory disease (PID)

- *Common causes of vaginal infections*: trichomonas vaginalis, candida albicans and bacterial vaginosis.
- *Common Causes of cervical infections*: neisseria gonorrhoeae and chlamydia trachomatis.

Note: Vaginal discharge is normal during and after sexual activity; at various points through-out the menstrual period; and during pregnancy and lactation.

General Management

- Do risk assessment to identify women at risk of cervical infection
    - treat for vaginitis to those with negative risk assessment
    - treat for cervicitis and vaginal infection to those with positive risk assessment.
- Treat all women with vaginal discharge and a positive risk assessment for *gonococcus* and *Chlamydia infection*, plus *trichomoniasis* and *bacterial vaginosis* t should be.
    - If the discharge is white and curd-like also treat for *candidiasis*.
- Treat all women with vaginal discharge and a negative risk assessment for *trichomoniasis* and *bacterial vaginosis*
    - If the discharge is white and curd-like, also treat for *candidiasis*.

Treatment

- *If vaginal discharge is present and the risk assessment is positive:*
    - **Gentamycin** 240mg i/m stat plus
    - **Doxycycline** 100mg orally every 12 hours for 7 days, *plus*
    - **Metronidazole** 2g orally single dose
- *If the discharge is white or curd-like* add 1 **Clotrimazole Pessary** 500mg inserted intra-vaginally stat
- *If vaginal discharge is present and risk assessment is negative:*
    - **Metronidazole** 2g orally single dose stat
- *If the discharge is white or curd-like* add **1 Clotrimazole Pessary** 500mg inserted intra-vaginally STAT
- *If no discharge is found and risk assessment is positive:*
    - **Gentamycin** 240mg i/m stat plus
    - **Doxycycline** 100mg orally every 12 hours for 7 days
- *If no discharge is found and risk assessment is negative:*
    - Reassure client, counsel, educate and provide condoms.
    - Advise client to come back if symptoms persist.
    - Offer HIV testing after providing information and counselling

Examination of GUS in women should *never* be omitted only for convenience of the health worker

17.1.4 Lower abdominal pain in women (LAP Syndrome)

- A serious condition which should be considered in every woman with lower abdominal pain.

  Note: Not every woman with lower abdominal pain has PID.

Be sure to include any conditions which require immediate surgical or gynaecological treatment

- *Symptoms/Signs*: fever, lower abdominal pain, pain on discharge, vaginal discharge, cervical tenderness, and often adnexal tenderness or masses on bimanual examination.
- *Symptoms/Signs of acute illness requiring immediate gynaelogical/surgical attention*: Missed or overdue or delayed period; recent abortion, delivery or miscarriage; metrorrhagia; abdominal guarding or rebound tenderness; Active vaginal bleeding.

General Management

- *If the patient has a missed/overdue period or abnormal vaginal bleeding:*
  - Consider referral *see Section 17.1.4.1 page 148* for in-patient treatment
  - When referring, ensure patient's general condition is stable
- *If the patient is very ill, bleeding heavily or in stock*:
  - Set up an iv drip and commence resuscitation measures
- *If the patient does not have missed/overdue period or abnormal vaginal bleeding but does have any of the following:*
  - Recent delivery; Recent/suspected abortion; Rebound tenderness; Abdominal guarding
  - Give first dose of treatment for PID.
  - Refer immediately for hospital admission after resuscitating the patient should this be required.
  - See *Section 17.1.4.1 page 148* for in-patient treatment
- *Admit if the patient:* is obviously sick; is pregnant; vomits oral medication or if adequate follow-up care cannot be provided.

Treatment

- If the patient does not have missed/overdue period or abnormal vaginal bleeding, does not have any of the signs/symptoms listed in b) but does have cervical excitation tenderness or fever*:*
  - **Gentamycin** 240mg i/m stat,
  - **Doxcycline** 100mg 12 hourly and
  - **Metronidazole** 400mg 12 hourly for 10 days.
  - Remove any IUCD if any and offer other means of contraception
  - Treat partner for gonococcal and chlamydial infection
  - Review patient after 72 hours:
- *If improved*, complete 10-day course of treatment for PID
- *If not improved*, refer for gynaecological or surgical consultation

- *See Section 17.1.4.1 below* for in-patient treatment

- *If the patient does not have missed/overdue period or abnormal vaginal bleeding, does not have any of the signs/symptoms listed in b), and not have cervical excitation tenderness or fever:*
  - Determine whether the patient has any other genitourinary complaint/syndrome and manage as per appropriate syndrome:
  - Ask her to return if the abdominal pain persists

17.1.4.1 Lower Abdominal Pain in Women (PID): In-patient treatment

- *Signs or symptoms of acute PID requiring admission:* Failure to respond to syndromic treatment regime *Section 17.4.1 page 153* within 72 hours; Presence of tender pelvic mass which may be an abscess or an ectopic pregnancy; History or suspicion of recent induced abortion, delivery or miscarriage; Active vaginal bleeding; Missed, overdue or delayed period; regnancy; Metrorrhagia; Vomiting of oral medication.

The patient should be admitted if follow-up care cannot be guaranteed

Treatment

If toxic:

- i/v fluids and parenteral antibiotics.
- **Gentamycin** 1.5 mg/kg slow i/v or i/m every 8 hours plus
- **Chloramphenicol** 500mg i/v every 6 hours
- **Metronidazole** 500mg i/v every 8 hours

When improved and able to swallow:

- add **Doxycycline** 100mg every 12 hours and
- switch from parenteral to oral **Metronidazole** 400mg every 12 hours for 10 days

For pain and fever

- Analgesic (*see Section 24.1 page 196*)

If pain is severe:

- **Pethidine** 100 mg i/m or orally
- Repeat every 3-6 hours, as required

  Note: Acute PID may be due to puerperal or post-abortion sepsis. Admit treat with parenteral antibiotic therapy.
- ***Evacuate the uterus*** within 12 hours of antibiotic therapy regardless of the patient's temperature

- Provide supportive care such as blood transfusion, iv fluids and

- Closely monitor vital signs.

17.1.5 Acute scrotal swelling or pain

General Management

- Distinguish from scroll swelling/pain due to:
  - *Other long-standing causes*, e.g. Scroll hydrocele, varicocele, inguinal hernia
  - *Recent/acute illness,* e.g. Testicular torsion or trauma, inguinal hernia

Thorough history and physical examination are necessary to exclude potentially life-threatening conditions and to determine whether immediate surgical attention is required

Treatment

- *Even if the presumptive diagnosis is an STI,* treat all patients and partners for gonorrhoea and chlamydia infection:
- **Gentamycin** 240mg i/m stat and
- **Doxcycline** 100mg every 12 hours for 7 days.
- In preganant or lactating mothers **Doxcycline** should be replaced with **Erythromycin** 500mg every 6 hours for 7days.
- Additional therapy for the patient:
  - bed rest with the scrotum elevated
  - cold compresses to help reduce swelling
- *If there is no evidence of painful and/or swollen scrotum*, look for signs of another STI and if present treat appropriately

17.1.6 Enlarged inguinal nodes (bubo)

- Both chancroid and lymphogranuloma venereum (LGV) can cause bubo.
- *Exclude the following conditions which may also cause enlarged inguinal lymph nodes*: septic skin lesions on thigh, foot, leg, toes, buttock, anus, perineum, scrotum, penis, labia, vulva and vagina, systemic infections e.g. Hepatitis B. HIV infectious, mononucleosis, syphilis, TB, other infections e.g. bubonic plague, cat scratch fever, trypanosomiasis, lymphoma, leukemia, Kaposi's sarcoma.
- *Exclude other conditions which may cause groin swelling unrelated to enlarged lymph nodes including*: inguinal hernia, lipoma, a boil in overlying skin.
- Confirm presence of bubo by careful examination

All patients with bubo should be carefully examined for signs of other STIs

Treatment

- *If bubo present and genital ulcer present,* treat as for genital ulcer disease syndrome
- *If bubo present, and painful, fluctuant or recent onset (under 2 weeks) and no genital ulcer present:* treat patient and partner for LGV
- **Doxycycline** 100mg every 12 hours with food for 14 days

Alternatively in pregnancy/lactation

- **Erythromycin** 500mg every 6 hours for 14 days
- If bubo fluctuant, aspirate through adjacent normal skin (do not incise)
- *If enlarged inguinal lymph node present, but not painful, fluctuant or of recent onset (under 2 weeks) and no genital ulcer present:* look for other causes of inguinal swelling:
    - e.g. generalized lymphadenopathy (rule out secondary syphills and HIV), hernia, tumour.
- Refer for biopsy if indicated
- *If bubo not present but other signs of STI found,* treat accordingly
- *If bubo not present and other signs of STI not found*, reassure, educate/counsel the patient
- Promote/provide condoms

17.1.7 Balanitis/balanopostitis (BA Syndrome)

- *Cause:* fungal infection, trichomonal infection and medicine reactions
- Common and persistent in persons with *diabetes* and with *immunosuppression* caused by HIV infection

The most common reason for balanitis is poor genital hygiene

General Management

- Ask patient about any recent topical application of medicines (including traditional medicines)
- Ask patient if partner/s have vaginal itching or discharge – this may indicate *candidiasis* or *trichomoniasis*
- Examine the patient carefully for presence of genital ulcers and urethral discharge

Treatment

- *If the foreskin is retractable and ulcer/s present, or if the foreskin is not retractable:*
    - Treat as for genital ulcer Disease syndrome.
- *If the foreskin is retractable, no ulcer, but urethral discharge present:*
    - Treat as for urethral discharge

- *If the foreskin is retractable, no ulcer, no urethral discharge, but erythema or erosions present:*
  - Treat for candida infection
    - Apply **Gentian Violet 1% aqueous solution** to glans penis daily for 7 days.
  - Treat partners with **Clotrimazole pessary** 500mg inserted vaginally once.
  - Advise on genital hygiene, including frequent washing of penis with soap and water
  - Review patient in 7-10 days:
- *If symptoms persist:*
  - Treat patient and partner for trichomoniasis with **Metronidazole** 2g stat.
  - Advise client to avoid alcohol during treatment and for 48 hours after dose
- *If symptoms resolved and no signs of STI*:
  - Reassure, educate/counsel
  - Promote/provide condoms
- *If foreskin is retractable, no ulcer, no urethral discharge, no erythema or erosions and no signs of STI:*
  - Reassure, educate/counsel
  - Promote/provide condoms

17.2 Genital warts

- Distinguished from *condyloma* of secondary syphills, and *molluscum contagioum*
- Besides local caustic applications, surgical removal or electrocautery may be used for treatment:
  - For more extensive growth
  - When topical applications have failed
  - When topical application are contra-indicated

Treatment

- Apply **Compound Podophyllin Paint** to the lesions at weekly intervals
- Apply **Yellow Soft Paraffin** to avoid normal tissue
- Use only for scattered growth
- When applied to vulval mucosa or to meatal warts, allow to dry before coming back into contact with normal epithelium
- Remove the paint by washing off after 1-4 hours

Note: Do not use this therapy during pregnancy

- If no effect after 4-6 weeks, stop treatment and consider alternative methods of removal

Alternatively to Podophyllin Paint, and for treating vulvar warts:

- Apply **Silver Nitrate Stick (pencil)** once daily

17.3 Neonatal Conjuctivitis

- These serious conditions rapidly progress and threaten sight
- Admit patient to hospital
- Closely monitor until the infection has resolved
- Give antimicrobial therapy without delay
- Irrigate the eyes frequently with normal saline

At birth give all neonates a single prophylactic application of tetracycline eye ointment

Treatment

Adults and all parents of infected babies:

- **Gentamycin** 240 mg i/m single dose

Infants with signs of conjunctivitis:

- Isolate immediately
- Institute a rigorous system of barrier nursing with careful attention to hygiene
- **Gentamycin** 5mg/kg i/m once (7.5mg /kg if the infant is older than 7 days) and
- **Erythromycin** 12.5mg/kg orally every 6 hours for 14 days.

Alternatively for Gentamycin,

- **Cefotaxime** 50mg/kg i/m as a single dose (maximum 125mg)
- **Tetracycline eye ointment 1%** applied in each eye every 6 hours for 3 days
    - Clean away any discharge before application
- Wash eyes with clean water/saline ideally every 2 hours until the purulent discharge is cleared
- *Treat Father with*
    - **Gentamycin** 240mg i/m stat, and
    - **Doxycycline** 100mg every 12 hours for 7 days
- *Treat Mother with:*
    - **Gentamycin** 240mg i/m stat, and
    - **Erythromycin** 500mg every 6 hours for 7 days

Alternative topical agent:

- **Gentamycin eye drops 0.3%**, 1.2 drops into each eye every 2 hours

- Reduce dose frequency as the infection is controlled
- Continue for 48 hours after healing

17.4 Syphillis

- Use this regime for patients with syphilis confirmed by laboratory testing
- In treatment of secondary syphilis, a Herxheimer reaction (malaise, fever, headache, rigors) may sometimes occur within 6-12 hours of initial treatment

Treatment

- Treat this with **Aspirin** 600mg every 6 hours

17.4.1 All syphilis except neurosyphilis

- Includes:
  - *Early syphilis*: primary (ulcer), secondary (generalized skin rashes, condylomata lata) or latent syphilis of not more than 2 years duration
  - *late syphilis*: benign, cardiovascular and latent syphilis of more than 2 years; syphilis of indeterminate duration
  - congenital syphilis in children
- Treat as late syphilis all patients with a positive RPR or VDRL and no documented syphilis serology in the last 2 years.

17.4.1.1 Early syphilis in adults

Treatment

- **Benzathine Penicillin** one dose of 2.4 MU i/m
  - Divide as 1.2 MU into each buttock

Alternatively, if hypersensitivity to penicillin:

- **Doxycycline** 100mg every 12 hours for 15 days

Note: In pregnancy/lactation, substitute Doxycycline with Erythromycin 500mg every 6 hours for 15 days

17.4.1.2 Late syphilis in adults

Treatment

- **Benzathine Penicillin** 3 doses of 2.4 MU i/m at weekly intervals
  - Divide each weekly dose 1.2 MU into each buttock: total (3 doses) is 7.2 MU

Alternatively, if hypersensitivity to penicillin:

- **Doxycline** 100mg orally every 12 hours for 30 days
- **Note:** In pregnancy/lactation, substitute Doxycycline with Erythromycin 500 mg every 6 hours for 30 days

Notes for pregnant patients

- Any history of penicillin hypersensitivity must be reliable as these patients are put at serious disadvantage because they cannot be given tetracyclines
- The child must be treated for congenital syphilis at birth as Erythromycin does not readily cross the placenta

17.4.2 Congenital syphilis in children

- Treat with a single dose of **Benzathine penicillin** 50 000 IU/kg i/m in all infants born to sero-positive mothers whether or not the mothers were treated during pregnancy (with or without penicillin) unless they have features of congenital syphilis.
- Thoroughly examine for congenital syphilis all infants born to women with reactive serologic tests: look for ascites, oedema, jaundice, hepatosplenomegaly, rhinitis, nasal discharge, hoarse cry, skin rash, and/or pseudoparalysis of any extremity.
- Treat infants with these symptoms as early congenital syphilis:

Treatment

- **Benzylpenicillin** 50 000 IU/kg**/**dose i/v every 12 hours, during the first 7 days of life and every 8 hours thereafter for a total of 10 days,
- *Children with late congenital syphilis (more than 2 years) are treated as follows:*
    - **Benzylpenicillin** 50 000 IU/kg/dose i/v every 4 to 6 hours 10 to 14 days,

Alternatively, in penicillin allergic children

- Give **Erythromycin syrup** 12.5mg 6 hourly for 30 days.

- The risk of penicillin hypersensitivity in the 1st month of life can be safely discounted

17.4.3 Neurosyphilis

- Higher penicillin doses are necessary to ensure that levels in the CSF do not fall below required amount throughout the course of treatment

Treatment

Adults:

- **Benzylpenicillin** 4MU i/v every 6 hours for 14 days then
- **Benzathine Penicillin** 2.4 MU i/m once weekly for 3 consecutive weeks

Alternativly e if confirmed hypersensitivity to penicillin:

- **Doxycycline** 200mg every 12 hours for 30 days

Note: In pregnancy: substitute Doxycycline with Erythromycin 500mg every 6 hours for 30 days

17.5 Trichomoniasis, vaginal

- Coincident bacterial vaginosis reduces the effectiveness of single dose Metronidazole treatment
- Asymptomatic male partners should also be treated

Treatment

- *Adults:*
  - See AVD Syndrome (*Section 17.1.3 page 145*)
- *Infants with symptomatic trichomoniasis or urogenital colonization persisting after the 4th month*
  - **Metronidazole 5 mg/kg** every 8 hours for 5 days

17.6 Management of Children and Adolescents Victims of Sexual Assault and Rape

1	• Assess and treat serious injuries first • Obtain verbal consent to conduct physical examination • Take full history and document all findings (use appendix 2 – "examination record" as recording framework) • Conduct full physical examination and document all findings • Document all facts regarding the assault
2	Manage physical effects of the assault such as wounds and bruises – including antibiotics to prevent wound infection, tetanus booster if required, medication for pain relief or anxiety
3	Provide emergency contraception if the victim has started menarche and presents within 72 hours post-assault • **Postinor-2** – take 1 tablet orally, to be repeated after 12 hours *or* • **Lo-Femenal** 4 tabs to be repeated after 12 hours
4	Treat presumptively for STIs (or conduct laboratory investigations if available): • **Benzathine Penicillin** < 25 kg: 600,000 IU stat. > 25 kg 1,200,000 IU stat • **Gentamycin 6mg/kg** single dose • **Erythromycin 12.5mg/kg** every 6 hours for 7 days • **Metronidazole 5mg/kg** every 8 hours for 7 days
5	• Provide HIV Testing and Counselling • Conduct an HB baseline reading (if available)

<table>
<tr><td></td><td>

If the victim presents within 72 hours of penetrative assault, and is HIV negative upon initial testing, and consents to PEP treatment -
Provide HIV PEP
If the victim has HB ≤ 8 g/dl Duovir must be replaced with LamivirS

<table>
<tr><th colspan="2">Duovir - BD * 30 days OR ELSE
Lamivir S - BD * 30 days</th></tr>
<tr><td>< 14 kg - ¼ tablet</td><td>25-35 kg – ¾ tablet</td></tr>
<tr><td>15- 24 kg – ½ tablet</td><td>> 35 kg – 1 tablet</td></tr>
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Provide counselling on post-traumatic stress to victim and guardian
Assess safety of the victim
Refer to other support services, such as the Victim Support Unit in the Police

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<tr><td>7</td><td>

Advise on dates for follow up visits
Record Findings and treatment in “Examination Record” and provide copy to the victim for submission to the police, if appropriate

Record all findings and treatment in health passport
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18.0 Skin conditions

18.1 Bacterial skin infections

18.1.1 Impetigo, Folliculitis, Furunculosis and Carbuncles

- *Causes*: Staphylococcal aureus and Streptococcal pyogenes.

General management

- Keep infected areas clean- wash daily with soap and water
- For children, instruct the mother
- Prevent spread to others – take care with towels and clothes and change/clean bedding frequently
- Remove crusts with warm water

Treatment

- Apply **Gentian Violet** paint 0.5 % on wet lesions

Alternatively

Adults

- **5% Salicylic acid with 5% Sulphur**

Children

- **2% Salicylic acid with 5% Sulphur ointment**
- If extensive or involving hairy areas: **Flucloxacillin** 125-500mg every 6 hours for 5-7 days *or*
- **Erythromycin** 125-500mg every 8 hours for 5-7 days.

If no response, refer to hospital

- For furunculosis and carbuncle – clean the affected area with water and soap.
- Do incision and drainage if fluctuant
- Give systemic antibiotics as above.

18.1.2 Ecthyma

- An ulcerative streptococcal pyogenes skin infection which can easily be confused with impetigo.
- Only recognized upon removal of a scab where a punched out ulcer may be seen.

General Management

- Remove crusts
- Give systemic antibiotics for 14 – 28 days

18.1.3 Neonatal Pustulosis/ Bullae

- *Causes*: Staphylococcal aureus or Streptococcal pyogenes, syphilis (Treponema pallidum)

Treatment:

- **Potassium permanganate** baths
- **Benzylpenicillin** 50,000 units/kg i/m or i/v every 12 hours for 5 days *plus*
- **Gentamycin** 2.5mg/kg i/m or i/v every 12 hours for 5 days
- Check the mother's VDRL or TPHA – if positive treat *see Section 17.4 page 153*

18.1.4 Erysipelas

- Well demarcated, erythematous superficial skin lesion with some blisters.
- Commonly caused by a beta- haemolytic group-A streptococci.

Treatment

- **Benzyl Penicillin** 2MU i/m every 6 hours
    - When temperature drops or when condition improves change to **Erythromycin** 500mg every 6 hours for 5-7days.
- Apply **GV paint** every twelve hours

18.1.5 Cellulitis

- Poorly defined erythematous lesion.
- This is bacterial infection of the deeper part of the dermis and the upper part of the subcutaneous tissue

Treatment

- **Flucloxacillin** 125 -500mg every 6 hours for 7 – 10 days

If penicillin hypersensitive give

- **Erythromycin** 500mg every 6 hours for 7 -10 days

If the patient is systemically unwell, then give

- **Benzyl Penicillin** 2 MU i/m every 6 hours for 7 – 10 days or oral antibiotics
- Elevate the leg(s) on a pillow to reduce swelling.

18.1.6 Staphylococcal Scalding Skin Syndrome – Lyell's disease

- A febrile, rapidly evolving generalized and blistering desquamative skin condition in which the skin exfoliates in sheets.
- Commonly affects neonates and young children, rare in adults unless one is immune compromised

General Supportive Measures

- Replace fluid
- **Flucloxacillin** *or* **Cloxacillin** 250 – 500 mg every 6 hours for 7days.
- Cortico-steroids are contra indicated

18.2 Erythema Multiforme/Steven Johnson's Syndrome

18.2.1 Erythema multiforme – Minor (Iris Type)

- Prodromal symptoms are generally absent and there is relative sparing of the mucus membrane and the trunk
- Target lesions (Iris) are characterized by dark centre and inner pale ring and an erythematus type outer border.

Treatment (Symptomatic)

- **Potassium Permanganate** baths twice a day
- **Calamine lotion** if vesicular origin or popular eruptions
- Identify the cause and treat. If the cause is medicine, stop the medicine
- **Chlorpheniramine 4mg** 8 hourly for 7 days

18.2.2 Steven Johnson's Syndrome/Vesicobullous type

- Potentially fatal condition
- Often caused by hypersensitivity to medication.
- Always ask for use of antiretroviral therapy (nevirapine), sulfa drugs, and penicillines. These need to be stopped immediately

Treatment (Symptomatic)

- **Normal Saline** a must – put up i/v line.
- Add **Dextrose**
- Identify the cause and treat. If the cause is medicine, stop the medicine
- **Prednisolone** 60 – 80mg once daily for 7days; 40mg once daily for 3days; 30mg once daily for 3 days; 20mg once daily for 3 days; 10mg once daily for 3 days; 5mg once daily for 3 days
- Keep patient warm
- **Potassium Permanganate** baths twice daily
- **GV Paint** on fresh lesions
- **Acyclovir** course if of viral origin
- Give **Ceftriaxone** 2g i/v once daily

18.3 Toxic Epidermal Necrolysis (TEN)

- Management is like in Steven Johnson's Syndrome.
- Often caused by hypersensitivity to medication. Always ask for use of antiretroviral therapy (nevirapine), sulfa drugs, and penicillines. These need to be stopped.
- Refer to the hospital

Treatment

- **Prednisolone** 80mg once daily for 1 week; 70mg once daily for 3 days; 60mg once daily for 3 days; 50mg once daily for 3 days; 40mg once daily for days; 30mg once daily for days; 20mg once daily for days; 10mg once daily for days; 5mg once daily for 3 days – Stop
- **Normal Saline** a must – put up i/v line.
- Identify the cause and treat.
- Give **Ceftriaxone** 2g i/v once daily
- High protein diet is recommended.

18.4 Fixed Medicine Eruption

- Diagnosis is clinical and in relation to history
- Stop the offending medicine
- Use potent topical steroids e.g. **Betamethasone cream** twice daily
- *If severe:*
    - **Chlorpheniramine** 4-8mg at bed time for 7 -14 days

18.5 Urticaria

- If deep dermis and subcutaneous tissues are involved it is called angioedema.

General Management

- Explain the condition to the patient
- Remove the cause if known

Treatment

- Give antihistamines –**Promethazine** 25mg i/m or orally at night or every 8 hours or at night for 1 to 2 weeks or till 48 to 72 hours after submission of the wheals

    Alternatively

    - **Chlorpheniramine** 4-8mg at night or every 8 hours for 1-2 weeks
- **Albendazole** 400mg stat
- **Calamine lotion** at night or twice daily

- **Adrenaline** 0.5ml sub-cutaneously in severe urticaria with tracheal angioedema

18.6 Eczema (dermatitis)

- An inflammatory itchy skin condition.
- *Types:* Atopic (*seborrhoeic (indogenous)*), Allergic (*irritant contact eczema (exogenous)*)

Treatment

- Determine the type of eczema
- Eczemas are often secondarily infected (impetigo), systemic antibiotic treatment should be added if indicated
- *In HIV (+) children, extensive seborrhoeic dermatitis may occur.*
    - **Potassium Permanganate** baths twice a day.
    - And topical steroidse.g. **Hydrocortisone 1%** cream or ointment *or* **Sulphur 5%with emulsifying ointment** twice a day.
    - If no response, give second line topical steroids or group 3 e.g. **Betamethasone creams**.
- *If secondary bacterial infection occurs:*
    - Treat with systemic antibiotics: **Flucloxacillin** or **Erythromycin**.

General Management

- Counsel the patient on the condition.
- Treatment depends on the texture of the affected skin.
- Remove any obvious precipitating factors (allergic or contact eczema) ask about soaps detergent, vaseline, cosmetics, clothings etc.
- Use antihistamine to relieve itching.

Treatment

Adults:

- **Promethazine** 25 mg orally at night.

Children:

- **Promethazine** 1 mg/kg.

Alternatively

- **Chlorpheniramine** 4-16mg at night for 2 weeks.
- Use antibiotics for secondary infection.
- Give systemic antibiotic treatment only if lesions are infected or signs of systemic infection are present

Note: First line treatment failures can do better with Betamethasone cream/ointment or Crude coal tar 5 % ointment.

18.6.1 Acute eczema

- Sudden eruption with erythema, vesicles and sometimes bullae, often with serous exudates (wet appearance)

Management

- Wet or oozing lesions - dry them first with **Calamine lotion** 2 times a day
- Give **Chlorpheniramine** 4mg at night for 7 days

18.6.2 Subacute eczema

- Lesions take several days to erupt, are red but not wet or may be slightly wet. Few vesicles.

Management

- Normal or slightly wet lesions- use **Hydrocortisone 1% cream** twice a day
- Give **Chlorpheniramine** 4mg at night for 7 days

18.6.3 Chronic eczema

- Develops after months/years, thickened dry and scaly skin, (lichenification), deep cracks (can bleed) scratch marks, sometimes infected

Management

- Dry skin lesions
    - **Hydrocortisone ointment** 2 times daily

    Alternative
    - Potent steroid e.g. **Betamethasone 0.1%**

18.7 Fungal skin infections

18.7.1 Tinea

- *Types***:** Capitis, corporis, pedis ,cruris, unguium.
- Instruct patients on the importance of treatment compliance in order to eradicate the infection

Treatment

- *For wet lesions*
    - Dry by soaking or mopping with **Potassium Permanganate**

    Alternatives
    - **Calamine Lotion** *or* **Gentian violet Paint**
    - Then, **Compound benzoic acid ointment** or **Clotrimazole cream**
- *In chronic or extensive cases and those involving hairy areas:*

- Add **Griseofulvin** 500mg orally daily with food, single dose or in 2 divided doses, 4-6 weeks
- Children: 10mg/kg**/**dose

Notes:

- Tinea corporis, cruris, pedis treat for 4 weeks
- Tinea capitis treat for 6 weeks
- Tinea unguium of the fingernails treat for 12 months
- Tinea unguium of the toe nails treat for 2 years.

Alternative systemic antifungals

- **Ketoconazole** and **Fluconazole**.
- In HIV (+) patients all Tineas may be extensive.

18.8 Viral skin infections

18.8.1 Herpes simplex

- *Type*s: Type 1 (*affects lips*), Type 2 (*affects genitals but can interchange due to oral sex*)

Treatment

- In case of bacterial superinfection *see Section 18.1 page 157*
- Use salt mouth wash or **chlorhexidine solution**
- **Acyclovir Cream** *or* **GV Paint** *or* **Silver Sulphadiazine Cream Application** twice a day
- **Aspirin** 300mg or **Paracetamol** (*avoid Aspirin in children as it may cause Reye's syndrome*)
- In severe conditions give **Acyclovir** 200-400mg every 8 hours for 5 to 7 days and consider checking HIV.

18.8.2 Varicella (Chicken pox)

- *Refer to Section 9.8 page 75*

18.8.3 Herpes zoster (shingles))

- *Causes*: varicella zoster virus.
- A common presentation in HIV(+) patients

Treatment

- **Acyclovir** 800mg 5times a day for 5-7 days; best within 24 -72hours from onset of the lesions.

- **Calamine lotion** or **Acyclovir cream** bd on intact lesions till they break or
- **GV paint** , or **topical antibiotic** cream twice a day
- For pain relief refer to *Section 24.4 page 197*
- *For ophthalmic herpes zoster* treat as above and refer to eye department.
- Refer for HIV Testing

18.9 Prurigo/Pruritus

- *Symptoms/Signs:* itching.
- *Causes*: Iron deficiency, anaemia, lymphoma, leukaemia.

Treatment

- Adults and Children (symptomatic treatment):
- Apply **Calamine Lotion** 2-3 times daily
- **Promethazine** 25mg single dose at night *or*
- **Chlorpheniramine** 4-8mg at night for 2 weeks
    - Children: 1 mg/kg/ dose
- Emolients like **Emulsifying plain ointment** applications or baths b.d. may help reduce itching
- Investigate the cause, and treat accordingly

18.10 Scabies

- Secondary infection is common and may mask the condition.
- Treat the whole family and any other close contacts

Treatment

- Wash the whole body with mild soap and water, preferably at night, and dry up
- Apply **Benzyl Benzoate Application** 25% to the whole body from the neck down
- Ensure all parts of the skin are covered
- Allow the medication to dry and to remain on the skin for at least 10 hours or over night
- Next morning wash off the application with soap and water
- Wash all contaminated clothes, beddings and towels and use already washed clothes
- Repeat the above treatment on day 5

Alternative for benzyl benzoate application

- **Lindane 1% lotion**, single dose applied as above.

Note:

- Avoid Lindane in children less than 2 years old
- In children under 1year, also treat the face (except the area surrounding the eyes)
- For children under 5 years, Use 12.5% benzyl benzoate application
- Prepare this by diluting one part 25% benzyl benzoate application with an equal part of water

In cases of severe or extensive infection, especially with secondary bacterial infection:

- Give a systemic antibiotic *see Section 18.1 page 157*
    - **5% Salicylic acid and sulphur** ointment twice a day
    - Consider checking HIV.

If itching is problematic:

- Give reassurance
- Itching may persist for up to 2-3 weeks

If severe:

- **Chlorpheniramine** 4-8 mg at night for 2-3 weeks

18.11 Tropical ulcer

- Improve nutrition and diet

Treatment

- Clean ulcer with **Hydrogen peroxide solution (20 vol)**

Alternatively:

- **Cetrimide 15% +Chlorhexidine solution 1.5%** diluted 1 in 20 *or* **Potassium permanganate** soaks 1ml in 10,000mls of water
- Debride the wound if necrotic
- Daily **Potassium permanganate** soaks or cleaning
- Dress the wound with **Zinc paste with sulphur** regularly till healed
- Rest with leg elevated
- Do a skin graft if wound is clean and shows granulation

If local infection presents:

- **Phenoxymethylpenicillin** 500mg every 6 hours for 7 days *or*
- **Erythromycin 250mg** every 6 hours for 7 days
    - Children **12.5 mg/kg** body weight in 4 divided doses
- If possible, carry out culture and sensitivity testing to determine suitable antibiotic therapy
- Refer the patient to the hospital

18.12 Onchocerciasis

Refer to Section 15.2 page 127

18.13 Buruli Ulcer

- This is an ulcerative skin condition caused by Mycobacterium ulcerans

Treatment

- Depends on stage of condition, but if ulcerated
    - Daily wound dressing with saline
    - Medicine therapy is disappointing
    - Surgery

18.14 Leprosy

Refer to *Section 9.2 page 68*

19.0 Vaccinations

- For tetanus toxoid vaccination (TTV) *see Section 12.3 page 100*

Table 27: Vaccination schedule for children

At birth:	**BCG** 0.05 ml intradermally • Children > 1 year 0.1 ml **Polio 0**: 2 drops orally (= "zero dose")
6 weeks:	**PENTAVALENT** 1: 0.5 ml IM **Polio** 1: 2 drops orally
10 weeks:	**PENTAVALENT** 2 : 0.5 ml IM **Polio** 2 : 2 drops orally
14 weeks:	**PENTAVALENT** 3 : 0.5 ml IM **Polio** 3 : 2 drops orally
6 months:	Oral Vitamin A
9 months:	**MEASLES:** 0.5 ml deep S/C
12 months:	Oral Vitamin A

PENTAVALENT = **DPT**, **Hepatitis B** and **Heamophilus influenza** type B

Notes:

a) Aim to complete this schedule within the first year of life
b) **BCG vaccination**: give this as early as possible in life, preferably at birth – complications are uncommon. BCG is contraindicated in symptomatic HIV infection
c) **Measles vaccination**: normally give this when a full 9 months of age is reached.
d) Can give an extra dose which is recommended for groups at high risk of measles death, such as children in refugee camps, HIV- positive infants and during outbreaks of measles
e) **Pentavalent/polio :** the minimum interval between doses is 4 weeks
f) **Tetanus toxoid** vaccination: give a full course of this:
   - To all women *see Section 12.3 page 100*
   - After administration of anti-tetanus serum (ATS) to any previously unimmunised patient
   - If over 10 years has elapsed since the last booster dose

20.0 Bites, Burns and Wounds

20.1 Animal Bites

- Avoid suturing any kind of bite wound
- Thorough cleansing and debridement of the wound is essential
- The combination of local wound treatment, passive immunization with rabies immunoglobulin (RIG), and vaccination with anti-rabies vaccine is recommended for all severe exposures to rabies (see Table 28 page 169)
- Since prolonged rabies incubation periods are possible, persons who present for evaluation and treatment even months after having been bitten should be treated in the same way as if the contact occurred recently

> *Thorough prompt local treatment* of all bite wounds and scratches which may be contaminated with rabies virus is very important as elimination of the rabies virus at the site of infection by chemical and physical means is the most effective method of protection

- As part of local treatment in all cases of possible exposure, carefully instill rabies immunoglobulin RIG, if available, in the depth of the wound and infiltrate around the wound. See *Table 28 page 169* for dose information
- Avoid contact with the patient's saliva which is potentially infective. If possible, wear eye protection as patients may spit and infection through the conjunctiva can occur

Treatment

Adults and Children:

- Give **Tetanus Toxoid Vaccination** (TTV) *see Section 12.3 page 100*
- Flush and cleanse (scrub) the wound with **cetrimide 15% + chlorhexidine solution** 1.5% diluted 1 in 20 with water

Alternatively:

- Wash with **Hydrogen peroxide solution** (10 vol) or soap or detergent
- Rinse with normal saline and dress with a weak iodine solution or iodine cream
- Give **Anti-Rabies Vaccine**, only if necessary according to the recommendations in *Table 28 page 169***.**
- Give **Co-amoxiclav** 625mg every 8 hours plus
- **Metronidazole** 400mg every 8 hours
- If possible, capture and observe the animal for 10 days. If the animal is still alive after this time period, it does not have rabies

- Human bites should be managed as animal bites except for the use of anti rabies vaccine.

20.1.1 Post- exposure immunization

- Give anti-rabies vaccines to all patients unvaccinated against rabies, together with local wound treatment, and in severe cases, rabies immunoglobulin *(see Table 28 page 169)*

20.1.2 Administration of anti-rabies vaccine

- Use intra-dermal injection regimes for Anti RabiesVaccine whenever possible
- Give a 0.1 ml dose of **Anti Rabies vaccine** intradermally in either the forearm or upper arm, on days 0, 3 and 7
- Then give 0.1 ml of Anti Rabies vaccine at one site on days 30 and 90

Alternative intramuscular regime:

- Give one 1 ml dose of Anti Rabies vaccine i/m on days 0, 3, 7, 14 and 30

Suitable injection sites

- In adults: always inject the anti-rabies vaccine into the deltoid area of the arm
- In young children: the anterolateral area of the thigh may also be used. Never use the gluteal area for vaccination as it is then much less effective.

Table 28: Recommendations for Anti-Rabies Vaccination

NATURE OF EXPOSURE	**CONDITION OF ANIMAL**		**RECOMMENDED ACTION**
	At time of exposure	10 days later	
1. Saliva in contact with skin, but no skin lesion	Healthy	Healthy	Do not vaccinate
		Rabid	Do not vaccinate
	Suspect	Healthy	Do not vaccinate
		Rabid	Do not vaccinate
2. Saliva in contact with skin that has lesions, minor bites on trunk or proximal limbs	Healthy	Healthy	Do not vaccinate
		Rabid	Vaccinate
	Suspect	Healthy	Vaccinate, but stop course if animal healthy after 10 days
		Rabid	Vaccinate
		unknown	Vaccinate
3. Saliva in contact	Domestic or wild		Vaccinate, and give

with mucosae, serious bites (face, head, fingers, or multiple bites)	rabid animal or suspect		antirabies serum
	Healthy domestic animal Vaccinate, but stop course if animal healthy after 10 days		

20.1.3 Post-exposure immunization in previously vaccinated patients

- In persons known to have previously received full pre-or post-exposure treatment with rabies vaccine within the last 3 years:
- Give one booster dose of 0.1 ml **Anti Rabies Vaccine** intradermally on days 0 and 3

Alternative intramuscular regime:

- Give one booster dose of 1 ml **Anti Rabies Vaccine** i/m as above
- If completely vaccinated more than 3 years before or if incompletely vaccinated, give a complete post-exposure vaccination course

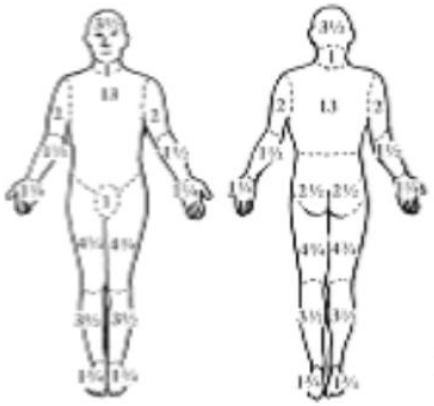
20.2 Burns

- Remember the ABCs of life support
- Assess the severity of the burn (see table below)
- Refer patients with burns of more than 15% (children: > 10%) of body surface area (BSA) to hospital on iv fluid therapy for resuscitation and burns dressing
- Refer all deep burns or burns of the face, neck or hands and perineum for further assessment
- Burns across joints should be immobilized and later encourage passive movement to prevent from contractures
- *If the burn is more than 40%, mortality is almost 100% therefore referral to a tertiary hospital may not be necessary*
- *Circumferential* burns of the limbs and trunk require immediate bed side escharotomy (see diagram of the site of incisions)

- Burns by nature are usually initially sterile. The aim of treatment is to speed healing while minimizing the risk of infection

- In the sick burned patient (fever+diarrhoea+/- a rash):
- Have a high index of suspicion of toxic shock syndrome
- Naso gastric tube insertion is helpful as gastric dilatation is common
- Give anti-acids to prevent gastric stress ulcers *(see Section 7.6 page 52)*
- Do a blood culture and malarial parasites
- Start intravenous flucloxacillin

20.2.1 Calculation of Body Surface Area Affected check with group that did this to get a better picture



Age: _____
Sex: _____
Weight: _____

Area	Birth–1 yr	1–4 yr	5–9 yr	10–14 yr	15 yr	Adult	Partial thickness 2°	Full thickness 3°	Total
Head	19	17	13	11	9	7			
Neck	2	2	2	2	2	2			
Anterior trunk	13	13	13	13	13	13			
Posterior trunk	13	13	13	13	13	13			
Right buttock	2½	2½	2½	2½	2½	2½			
Left buttock	2½	2½	2½	2½	2½	2½			
Genitalia	1	1	1	1	1	1			
Right upper arm	4	4	4	4	4	4			
Left upper arm	4	4	4	4	4	4			
Right lower arm	3	3	3	3	3	3			
Left lower arm	3	3	3	3	3	3			
Right hand	2½	2½	2½	2½	2½	2½			
Left hand	2½	2½	2½	2½	2½	2½			
Right thigh	5½	6½	8	8½	9	9½			
Left thigh	5½	6½	8	8½	9	9½			
Right leg	5	5	5½	6	6½	7			
Left leg	5	5	5½	6	6½	7			
Right foot	3½	3½	3½	3½	3½	3½			
Left foot	3½	3½	3½	3½	3½	3½			
						Total			

FIGURE 17.2. The Lund and Browder chart. This chart provides a more precise estimate of burn TBSA for each body part based on the individual's age.

Adults and Children:

- Give i/v fluid replacement according to the calculation below
- With mild burns (< 15% adults BSA burned or < 10% children) give oral fluid replacement therapy using as much ORS as the patient will tolerate

Adults: With 15% or more and children with 10% or more require i/v fluid resuscitation.

- Calculate according to Parkland formula:-
  Adults: 4mls per /kg body wt/ TBSA
  Children: 3mls per kg body wt/TBSA + maintenance
- Maintenance for children

20.2.2 Calculation of i/v fluid replacement

- The object is to maintain normal physiology as reflected by urine, vital signs and mental status
- Use **Ringer's lactate** i/v infusion or (if this is not available) **normal saline**, adding to each 1L 100 ml of dextrose 50% ml/kg x % BSA burned of solution for plasma expansion (eg. Haemaccel ®
- A general formula and dosage schedule that may be used for the first 24 hours is:
  Total volume of i/v infusion required (before above additions) = 4 ml/kg x % BSA burned plus normal daily requirement
- Give 50% of this total in the first 8 hours calculated from the time of burn
- Give 50% in the next 16 hours
- Give analgesic treatment *(Section 24.1 page 196)*
- Strong analgesia (e.g. Morphine or Pethidine) will be required for the first 48 hours
- Under aseptic conditions, gently cleanse the lesion with **cetrimide 15% + chlorhexidine 1.5%** diluted 1 part in 20 parts water

Alternative: Cleanse with **hydrogen peroxide solution** (10 vol) or soap and water

- Never use alcohol-based solutions
- Repeat the cleansing each day debriding the lesion and removing necrotic tissue as necessary
- Give tetanus toxoid vaccination *(see Section 12.3 page 100)*

If patient is developing signs of tetanus

- Give **tetanus antitoxin** (ATS**)** 1,500 units s/c or i/m

Once the lesion is clean/clear of necrotic tissue:

- Refer for skin grafting, if necessary, otherwise
- Dress the burn with **paraffin gauze dressing**
- Cover this with dry gauze dressing thick enough to prevent seepage through to the outer layers
- Change the dressing after 2-3 days, and then as necessary

If the burn becomes infected:

- Apply **silver sulphadiazine cream 1%** twice daily
- Before application, completely remove any old topical medication
- Cover with sterile gauze

If the patient becomes ill after burn infection:

- Carry out culture and sensitivity testing on the exudates
- Treat with systemic antibiotic(s) according to findings

20.3 Open wound

Management

- Clean and suture fresh wound (ie. > 6 hours old)
- Any skin damage overlying a fracture makes it an open fracture

Note*:* It is important to ascertain the cause of the wound. Do not suture penetrating wound.
Refer to the hospital.

- Clean fresh wounds with **Cetrimide 15% + Chlorhexidine solution 1.5%** diluted 1 in 20 parts water

Alternatively

- **Hydrogen peroxide solution** (10 vol)
- For local infiltration or as a peripheral nerve block use **Lignocaine hydrochloride** injection 1% maximum dose: adults 25ml; children 0.4 ml/kg

Alternatively

- **Lignocaine 1% + adrenaline 1:200,000 injection** Maximum dose: adults 40 ml, children 0.7 ml/kg

Note*:* Do not use anaesthetics containing adrenaline for anaethesia in digits or appendages due to risk of ischaemic necrosis

- Always remember to give **Tetanus Toxoid Vaccination** *(Section 12.3 page 100)*
- If patient has signs of tetanus give **Tetanus Antitoxin Serum** (ATS) 1,500 IU s/c or i/m
- If wound is grossly contaminated give **Tetanus Antitoxin Serum** 3,000 IU s/c or i/m

20.4 Insect stings and bites

20.4.1 Envenomation by insects

- Bees, wasps: Usually benign, but may provoke either laryngeal oedema or anaphylactic shock *(see Section 5.1.1 page 29)*
- Spiders, scorpions: The majority of spiders are benign. If a truly toxic species is thought to be responsible apply first aid and supportive measures as for snake bite *(see Section 20.5* below)

20.4.2 Snake bite

- Venom diffuses mainly via the lymphatics, not via blood vessels, tourniquets are thus of little use

a) First Aid Treatment

- Cleanse the would with **Cetrimide + Chlorhexidine solution 15% + 5% diluted 1 in 20**

Alternatively

- **Hydrogen peroxide solution (10 vol)**
- Apply film constant pressure to the site of the bite
- Apply a crepe bandage firmly to the entire limb
- Immobilize the patient for 12 hours observation
- Reassurance

Not all patients with snake-bite should be given **Anti-venom**

Administration of Snake Anti-venom

- Ensure that the anti-venom solution is clear
- Draw up 0.5 ml of adrenaline 1/1000 injection in a syringe ready for use s/c if needed
- Give 100 ml of the polyvalent antivenom as an iv infusion, diluted in 300 ml of normal saline

- Children: dilute in 0.4 ml/kg of saline
- Give the infusion slowly for the first 15 minutes (most reactions occur within this period
- Thereafter increase the rate gradually until the whole infusion is completed within 1 hour

If there is a history of allergy:

- The patient may still need to be given anti-venom because of systemic poisoning, but take particular care

If a reaction occurs:

- **Hydrocortisone** may need to be administered in addition to adrenaline

If there is no clinical improvement by the end of the infusion:

- Repeat the same dose as above

Note: Reserve **Polyvalent snake antivenom** (**anti-snakebite serum**) for patients with one or more of these signs and symptoms, hypotension, vomiting, neurotoxicity, haemotoxicity.

b) Supportive therapy

- Give reassurance – most snake bites are not dangerous
- Treat shock if any *(see Section 5.1.1 page 29)*
- Give an antihistamine:

Adults:

- **Promethazine** 25 mg/day or up to 8 hourly

Children > 6 months:

- 1 mg/kg/day given in divided doses every 12 hours
- Give **Tetanus Toxoid Vaccination** *(Section 12.3 page 100)*

If patient is developing signs of tetanus:

- Give **Tetanus Antitoxin (ATS**) 1,500 IU s/c or i/m
- **Benzyl penicillin** 2.4 MU once daily for 5 days
    - Children: 25,000 units/kg daily
- Eventually excise sloughs and graft skin early

20.5 Superficial injury, bruise, minor cut

General management

- Cleanse the wound with **Cetrimide 15% + Chlorhexidine solution 1.5%** diluted 1 in 20 parts water

Alternatively

- **Hydrogen peroxide solution (10 vol)**

If the patient is unimmunised or not fully immunized and the wound is grossly contaminated:

- **Tetanus Toxoid Vaccination** *(Section 12.3 page 100)*

If the wound is dirty

- **Benzylpenicillin** 2.4 MU i/m stat
  Children 25,000 units/kg

Then

- **Phenoxymethylpenicillin** 250 mg every 6 hours for 5 days
  (Children 25,000 units/kg)
- *If Penicillin hypersensivity*:
- **Erythromycin** 250 mg every 6 hours for 5 days

21.0 Renal Conditions

- Starts with upper complicated then acute lower Urinary tract conditions

21.1 Cystitis/Urethritis

Treatment

- Ensure adequate fluid intake
- For acute uncomplicated (all nonpregnant women, symptoms duration less than 1 week, not men or catheterized patients) give **Ciprofloxacin** 250mg orally every 2 hours for 3 days

Alternatively

- **Nitrofurantoin** 100mg every 6 hours with food for 7 days
- Consider urine microscopy, culture and sensitivity if no response or recurrent infections to guide treatment

21.2 Complicated Urinary tract Infections

- Includes men, pregnant women, catheterized patients, patients with abnormal urinary tracts and those with symptoms > 1 week

Treatment

- Give **Ciprofloxacin** 250mg orally twice a day for 5 days *or*
- **Co-amoxiclav** 375 mg 8hourly for 7 days

Alternatively

- Give **Gentamycin** 240mg i/m or i/v stat
- Followed by any of the above oral antibiotics
- Consider urine microscopy, culture and sensitivity if no response or recurrent infections to guide treatment

21.3 Upper Urinary tract Infections

- Pyelonephritis:
- Significant fever, rigors, vomiting, flank pain

Treatment

- **Ciprofloxacin** 250mg orally twice a day for 10-14 days *or*
- **Co-amoxiclav** 375 mg 8hourly for 10-14 days
- i/v fluids if clinically indicated

Alternatively

- **Gentamycin** 240mg i/m or i/v stat
- Followed by any of the above oral antibiotics for 10-14 days
- Refer patients with recurrent UTI for further investigations

21.4 Acute nephritic syndrome

- Most often occurs as a complication of a streptococcal infection
- Usually manifests itself 1-5 weeks after an episode of pharyngitis, impetigo, or infected scabies
- Affects mainly children <3 years old, and adults, who should be referred to a doctor

General measures:

- Monitor BP, urine output, weight
- Avoid added salt
- Treatment is usually supportive

Adults:

- **Phenoxymethylpenincillin** 500 mg every 6 hours for 7 days

If oedematous:

- **Frusemide** 40-80 mg once daily

If hypertension is present:

- Treat accordingly *(Section 2.3 page 9)*

21.5 Nephrotic syndrome

- Confirm the diagnosis: proteinuria, hypo-albuminaemia, edema, high cholesterol
- Investigate a possible cause

General measures:

- Adequate protein intake
- Restrict salt intake
- Monitor fluid intake and output
- Daily weight measurements

Treatment

Adults

- **Frusemide** 40-80 mg as a single dose each morning
- **Enalapril** 10-20 mg once daily (use with caution, stop if renal function deteriorates)
- A trial of steroids is indicated (responsiveness to steroids in adults is less than in children). **Prednisolone** 50-60 mg once daily for up to two months, tapering off is required after response.

If Schistosomiasis is diagnosed or suspected as cause:

- **Praziquantel** 40 mg/kg single dose

If presentation is acute:

- **Phenoxymethlyl penincillin** 500 mg every 6 hours for 7 days
- Refer to Nephrologist

21.6 Renal colic

Treatment

- Intravenous fluids
- Either **Morphine** or **Pethidine**. *(Section 24.9 page 199)*
- **Hyoscine butylbromide** 20 mg deep i/m stat
- Repeat after 30minutes if necessary
- Ensure fluid intake of 3-4 litres/day after the crisis
- Intravenous Pyelography is usually indicated

21.7 Renal failure (acute)

- Patients with acute renal failure should be referred to a hospital
- Carefully check the use of any drug in renal failure and reduce drug doses where required, see below

Symptoms and Signs include: oliguria, oedema, vomiting

- Look for clues for the cause of renal failure which include, shock, acute glomerulonephritis, use of herbal remedies containing nephrotoxins

Management

- Assess the hydration status of the patient
- Patients who are dehydrated will need fluid resuscitation
- Patients who are fluid overloaded will need fluid restriction and/or diuretics
- Restrict salt intake
- Weigh the patient daily
- Carefully monitor fluid intake and output on a chart
- Reduce the rate of rise of urea:
  - Give adequate calories
  - Restrict protein in the diet
- Treat hyperkalaemia:
  - Restrict potassium intake by restricting fruits, vegetables, meat and feezy drinks
  - If potassium is > 6.5mmol/l give **Insulin** 10 Units in 50ml of 50% dextrose infusion over 30mins
  - Give a **potassium binding resin** 30-60g orally
- Refer patient for dialysis if not responding to measures above

Indications for dialysis include:

- Hyperkalaemia
- Fluid overload
- Metabolic acidosis
- Pericarditis
- Confusional state (encephalopathy)

Note:

- Treat complications of renal failure such as convulsions, hypertension
- Do an HIV and Hepatitis B test before referral for dialysis

21.7.1 Use of medicines in renal failure/impairment

Note: Take great care when prescribing any medicine and carefully check medicine prescribing information (e.g. in BNF, MNF) regarding use in renal failure /impairment

Usually safe medicines:

- Doxycycline
- Erythromycin
- Penicillin
- Phenytoin
- Rifampicin

Use with care in reduced doses:

- Amoxycillin
- Chloramphenicol (avoid in severe impairment)
- Cotrimoxazole
- Diazepam
- Digoxin
- Insulin
- Isoniazid-containing medicines
- Pethidine(increase dose interval, avoid in severe impairment)
- Phenobarbitone
- Propranolol
- Antiretroviral medicines

Avoid using:

- ACE inhibitors (eg. Captopri)
- Aspirin and other NSAIDS (eg. Ibuprofen, Indomethacin)

- Codeine
- Ethambutol
- Gentamycin
- Nalidixic acid
- Nitrofurantoin
- Streptomycin

22.0 Poisoning

22.1 General principles of treatment

- Determine details of the poisoning:
  - What was the poison?
  - When did the poisoning take place?
  - What kind of poisoning took place? e.g. by swallowing, inhalation, contact with the skin or eyes
  - How much was taken?
- Prevent further exposure to the poison (if possible)
  - Remove contaminated clothing
  - Wash contaminated skin with soap and lots of cold water

Management

- Conserve body heat (if necessary)
- Maintain respiration
- Clear the airway
- Breathing-Maintain ventilation – use artificial respiration if necessary, patient may need ventilation
- Maintain BP/treat shock
  - Correct hypotension
  - Elevate the legs
  - Correct hypertension
  - In refractory shock discuss with anesthetist
- Maintain fluid balance
- Monitor fluid intake and output

22.2 Swallowed poisons

Treatment

- Prevent gut absorption
- Empty the stomach (if appropriate)
  - Only do this if within 4 hours of the poisoning and if the patient is conscious
- Do not empty the stomach if:
  - A corrosive substance was swallowed, e.g strong acid or alkali, bleach
  - Paraffin or a petroleum product was swallowed
  - The patient is unconscious or convulsing
  - The subsistence is not known

- Treat any complications as necessary
  - E.g. hypothermia, hypoglycaemia, convulsions, electrolyte or acid/base disturbances

22.2.1 Methods of emptying the stomach

1. Induction of vomiting

- Give **Ipecacuanha** emetic mixture
  - Children < 18 months: 10ml.
  - Children > 18 months: 15ml
  - Adults: 15-30 ml.
- Repeat after 20 mins if ineffective
- Follow this with 15 ml/kg of water

Note: It is essential to prevent any vomit from entering the lungs

2. Stomach wash-out (gastric lavage)

- Should only be done by staff familiar with the procedure
- Lie the patient head down on the left side
- Pass a wide gauge soft rubber tube (Ryle's tube) into the stomach
- Tube should be wide enough to allow large particles to pass through. e.g. tablets
  - Pour 300ml tap water down the tube
  - For children > 5years: use 100-200 ml water
  - For children < 5 years: use normal saline instead of water
  - Aspirate with the patient in the head down position, taking special note of the airway
  - Repeat lavage until aspirated fluid is clear

22.2.2 Use of activated charcoal

- 50-100g activated charcoal will prevent absorption of most medicines given within 1 hour of ingestion
- Only effective if given within 4 hours of poisoning when most of the poison is still in the stomach
- Only give activated charcoal after vomiting (induced or otherwise) has ceased
- Do not use ordinary charcoal – it will have no effect
- Do not use activated charcoal in the following situations:
  - If the patient is unconscious, drowsy or having fits, because of the risk of choking

- At the same time as, or just before giving, ipecacuanha or any oral antidote as it may bind these and prevent them working
- For poisoning by acids, alkalis, alcohol, iron and petroleum products

22.2.2.1 Administration of activated charcoal

- Add 50 g (children: 1 g/kg) to 400 ml water in a bottle
- Mix well by shaking until all the powder is wet
- Administer by the gastric lavage tube (unless the patient agrees to drink the charcoal slowly)
- Repeat if required after 4-6 hours

22.3 Paraffin, petrol and other petroleum products

- Includes paint thinners, organic solvents, etc
- The main danger from these is damage to lung tissue and liquid pneumonitis following aspiration

General measures

- Take great care to prevent the substance entering the lungs
- Do not make the patient vomit
- Do not do gastric lavage except:
  - Where the amount of paraffin, etc, swallowed was high (> 10 ml/kg) as these levels may cause brain damage
  - Only after endotracheal intubation under anaethesia
- Treat any pulmonary oedema and pneumonia as required
- Giving un absorbable oral liquid, e.g medicinal liquid paraffin

22.4. Iron poisoning

- A dose of 20 ml/kg of iron syrup or 2-3 iron tablets/kg may be fatal in children. Abdominal X-ray may show the number of tablets swallowed
- In severe cases there are risks of vomiting and gut haemorrhage in the acute stage and liver necrosis and shock after 1-2 days. Therefore observe the patient for at least 48 hours
- Remove any tablets by inducing vomiting and/or by gastric lavage

In less serious cases:

- **Desferrioxamine** 5-10g orally or by nasogastric tube in 50-100 ml of **sodium bicarbonate** solution 5%

In serious cases:

- **Desferrioxamine 15 mg/kg**/hour by i/v infusion in dextrose 5% or normal saline solution
    - Max: 80 mg/kg in each 12 hour period
- Continue until free of symptoms for 24 hours

22.5 Salicylate (Aspirin) poisoning

- Gastric empting is delayed
- Always empty the stomach
- Give repeated doses of **activated charcoal** to delay absorption of any remaining poison (See *Section 22.2.2.1 page 184*)
- Watch for and treat hypoglycaemia, convulsions and metabolic acidosis
- In severe cases:
    - **Darrow's ½ strength in dextrose 5%** infusion with added **sodium bicarbonate** (30 mmol/litre) may be needed to increase renal excretion or ringers lactate

22.6 Organophosphate or carbamate poisoning

- Very toxic chemicals found in insecticides and pesticides, eg. Some rat poisons
- Poisoning may be by ingestion, inhalation or absorption through the skin
- Presents with anxiety, restlessness, small pupils, increased secretions and bradycardia

Management

- Remove any contaminated clothing
- Establish and maintain airway
- Artificial respiration with oxygen may be required at any stage during the first 24 hours after poisoning
- Empty the stomach if poison swallowed
- If there is skin contact with the poison, wash them thoroughly
- Wear rubber gloves to prevent contamination
- Do not rub the skin
- Shave hair if heavily contaminated
- Give **Atropine** 1.2mg i/v or i/m (children: 0.05 mg/kg)
- Then give 0.6 mg (children: 0.05 mg/kg) every 10 minutes as required to achieve and maintain atropinisation (hot dry skin, dry mouth, widely dilated pupils, fast pulse)

In severe organophosphate poisoning:

- Give an initial **Atropine** dose of 4-6mg (children: 2 mg)

- Repeat 2 mg every 10 minutes as required to achieve and maintain full atropinisation
- Total needed in first 24 hours is usually < 50 mg
- High dose **Atropine** may be required for several days

In severe organophosphate poisoning only and in cases not responding to atropine:

- Give **Pralidoxime mesylate** 1-2g concurrently with **Atropine**
  Children: 20-40 mg/kg
- Administer by slow i/v (over 15-30 minutes) as a 5% solution in water for injections
- If i/v not possible: give i/m or s/c
- repeat once or twice at 4-6 hour intervals if needed
- If possible: monitor treatment by determination of blood-cholinesterase concentrations

Do not give pralidoxime (or other oximes) in carbamate poisoning

22.7 Paracetamol poisoning

- Paracetamol is an ingredient of many over the counter pain cold flu remedies
- A dose over 150 mg/kg (ie. approx 10 g in an adult) may cause severe liver and (less frequently) kidney damage within hours of ingestion
- In the first 24 hours there may be nausea and vomiting or there may be no sign of poisoning
- Persistence of these symptoms and associated right subcostal pain and tenderness usually indicates hepatic necrosis
- Liver damage reaches a maximum 3-4 days after poisoning and may be fatal

Even if there are no significant early symptoms, overdose patients should be urgently transferred to hospital

If overdose occurs within 4 hours of admission:

- Empty the stomach to remove ingested medicine
- If respiration is depressed: do not use emesis – use airway protected gastric lavage instead
- Keep patient warm and quiet
- Observe carefully for at least 3-4 days
- Monitor fluid, electrolytes, blood glucose, liver and kidney function

- Give supportive care and correct fluid and electrolyte balance as required

If within 24 hours of overdose with over 10g of paracetamol:

- Give the specific antidote **N-acetylcystine** as an i/v infusion in **Glucose 5%**
    - Initially give 150mg/kg in 200ml over 15 minutes
    - Then give 50 mg/kg in 500 ml over 4 hours
    - Then give 100mg/kg in 1 over 16 hours

If a serious reaction occurs:

- Stop the infusion
- Treat the reaction (*see Section 5.1.1 page 29*)
- Restart the infusion

23.0 Nutritional disorders (adults)

23.1 Definition of malnutrition

Adults:

- Severe malnutrition = BMI<16 *or* presence of bilateral oedema with MUAC <21.9cm (oedema should be assessed by a clinician for medical causes) *or* MUAC < 19cm (to be used only if BMI cannot be taken)
- Moderate malnutrition = BMI 16-16.9 *or* MUAC 19 - 21.9cm (to be used only if BMI cannot be taken)

Pregnant and lactating women

- Severe malnutrition = MUAC <19cm
- Moderate malnutrition (where SFP is not present) = MUAC 19 - 21.9cm

Adolescents 12-18 years

- Severe malnutrition = Weight/Height <70% *or* presence of bilateral oedema (oedema should be assessed by a clinician for medical causes)
- Moderate malnutrition = Weight/Height between 70-79%

Children

- Severe malnutrition - child who is < 70% of expected weight for age, or <80% but with generalized oedema or MUAC <11 cm for a child who is > $^{6}/_{12}$
- Moderate malnutrition – child who is > 70% of expected weight for age, or <80% but with mild edema of the feet or MUAC 11-11.9cm.
- Mild malnutrition - child who is failing to gain weight for 3 months or who is below the green path (< 85% expected weight for age)

23.2 Management of Malnutrition in Adolescents and Adults

- Refer to *Government of Malawi, Ministry of Health, Interim Guidelines for the Management of Acute Malnutrition in Adolescents and Adults*
- All ambulatory adults and patients should be treated as outpatients
- The ready to use therapeutic food (RUTF) should be used in combination with a normal diet

23.2.1 Treatment of severe malnutrition

- 2 pots of Ready to use therapeutic food (RUTF) (260g, 2700 kcal) per day
- 6 sachets of RUTF (92g, 3000 kcal) per day

- If patients achieves BMI of 17 or MUAC of 22cm (in adolescents weight/height >70%) then treat as moderate malnutrition *(see Section 23.2.2 below)*

23.2.2 Treatment of moderate malnutrition

- 1 pot of RUTF (260g, approx 1500 kcal) per day OR
- 3 sachets RUTF (92g per sachet, 1500 kcal) per day OR
- 9kg of Likuni Phala (containing 10% sugar) and one litre of
- Vegetable oil per month (1500 kcal per day)

23.2.3 Outpatient follow up

- Follow up patients monthly.
- Plot their weight gain.
- All patients not responding after three months should be reviewed by a clinician.
- If not medically indicated, treatment can continue for up to six months after initiation, or if HIV infected up to three months after commencing ART.

23.2.4 Use of milk based formulations F75 and F100

- Patients requiring NG feeding cannot tolerate RUFT or are severely ill require milk
  based formulations F75 and F100 feeds.
- Milk based formulations are given in two phases.
- Patients should be weighed twice weekly.

23.2.4.1 Phase 1

- Use F75 to stabilize patient
- Treat infections and other urgent medical problems
- Provide sufficient energy and nutrients to stop further loss of muscle and fat tissue
- Correct fluid and electrolyte imbalance
- Give at least 5-6 feeds per day.
- Night feeds may be helpful, particularly with NG tube feeding.

How to prepare F75

- Mix one packet of F75 with 2 litres of cooled boiled water to make 2400ml of formula.
- Give the amounts as in the Table 29 below unless patient is receiving i/v fluids in which case amounts should be reviewed.
- Intravenous fluids are discouraged in severe malnutrition as they have little nutritional value, and can cause fluid overload.

Table 29: Amounts of F75 given to patients in Phase 1

Class of weight (kg)	8 feeds per day ml for each feed	6 feeds per day	5 feeds per day
15.0-19.9	260	300	400
20.0-29.9	300	350	450
30-60	350	400	500

- Patients should not eat any other foods or fluids, during Phase 1 unless they
  have diarrhoea.
- Patients with diarrhea should be given ORS (Resomal).

23.2.4.2 Transition Phase

- Change to F100 as soon as the patients appetite returns
- Control the amount of F100 during the transition phase to avoid the risk of heart failure.
- RUTF may be introduced at this stage in addition to F100 so patients are familiar with it when they reach Phase 2.
- Give 1 pot (or 3 sachets) of RUTF over the 2 day transition period as a taste dose.
- The patient is not required to finish the RUTF.
- The number of feeds, their timing and the volumes given remains exactly the same.
  F100 (100ml = 100kcal) is used in the transition phase.
- Patients should normally move to Phase 2 after 2 days on Transition phase.
- Patients with NG feeding tubes should remain on transition phase quantities but these should be reviewed if NG feeding continues for more than two weeks

How to prepare F100

- Mix one packet of F100 with 2 litres of cooled boiled water to make 2400ml of formula.
- Give the amounts as in the Table 30 below to each patient unless receiving i/v fluids in which case amounts should be reviewed.

Table 30: Amounts of F75 given to patients in Phase 1

Class of weight (kg)	8 feeds per day ml for each feed	6 feeds per day	5feeds per day
15-19.9	260	300	400
20-29.9	300	350	450
30-60	350	400	500

23.2.4.3 Phase 2

- Aim of phase 2 is to achieve rapid weight gain and rebuild lost tissues and this requires more energy, protein and micronutrients than were needed for Phase 1.
- F100 without iron is given during this phase.
- Give the amounts as in Table 31 below to each patient

Table 31: Amounts of F100 given in Phase 2

F100 (ml) per feed phase 2 for 6 & 5 feeds

Class of weight (kg)	Ml per feed 6 feeds per 24 hours	Ml per feed 5 feeds per 24h
15.0-19.9	550	650
>20	750	900

- Give one tablet of **Fefol** 200mg or **Ferrous sulphate** 200mg per day in phase 2 if clinically indicated.
- If inpatient is well and can tolerate solid food, RUTF should be used in Phase 2 instead of F100.
- RUFT treatment is the same as per for outpatients and should be used alongside a normal diet.
- Give the amounts below until patients BMI reaches 17
    - 2 pots of RUTF (260g, 2700 kcal) per day
    - 6 sachets of RUTF (92g, 3000 kcal) per day
- Once patient achieves a BMI of 17 or MUAC 22cm (if BMI can not be taken), or
  Weight/Height>80% they should be transferred to treatment for moderate malnutrition

23.2.5 Discharge criteria (when to stop treatment of malnutrition)

- *Adults* - BMI of 18.5 *and* bilateral oedema has gone for 10 consecutive days *or* MUAC 23cm (to be used only if BMI can not be taken)
- *Pregnant and lactating women up to 6 months after delivery* - MUAC 23cm
- *Adolescents 12-18 years* - Weight/Height >85% *and* bilateral oedema has gone for 10 consecutive days

23.3 Malnutrition (protein-energy) in Children

23.3.1 Mild malnutrition

- Do a full assessment, especially looking for underlying disease such as TB, HIV infection, etc
- Ensure weekly attendance at nutrition clinic
- Give food supplements
- Give **Vitamin A** 100,000 units as a single dose

23.3.2 Moderate malnutrition

- Refer to Supplementary Feeding Programme centre.
- Do a full assessment, especially looking for underlying disease such as TB, HIV infection, etc.
- Give **Vitamin A** 200,000 units
    - Child < 1 year: 100,000 units
    - **Ferrous sulphate** paediatric mixture 2.5 mL
    - **Folic acid** 5 mg daily
    - **Albendazole** 400 mg stat

23.3.3 Severe malnutrition

- Must be admitted to hospital
- Do a full assessment, especially looking for underlying disease such TB, HIV infection, etc
- Assess ***dehydration*** (see *Section 7.5.1.4 page 46*)
    - Skin turgor is not a reliable sign in these children
    - Look for tears, sunken eyes or fontanelle
    - Assess urine output.

- Prevent and/or correct dehydration (see *Section 6.1 page 36)*)
- The fluid tolerance of these children is limited. **ReSoMal** and especially i/v solutions may cause fluid overload and heart failure

Avoid fluid overload in severe malnutrition

  - Non-dehydrated children with mild diarrhea should continue milk feeds to prevent dehydration – they do not need **ReSoMal**
  - whenever possible, rehydrate these children orally using **ReSoMal**
  - to prepare this see above)
  - If i/v rehydration is necessary, limit this to a few hours. Continue feeding and rehydrate orally as soon as possible see above.
  - Start an intensive feeding regime with high energy milk:
  - Administration via NGT is necessary in many children with poor appetite
  - Start with 2-hourly feeds then reduce to 3-hourly
  - Start with **F-75** refer to severe malnutrition manual
  - Move to **F-100** when the child is stable refer to severe malnutrition manual.

Frequent feeds spaced throughout the whole 24 hours are essential to prevent hypoglycaemia

- Provide antibiotic cover for 5 days
  - **Cotrimoxazole** 24 mg/kg every 12 hours

  Alternatively if sepsis suspected or child very ill:
  - **Benzylpenicillin** 50,000 units/kg i/m or i/v every 6 hours, and
  - **Gentamycin** 6 mg/kg i/m or i/v once daily
    - *Alternatively to Gentamycin*:
  - **Chloramphenicol** 25 mg/kg i/m or i/v every 8 hours

  If the child improves, then switch to oral Ciprofloxacillin for 5 days.
- ***Give supplements***:
  - **Vitamin A (retinol**) 200,000 units on days 1,2 and 8
  - Children < 1 yr :100,000 units (½ capsule)
  - **Give Multivitamin syrup** 5 mL daily for 1 week
  - **Potassium** 1 mmol/kg every 6 hours for 2 weeks mixed with feeds
    - To prepare a stock solution: add 7.5g of potassium chloride to 1L of pure water. This gives 1 mmol potassium chloride/mL
    - One potassium chloride slow-release (*Slow K* ® tablet = 13 mmol of K+

From day 7:

- **Ferrous sulphate** paediatric mixture 2.5 mL every 12 hours for 2 weeks p*lus* **Folic acid** 5mg daily for 5 days
- **Albendazole** 400 mg single dose, when recovering
  - Children<2 give 200 mg
- **Treat complications**:

a) Hypothermia:

- Re-warm
- Consider the possibility of sepsis or hypoglycaemia

b) Hypoglycaemia:

- Give **Dextrose 50%**
  - See *Section 5.4 page 33* for dilution, dose, administration
- Then give F_75 orally or via NGT as soon as possible and recheck the blood sugar after 1 hour.

Hypothermia and hypoglycaemia are frequently signs of sepsis. Consider sepsis treatment if present

c) Cardiac failure:

- **Frusemide** 1-2 mg/kg i/v or i/m
- Digoxin is contraindicated in kwashiorkor

d) Severe anemia:

- Transfuse 10 mL/kg packed cells

e) Mouth ulceration:

- If not severe use **GV paint**.

If severe like cancrum oris use:

- **Benzylpenicillin** 25,000 units/kg per dose I/m every 6 hours and
- **Metronidazole** 7.5 mg/kg every 8 hours for 7 days

f) Skin ulcers:

- Soak lesion with **potassium permanganate 1% solution** for 10-15 minutes *then*
- Apply a **paraffin gauze** dressing

23.4 Pellagra

- Usually multiple vitamin deficiency is present and other vitamins may therefore be necessary

- **Nicotinamide** 50 mg every 8 hours for 28 days

23.5 Vitamin A deficiency, xerophthalmia

- **Vitamin A** is a prophylactic vitamin A supplementation to all children 6 months-5 years old (every 6 months) nursing mothers and to risk groups at every available opportunity

Xerophthalmia is a medical emergency

Treatment

Adults

- **Vitamin A** 200,000 units/ dose on days 1, 2, and 8

Children

- **Vitamin A** < 1:100,000 units/ dose (=½ capsule) on days 1, 2, and 8

24.0 Pain management and Palliative care

- Palliative care is an approach that improves the *quality of life* of patients and their families facing the problems associated with *life threatening illness*, through the *prevention* and *relief of pain and suffering* by means of *early identification* and *impeccable assessment and treatment of pain* and other problems – *physical, psychosocial and spiritual*

24.1 Principles of analgesic use for chronic pain

- By the clock
  - Regular analgesia is necessary as patients require prevention therapy towards their persistent pain
  - Medication given when required for chronic pain does not work.
- By the mouth: oral medication is the standard preferred in chronic pain.
- By the ladder
  - Three step analgesic ladder with treatment moving up as pain increases should be used when prescribing analgesics.

- By the patient: Dosage is determined on an individual basis.

24.2 Mild Pain

- **Paracetamol** 500mg - 1g very 4-6 hours (max 4g daily)
- NSAIDS anti – inflammatory effects are good for metastatic bone and soft tissue pains.
- **Aspirin** 300-900mg every 4-6 hours,

- **Ibuprofen** 1.2-2.4g daily in 3-4 divided doses (max 2.4g daily), children >7kg 20mg/kg (max 40mg/kg/day)

Note:

a) Do not give NSAIDS to children under 16 years because of the risk of Reye's syndrome.
b) Aspirin causes gastric irritation and ulceration, therefore administer with food and milk
c) Do not use aspirin or other NSAIDs (e.g. ibuprofen, indomethacin, diclofenac) in patients with symptoms suggesting gastritis or peptic ulcer disease, pregnancy or bleeding disorders.
d) Do not use two NSAIDS at the same time, but where pain control with paracetamol or an NSAID *alone* is inadequate, a *combination* of the two drugs may be effective

24. 3 Moderate Pain

- **Codeine phosphate** 30-60mg every 4 hours (max 240mg daily), children > 1 year 3mg/kg in divided doses every 4 hours.
- Can be combined with non-opiates and/or adjuvants, but not with morphine.
- **Tramadol** 50-100 mg every 8 hours oral.
- Always prescribe codeine with a laxative (not tramadol) e.g. **Bisacodyl** 10mg at night, unless the patient has diarrhoea.

24.4 Severe Pain

- Use these along with non-opiods for severe pain
- Oral **Morphine** (1 mg/ml) solution starting dose 2.5ml 4 hourly titrating upwards every 12 hours to achieve pain control
- In opiate naïve patients where no oral morphine solution is available start with Morphine 10mg tablets twice daily and titrate upwards (take 24-28 hours to reach steady state level).
- May be given together with step 1 drugs (non-opioids) and/or adjuvants.
- Always prescribe a laxative e.g. **Bisacodyl** 10mg at night unless the patient has diarrhea.
- Nausea and vomiting are common side effects and may require medical management, see below.
- Morphine does not have a ceiling effect and must be titrated up to gain effective control of pain

Note:

Pethidine is no longer recommended for use in chronic pain due to its short duration of action and its side effects.

24.5 Adjuvant analgesics

- Miscellaneous group of drugs which relieve pain in specific circumstances.
- Generally given in addition with analgesics from the ladder.

24.5.1 Corticosteroids

- Can be helpful in reducing tumour related oedema e.g. liver capsule pain, nerve compression. Combination of a steroid and opioid is usually effective.
- **Dexamethasone** 4 - 8mg in divided doses daily for a minimum of 10 days or **Prednisolone** 30 - 50mg daily for 10 days
- Then reduce gradually to lowest effective dose, depending on prognosis.

24.5.2 Anti-depressants and Anti –convulsants

- Helpful for neuropathic pain, which may present as burning, pricking, allodynia, paraesthesia or sharp, shooting pain.
- **Amitryptiline** 25mg at night. Dose can be increased slowly up to 75mgs.
- **Phenytoin** 100mg every twelve hours; maybe increased slowly to 100mgs tds.
- **Carbamazepine** 100 - 200 mg every 8 hours.

24.5.3 Antispasmodics

- Helpful in relieving visceral distension pain and colic.
- **Hyoscine butylbromide** 10-20mg every 8 hours tds orally or i/m..

24.5.4 Muscle relaxants

- Helpful in painful muscle spasms (cramps) and myofascial pain.
- **Diazepam** 2.5mg every 8 hours may be beneficial.

24.6 Management of neuropathic pain

- *Causes*: HIV infection, diabetes mellitus, drug side effects i.e. (isoniazid, stavudine, vincristine) and other chemotherapeutic agents.
- Start with simple analgesia e.g. **Ibruprofen** 200-400mg every 8 hours
- If the patient is taking isoniazid start **Pyridoxine** 50 mg every 8 hours for the duration of treatment;

- Iin patients on T30 and TB treatment Pyridoxine 25 mg should be started prophylactically, at the start of TB treatment
- Add **Amitryptilline** 12.5mg-25mg (up to 75mg) at night if pain is not controlled
- Add oral **Morphine** liquid 2.5mg four hourly if pain is not controlled and titrate upwards until pain is controlled
- If severe peripheral neuropathy with motor deficit occurs on ARVs (stavudine is the commonest offender) refer to the MOH ART guidelines

Note: Neuropathic pain may not respond fully to opiates in which case the oral morphine may be continued and an alternative adjuvant e.g. Carbamazepine 100mg every twelve hours should be tried

24.7 Nausea and Vomiting

- Identify cause and treat
- Review drug treatment and stop unnecessary drugs
- Treat pain adequately using the analgesic ladder antiemetics
- **Metoclopramide** 10mg every 8 hours – given 30 minutes before eating – can speed gastric emptying
- **Promethazine** 25mg every 8 hours
- If ineffective use **Haloperidol** 0.5-1.5mg at night, or trial of steroids: **Prednisolone** 30mg daily or **Dexamethasone** 4mg daily for 5 days

24.8 Hiccup

- Look for treatable causes such as uremia and raised intra-cranial pressure.

Treatment

- **Chlorpromazine 25mg** every twelve hours or when required during attacks (although its sedative effect may distress the patient).
- **Metoclopramide** 10mg every 8 hours or when required.
- **Haloperidol** 0.5mg every twelve hours orally or 1.5mg i/m during attacks.

24.9 Management of acute pain

- Paracetamol and NSAIDs (aspirin and brufen) are effective in many cases,
- For doses and other information *see Section 10.1 page 91* on chronic pain.
- Inhaled **Nitrous oxide** provides fast onset and short acting analgesic effect and therefore has a special role in, for example, obstetrics and wound dressing.

- **Ketamine** is used for emergency analgesia and anaesthesia.
- Opiods are first line treatment for severe acute pain including procedures related pain

Dose

Adults:

- **Pethidine** 50-100mg i/m 4 hourly; restrict use to 48-72 hours duration.
- **Morphine** 10mg i/m; 2.5mg i/v every 4 hours, oral morphine liquid (1mg/ml) 2.5ml every 4 hours

Children:

- 1-12 months **Morphine** s/c or i/m 200ug/kg,
- 1-5 years **Morphine** s/c or i/m 2.5-5mg,
- 6-12 years **Morphine** s/c or i/m 5-10mg 4 hourly,
  Oral morphine liquid 200ug/kg every 4 hours

Note:

a) Concomitant use of laxatives and anti-emetics is recommended to avoid constipation
b) Addiction is not a problem with opioid use in acute pain.
c) Respiratory depression may occur if opiates are given to patients without pain or at too high a dose.
d) Key principle for safe and effective use of opioids is to titrate the dose against the desired pain relief and minimize unwanted effects.
e) If the patient is still complaining of pain after all of the drug has been delivered and absorbed then it is safe to give another, usually smaller, dose.
f) If the second dose is also ineffective repeat the process or change the route of administration to achieve faster control.
g) Delayed release formulations, e.g MST tablets should not be used in acute pain

24.10 Local anaesthetic blocks

- Regional anaesthesia (epidural, caudal, or specific LA blocks) can provide useful post-operative pain relief,
- It should be performed by trained staff who are aware of the risks and dose requirements.

INDEX

1. Anaesthetics

1.1 General anaesthetics

1	Halothane	inhalation	DVA
2	Ketamine HCl	inj, 50 mg/mL, 10 mL amp	DVA
3	Thiopentone sodium	injection, 0.5 g vial PFR	DVA
4	Ether, anaesthetic	inhalation	DVA
5	Nitrous oxide	medical gas	CEB

1.2 Local anaesthetics

1	Lignocaine HCl	injection, 1%, 25 ml vial	HEA
2	Lignocaine HCl + adrenaline	dental cartridges, 2% + 1/80,000, 2.2 mL	HEA
3	Lignocaine HCl + glucose	injection, heavy spinal, 5% + 7.5%	DVA
4	Lignocaine HCl	gel, 2%, 30 g tube	DEA
5	Lignocaine HCl	injection, 2%, 20 mL vial	CVB
6	Lignocaine HCl	spray, 10%	CEB

1.3 Preoperative medication

1	Atropine sulphate	injection, 600 micrograms/mL 1 mL amp	DVA
2	Diazepam	inj, 5 mg/mL, 1 mL amp	DVA
3	Morphine sulphate	inj, 15 mg/mL, 1 mL amp	DVA
4	Pethidine HCl	inj, 50 mg.mL, 2 mL amp	DVA
5	Diazepam	tablet, 5 mg	DEA
6	Promethazine	tablet, 25 mg	DEA
7	Promethazine HCl	elixir, 5 mg/5 mL	DEA
8	Promethazine HCl	inj, 25 mg/mL, 2 mL amp	DEA
9	Morphine sulphate	tablet, slow-release, 10 mg	DVB

2. Analgesics, antipyretics, and related agents

2.1 Non-opioid analgesics, antipyretics

1	Aspirin	tablet, 300 mg[1]	HVA
2	Paracetamol	tablet, 500 mg	DVA
3*	Diclofenac sodium	tablet, 25 mg	DEA
4*	Ibuprofen	tablet, 200 mg	DEA
5	Indomethacin	tablet, 25 mg	DEA

[1] Max. supply at H level = 6 tablets only 9except when used for arthritis)

6	Mefenamic acid	capsule, 250mg	DVA

2.2 Opioid analgesics and antagonists

1	Morphine sulphate	inj, 15 mg/mL, 1 mL amp	DVA
2	Pethidine HCl	inj, 50 mg.mL, 2 mL amp	DVA
3	Codeine phosphate	tablet, 15 mg	DEA
4*	Dihydrocodeine tartrate	tablet, 30 mg	DEA
5	Naloxone HCl	injection, neonatal, 20 micrograms/mL, 2 mL amp	DEA
6	Morphine sulphate	tablet, slow-release, 10 mg	DVB
7	Morphine sulphate	solution, 5mg/5ml, PFR	DVA
8	Tramadol	capsule, 50mg	DEB

3. Antiallergics

3.1 Antihistamines

1	Chlorpheniramine maleate	tablet, 4 mg	HEA
2	Chlorpheniramine maleate	injection, 10mg/ml, amp	DVA
3	Promethazine	tablet, 25 mg	DEA
4	Promethazine HCl	elixir, 5 mg/5 mL	DEA
5	Promethazine HCl	inj, 25 mg/mL, 2 mL amp	DEA
6	Cetirizine	tablet, 10mg	DEB

6.2 Medicines used in nasal allergy

1	Beclomethasone dipropionate nasal spray, 50micrograms/spray		DEB

4. Antidotes and other medicines used in poisonings

1.	Ipecacuanha	emetic mixture, paediatric	HEA
2.	Atropine sulphate	inj, 600 micrograms.mL 1 ML amp	DVA
3*	Acetylcysteine	inj, 200 mg/mL, 10 mL amp	DVB
4*	Activated charcoal	powder	DVB
5*	Desferrioxamine	injection, 500 mg vial (PFR)	DVB
6	Pralidoxime mesylate	inj, 200 mg/mL, 5 mL amp	DVB

5. Antiepiletics and anticonvulsants

1	Paraldehyde	injection, 10 mL amp	HVA
2	Phenobarbitone sodium	tablet, 30 mg[2]	HVA

[2] At H level, for use in epilepsy only

3	Phenobarbitone sodium	inj, 200 mg/mL, 1 mL amp[3]	HVA
4	Diazepam	inj, 5 mg/mL, 2 mL amp	DVA
5*	Magnesium sulphate	inj, 500 mg/m, 2 mL amp	DVA
6	Pheytoin sodium	tablet, 100 mg	DVA
7	Phenytoin sodium	inj, 50mg/ml, amp	DVA
8	Carbamazepine	tablet, 200 mg	DEB
9	Sodium valproate	tablet, 200 mg	CVB
10	Ethosuximide	capsule, 250 mg	CEB

6. Anti-infectives

6.1 Anthelmintics

6.1.1 Intestinal anthelmintics

1	Albendazole	tablet, 200 mg	HEA
2	Niclosamide	tablet, chewable, 500 mg	DEB

6.1.2. Antifilarials

1	Ivermectin	tablet, 6 mg	DVB

6.1.3 Antischistosomals

1	Praziquantel	tablet, 600 mg	HEA

6.2 Antibacterials

6.2.1. Penicillins and cephalosporins

1	Benzathine Benzylpenicillin	injection, 1.44 g vial PFR (=2.4 MU)	HVA
2	Benzylpenicillin	inj, 4 g vial PFR (=5 MU)	HVA
3	Phenoxymethypenicillin	tablet, 250 mg	HVA
4	Amoxycillin	capsule, 250 mg	DVA
5	Amoxycillin	elixir, 125 mg/5 mL	DVA
6	Amoxicillin + clavulanic acid	tablet, 500 + 125mg	CEA
7	Ampicillin sodium	inj, 250 mg vial PFR	DVA
8	Flucloxacillin	capsule, 250 mg	DVA
9	Flucloxacillin	elixir, 125 mg/5 mL	DVA
10	Flucloxacillin	inj, 250 mg vial PFR	DVA
11	Cefotaxime	inj, 500 mg PFR	DVA
12	Cephalexin	capsule, 250 mg	DVA
13	Cloxacillin	capsule, 250mg	DEA

[3] At H level, for use in convulsions only

14	Ceftriaxone	inj, 1g PFR	DVA
15	Procaine penicillin	injection, 4.8 MU vial	CVB

6.2.2 Other antibacterials

1	Chloramphenicol sodium Succinate	injection, 1 g vial PFR HVA	
2	Co-trimoxazole (Sulphamethoxazole + Trimethoprim)	tablet, 480 mg (400 mg + 80 mg)	HVA
3	Doxycline	tablet, 100 mg	HVA
4	Erythromycin	tablet, e/c, 250 mg base	HVA
5	Gentamicin	injection, 40 mg (as sulphate) mL, 2 mL vial	HVA
6	Metronidazole	tablet, 200 mg	HVA
7	Chloramphenical	capsule, 250 mg	
8	Erythromycin ethyl succinate	susp, 125 mg/5 mL (of erythromycin base)	DVA
9	Metronidazole	inj, 5 mg/mL, 100 mL vial (for i/v infusion)	DVA
10*	Metronidazole	suspension, 200 mg/5 mL	DVA
11	Nalidixic Acid	tablet, 500 mg	DVA
12	Chloramphenicol	suspension, 125 mg/5 mL	DEA
13	Gentamicin	paediatric injection, 10 mg (as sulphate)/mL, 2 mL vial	DEA
14	Nitrofurantoin	tablet, 50 mg	DEA
15	Ciprofoxacin	tablet, 250 mg	CVB
16*	Nitrofurantoin	suspension, 25 mg/5 mL	CVB
17	Sodium fusidate	tablet, 250 mg	CVB
18	Azithromycin	capsule, 250mg	CEA

6.2.3 Antileprosy medicines

1	Clofazimine	capsule, 50 mg	DVA
2	dapsone	tablet, 100 mg	DVB
3	Rifampicin	capsule, 150 mg	DVB

6.2.4 Antituberculosis medicines

1	Ethambutol HCI	tablet, 400 mg	DVA
2	Isoniazid (INH)	tablet, 100 mg	DVA
3	Isoniazid + ethambutol	tablet, 150 mg + 400 mg (fatol ®)	DVA
4	Pyrazinamide	tablet, 400 mg	DVA
5	Rifampicin + isoniazid	tablet, 100 mg + 50 mg	DVA

6	Streptomycin sulphate	injection, 5 g vial PFR	DVA
7	Capreomycin	injection 1g, vial PFR	CVA
8	Kanamycin	injection 1g vial PFR	CVA
9	Amicacin	injection 1g vial PFR	CVA
10	Ethionamide	tablet 250mg	CVA
11	Ofloxacin	tablet, 400mg	CVA
12	Cycloserine	tablet 250mg	CVB

6.3 Antifungals (oral/parenteral/vaginal)

1	Nystatin	pessary, 100,000 units[4] (with applicator)	HVA
2	Clotrimazole	vaginal tablets , 100mg	DEA
3	Gentian violet	paint, aq, 0.5%, 500 mL	HEA
4	Ketoconazole	table, 200 mg	DVA
5*	Ketoconazole	suspension, 100 mg/5 mL	DVA
6	Griseofulvin	tablet, 125 mg	DEA
7	Fluconazole	capsule, 250 mg	DVA
8	Fluconazole	i/v infusion, 2 mg/mL, 25mL	DVA
9	Fluconazole	oral liquid, 50mg/ml	DVA

6.4 Antiprotozoal medicines

6.4.1 Antiamoebics

1.	Metronidazole	tablet, 200 mg	HVA
2*	Metronidazole	suspension, 200 mg/5 mL	DVA

6.4.2 Antimalarials

1	Artemether+ Lumefantrine	tablet, 20mg + 120mg	HVA
2	Artesunate + Amodiaquine	tablet,	DVA
3	Sulfadoxine + Pyrimethamine (SP)	tablet, 25 mg + 500 mg	HVA
4	Quinine dyhydrochloride	inj, 300 mg/mL, 2 mL amp	HVA
5	Proguanil HCl	tablet, 100 mg	DVA
6	Quinine sulphate	tablet, 300 mg	DVA
7	Chloroquine phosphate	tab, 250 mg (150 mg base)	DEB
8*	Halofantrine	suspension, 100 mg/5 mL	CVB
9	Mefloquine hydrochloride	tablet, 250mg	CEB

6.4.3 Antitrypanosomals

1	Melarasoprol B	inj, 3.6% solution, 6 mL amp	DVB

[4] May be used for oral thrush (pessary is sucked)

2	Suramin sodium	injection, 1 g vial PFR	DVB

6.4.4 Anti-toxoplasmosis medicines

1	Co-trimoxazole	tablet, 480 mg	HVA

6.5 Antiviral medicines

6.5.1 Antiherpes medicines

1	Acyclovir	tablet, 200mg	HVA
2	Acyclovir	cream	HVA

6.5.2 Antiretrovirals

6.5.2.1 Nucleoside/Nucleotide reverse transcriptase inhibitors

1	Didanisone (ddI)	tablet,chewable, 50mg	
2	Stavudine (d4T)	tablet, 30mg	
3	Lamivudine (3TC)	tablet, 150mg	
4	Tenofovir (TDF)	tablet, 300mg	
5	Abacavir (ABC)	tablet, 300mg	
6	Zidovudine(AZT)	tablet, 300mg	

6.5.2.2 Non nucleoside/Nucleotide reverse transcriptase inhibitors

1	Efavirenz (EFV)	tablet, 600mg	
2	Nevirapine (NVP)	tablet, 200mg	HVA

6.5.2.3 Non nucleoside/Nucleotide reverse transcriptase inhibitors

1	Lopinavir + Ritonavir (LPV/r)	capsule 133.33mg + 33.3mg	

6.5.2.4 Fixed dose combinations

1	Stavudine (d4T) + Lamivudine (3TC) + Nevirapine (NVP)	tablet, 30mg + 150mg +200mg	
2	Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP)	tablet, 300mg + 150mg + 200mg	
3	Zidovudine (AZT) + Lamivudine (3TC)	tablet, 300mg + 150mg	

7. Anti-migraine medicines

1	Propranolol HCI	tablet, 40 mg	DVA

8. Antineoplastic and immunosuppressant medicines

1	Actinomycin D	inj, 500 microgram vial PFR (with mannitol)	CVB
2	Busulphan	tablet, 2 mg	CVB
3	Cyclophosphamide	injection, 200 mg vial PFR	CVB
4	Vincristine sulphate	injection, 1 mg vial PFR	CVB
5	Chlorambucil	tablet, 2 mg	CEB
6	Cyclophosphamide	tablet, 50 mg	CEB
7	Melphalan	tablet, 2 mg	CEB
8	Methotrexate	tablet, 2.5 mg	CEB
9	Methotrexate	inj, 2.5. mg/mL, 1 mL amp	CEB

9 Antiparkinsonism medicines

1	Benzhexol HCl	tablet, 5 mg	DEA
2	Bromocriptine	tablet, 2.5. mg	CEB
3	Levodopa + carbidopa	tablet, 250 mg + 25 mg	CEB

10 Medicines affecting the blood

10.1 Antianaemics

1	Ferrous sulphate + Folic acid	tablet, 200 mg + 0.5 mg	HVA
2	Ferrous sulphate	mixt, paediatric, 60 mg/5 mL	HEA
3	Folic acid	tablet, 5 mg	HEA
4	Iron sorbitol	injection, 5% (50 mg/mL) 2 mL amp	DVB
5	Hydroxocobalamin	inj, 1 mg/mL, 1 mL amp	CVB

10.2 Medicines affecting coagulation

1	Phytomenadione	injection, 1 mg/0.5 mL amp	DVA
2	Phytomenadione	inj, 10mg/mL 1mL amp	CEA
3	Warfarin sodium	tablet, 1 mg	CVB
4	Heparin sodium	inj, 5,000, IU/mL, 5 mL vial	CEB
5	Protamine sulphate	inj, 10 mg/mL, 5 mL amp	CEB

10.2 Medicines to treat hyperkalaemia

1	Potassium binding resin (sodium polystyrene sulfonate	powder	DVA

Kayexalate®)

11. Blood products and plasma substitutes

1	Gelatin (as polygeline)	i/v infusion, 500 mL pack (Haemaccel ®)	DVA

12 Cardiovascular medicines

12.1 Antianginal drugs

1	Prapranolol HCl	tablet, 40 mg	DVA
2	Glceryl trinitrate	tablet, 500 micrograms	DEB
3*	Isosorbide dinitrate	tablet, 10 mg	DEB
4	Nifedipine	capsule, 10 mg	CVB
5	Nifedipine	tablet, slow-release, 20 mg	CEB

12.2 Antidysrhythmic medicines

1	Propranolol HCl	tablet, 40 mg	DVA
2	Lignocaine HCl	inj, 1%, 25 mL vial	CEB

12.3 Antihypertensives

1	Hydralazine HCl	injection, 20 mg amp PFR	DVA
2	Prapranolol HCl	tablet, 40 mg	DVA
3	Reserpine	tablet, 250 micrograms	DVA
4	Hydralazine HCl	tablet, 25 mg	DEA
5	Methyldopa	tablet, 250 mg	DEA
6	Reserpine	inj, 1 mg/mL, 1 mL amp	DEA
7	Captopril	tablet, 12.5 mg	CVB
8	Nifedipine	capsule, 10 mg	CVB
9	Nifedipine	tablet, slow-release, 20 mg	CEB
10	Prazosin	tablet, 1 mg	CEB
11	Enalapril	tablet, 2.5 mg	DVA
12	Amlodipine	tablet, 5mg	DEA
13	Atenolol	tablet, 50mg or 100mg	DVA

12.4 Antihypotensive medicines

1	Ephedrine sulphate	inj, 30 mg/mL, 1mL amp	DVA
2	Dopamine HCl	inj, 40 mg/mL, 5 mL amp	CVB
3	Methoxamine HCl	inj, 20 mg/mL, 1 mL amp	CEB

12.5 Cardiac glycosides

1	Digoxin	tablet, 250 micrograms	DVA
2	Digoxin	inj, 250 micrograms/mL 2 mL amp	DVA
3	Digoxin	tab, paed, 62.5 micrograms	DVA
4	Digoxin	elixir, 50 micrograms/mL	DVA

13 Dermatological medicines

13.1 Antifungals (topical)

1	Benzoic acid + Salicylic acid	ointment, 6% + 3%, 500 g	HEA
2*	Clotrimazole (or equivalent alternative)	cream, 1%, 20g	DEA
3	Sodium thiosulphate	lotion, aq., 10%, 500 mL	DEA

13.2 Anti-infectives and cleansing agents

1	Calamine lotion + Sulphur 2%	lotion, aqueous, 500 mL	HEA
2	Gentian violet	paint, aq., 0.5%, 500 ml	HEA
3	Potassium permanganate Solution	3%, 500 mL (for dilution)	HEA HEA
4	Salicylic acid + Sulphur	ointment, 5% + 5%, 500g (in YSP base)	HEA
5	Iodine	solution, weak, 500 mL	DEA
6	Zinc ointment + Sulphur 5%	ointment, 500 g	DEA
7	Zinc paste compound + Sulphur 5%	paste, 500 g	DEA
8	Hydrogen peroxide	solution, 20 volume, 500 mL	DEB
9	Salicylic acid + Sulphur	ointment, 5% + 5%, 500 g (In EO base)	CEB
10	Silver sulphadiazine	cream, 1%, 500 g	CEB
11	Brilliant green	paint, 0.1%, 500 mL	CEB

13.3 Anti-inflammatories and antipruritics

1	Calamine lotion + Sulphur 2%	lotion, aqueous, 500 mL	HEA
2	Hydrocortisone	ointment, 1%, 15 g	DEA
3	Betamethasone (as valerate)	ointment, 0.15, 15 g	CEB

4	Calamine	lotion, aqueous, 500 mL	CEB

13.4 Keratoplastics and keratolytics

1	Podophyllum resin	paint, alcoholic, 15%, 20 mL (compound benzoin tincture)	DEA
2*	Benzoyl peroxide	gel, 5%, 30 g	DEA
3	Salicylic acid	lotion, 5%, 500 mL (in alcohol 70%)	DEA
4	Salicylic acid	ointment, 5%, 500 g (in YSP base)	DEA
5	Salicylic acid 2% + Coal tar solution 15% + Sulphur 2%	shampoo, 500 mL (in soap spirit base)	DEA
6*	Salicylic acid	collodion, 12%	DEA
7	Coal tar	crude coal tar, 500 g	CEB
8	Dithranol 0.5% in zinc + Salicylic acid paste	paste, 500g	CEB
9	Salicylic acid (crude coal tar 5%	ointment, 500 g (in YSP base)	CEB
10	Zinc paste compound + Crude coal tar 5%	paste, 500 g	CEB

13.5 Scabicides and pediculocides

1	Benzyl benzoate	application, 25%, 500 mL	HEA
2	Lindane	cream/lotion 1%	CEB

13.6 Other topical preparations

1.	Emulsifying ointment	ointment, 500 g	HEA
2*	Ethyl Chloride	spray	HEA
3	Zinc oxide (in EO base0	ointment, 15%, 500 g	HEA
4*	Silver nitrate	stick (pencil) toughened	DEA
5	Yellow soft paraffin	ointment	DEA

14. Diagnostic agents

14.1 Ophthalmic diagnostic agents

1	Fluorescein sodium	eye drops, 1% (Minims)	DEA

14.2 Radiocontrast media

1	Barium sulphate	oral powder for suspension, 98%, 340 g pack	DEA
2	Barium sulphate	oesophageal cream, 70%, 800 g tube	DEA
3	**Barium sulphate**	**enema**	**DEA**
4	Sodium diatrizoate + Meglumine diatrizoate	injection, 10% + 66% 20 mL amp	DEB
5	Barrium sulphate	disponsable enema, 93%, 400 g pack	CEB
6	**Effervescent agent (carbex)**	**granules, 25 g sachet**	**CEB**
7	**Effervescent agent (carbex)**	**solutions**	**CEB**
8	Lopanoic acid	tablet, 500 mg	CEB
9	lopamidol	injection, 6.12 g/10 mL amp	CEB
10	Meglumine iothalamate	injection, 60%, 50 mL bottle	CEB
11	Meglumine ioglycamate	i/v infusion, 17%, 100mL vial	CEB
12	Propyliodone	susp, aq, 50%, 20 mL vial	CEB
13	Sodium diatrizoate + Meglumine diatrizoate	solution, aq. Hypertonic, oral/rectal, 10% +66%, 100 mL	CEB
14	Sodium iothalamate	injection, 70%, 20 mL amp	CEB
15	Magnevist (gadopentetate dimeglumine)		
16	Gadolinium		
17	Mei optonix screen cleaner		
18	Ultravist370/300 mg/ml		
19	Xenetix 300		
20	X-prep (bowel Evacuant)		

14.3 Test substances

1	*Albustix* ® (for protein in urine)	reagent strip, 50 strips	HVA
2	*Clinistix* ® (for glucose in urine)	reagent strip, 50 strips	HVA
3	*Ketostix* ® (for ketones in urine)	reagent strip, 50 strips	HVA
4	Blood group test serum (Anti-A)	dropper bottle 5 mL	DVA
5	Blood group test serum (Anti-B)	dropper bottle 5 mL	DVA
6	Blood group test serum (Anti-AB)	dropper bottle 5 mL	DVA
7	Blood group test serum (Anti-D) (Rho)	dropper bottle 5 mL	DVA

8	*Glucostx* ® (for blood glucose)	reagent strip, 50 strips	HVA
9	VDRL carbon antigen (VD 24, 25)	test reagent, 50 mL bottle	DEA
10	Pregnacy test	latex slide test kit	DEA
11	Bovine albumin	soln, dropper bottle, 5 mL	CVB

15 Disinfectants

1	Cetrimide + chlorhexidine	solution, 15% + 1.5% (For dilution)	HVA
2	Black disinfectant	solution 9for dilution)	HVA
3	Glutaraldehyde	solution, buffered, 2%	DEA

16. Diuretics

1	Hydrochlorothiazide Or Bendrofluazide	tablet, 25 mg tablet, 5 mg	DVA
2	Frusemide	tablet, 40 mg	DVA
3	Frusemide	inj, 10 mg/mL, 2 mL amp	DVA
4	Mannitol	inj, 20%, 250 mL bottle	DEA
5	Spironolactone	tablet, 25 mg	DEA

17. Gastrointestinal medicines

17.1 Antacids and other antiulcers medicines

1	Magnesium trisilicate co	tablet, chewable	HEA
2	Cimetidine	tablet, 400 mg	CVB
3	Ranitidine	tablet, 150 mg	CEB
4	Bismuth chelate (tripotassium dictratobismuthate)	liquid, 120 mg/5 mL, 560 mL	CEB
5	Omeprazole	tablet, 10mg	DVA

17.2 Antiemetics

1	Metoclopramide HCl	inj, 5 mg/mL, 2 mL amp	DEA
2	Promethazine HCl	tablet, 25 mg	DEA
3	Promethazine HCl	elixir, 5 mg/5 mL	DEA
4	Promethazine HCl	inj, 25 mg/mL, 2 mL amp	DEA

17.3 Antihaemorrhoidals

1	Bismuth subgallate co.	suppository	DEA

17.4 Antispasmodics

1	Atropine sulphate	inj, 600 micrograms/mL 1 mL amp	DVA
2	Hyoscine butylbromide	inj, 20 mg/mL, 1mL amp	DEA
3	Propantheline bromide	tablet, 15 mg	DEA

17.5 Cathartics

1	Bisacodyl	tablet, 5 mg	DEA
2	Glycerol	suppository (child) 2 g	DEA
3	Magnesium sulphate	enema, 50%, 130 mL	DEB

17.6 Medicines used in diarrhoea

17.6.1 Oral rehydration preparations

1	Oral rehydration salts (ORS)	low osmolarity powder in sachet for 1 litre (WHO citrate formula)	HVA
2	ReSoMal	powder for 1 litre	DVA

17.6.2 Medicines for diarrhoea in children

1	Zinc	tablets, 20mg	HVA

17.6.2 Antimotility drugs

1	Codeine phosphate	tablet, 15 mg	DEA
2*	Loperamide HCl	tablet, 2 mg	DEA

18. Hormones and other endocrine medicines

18.1 Adrenal hormones and synthetic substitutes

1	Hydrocortisone	inj, i/v, 50 mg/mL, 2 mL amp (as sodium succinate)	DVA
2	Prednisolone	tablet, 5 mg	DVA
3	Dexamethasone	inj, 5 mg/mL, 5mL vial (as sodium phosphate)	DVA
4	Dexamethasone	tablet, 500 micrograms	DEA

5	Hydrocortisone acetate	tablet, 20 mg	CVB
6	Hydrocortisone acetate (i/m or intra-articular)	injection, aqueous susp, 25 mg/mL, 5 mL vial	CVB
7	Fludrocortisone acetate	tablet, 100 mircograms	CVB
8	Bromocriptine	tablet, 2.5 mg	CEB

18.2 Oestrogens

1	Oestrogens, conjugated	tablet, 625 micrograms	CEB

18.3 Insulins and other antidiabetic medicines

1	Glibenclamide	tablet, 5 mg	DVA
2	Insulin, soluble (Human Actrapid ®)	injection, 100 units/mL 10 mL vial	DVA
3	Insulin zinc suspension (Human Monotard ®)	injection, 100 units/mL 10 mL vial	DVA
4	Metformin HCl	tablet, 500 mg	DVA

18.4 Contraceptives

18.4.1. Hormonal contraceptives

1	Norgestrel + ethinyl estradiol Combined, low-oestrogen	tablet, 0.3mg + 0.03mg	HVA
2	Medroxyprogesterone acetate	inj, aqueous suspension, 150 mg/mL, 10 mL vial	HVA
3	Norgestrel Progestogen – only	tablet, 0.75mg	HVA
4	Levonorgestrel	surgical implant, 75mg	DVA
5	Levonorgestrel	tablets, 750 micreograms	DEB

18.4.2 Intra-uterine devices (IUD)

1	Copper containing IUD	wire, 176mg	DVB

18.4.3 Barrier contraceptives

1	Condom with spermicide	(nonoxinol)	HVA

18.5 Ovulation inducers

1	Clomiphene citrate	tablet, 50 mg	CEB

18.6 Progestogens

1	Norethisterone	tablet, 5 mg	DEA

18.7 Thyroid hormones and antithyroid agents

1	Iodine	aqueous soln, oral, 30 mL (ligol's iodine)	DEA
2	Carbimazole	tablet, 5 mg	CVA
3	Thyroxine sodium	tablet, 100 micrograms	CVA

19. Immunologicals

19.1 Immunological diagnostic agents

1	Tuberculin purified Protein derivative (PPD)	injection solution 1 mL amp/vial	DVA

19.2 Sera and immunoglobulins

1	Anti D (RH_o) Immunoglobulin (Human)	inj, 250 micrograms/mL, 1 mL amp	DVA
2	Antirabies serum	injection, 1,000 IU/5 mL vial	DVA
3	Diphtheria antitoxin	injection, 20,000 IU/vial	DVA
4	Tetanus antitoxin	injection, 20,000 IU/vial	DVA
5	Tetanus antitoxin	injection, 1,500 IU/vial	DVA
6	Gas-gangrene antitoxin Mixed	injection, 25,000 IU/vial	DEB

19.3 Vaccines

19.3.1 Vaccines for universal immunisation

1	BCG vaccine	injection, 20 dose vial PFR	HVA
2	Diphtheria-pertissis-tetanus (DPT) vaccine (adsorbed)	inj, 20-dose (10 mL) vial (triple vaccine)	HVA
3	Measles vaccine, live	inj, 10-dose (5mL) vial PFR	HVA
4	Poliomyelitis vaccine live	oral suspension, 20-dose dispenser	HVA
5	Tetanus vaccine	injection, 10 mL vial	HVA
6	Pentavalent vaccine (diphtheria, tetanus, pertussis Hepatitis B, heamophilus Influenza)	injection, 2 dose vial	HVA

19.3.2 Vaccines for specific individuals

1	Rabies vaccine	inj, 1-dose (0.5 mL) vial (PFR + diluent amp)	DVA
2	Yellow fever vaccine	inj, 10-dose (5 mL) vial (PFR + diluent amp)	CEB

20 Muscle relaxants (peripherally acting) and cholinesterase inhibitors

1	Suxamethonum chloride	inj, 50 mg/mL, 2 mL amp	DVA
2	Edrophonium chloride	inj, 10 mg/mL, 1 mL amp	CVB
3	Alcuronium chloride	inj, 5 mg/mL, 2mL amp	CEB
4	Neostigmine methylsulphate	inj, 2.5 mg/mL, 1 mL	CEB
5	Vecuronium bromide	injection, 10 mg vial PFR	CEB

21. Ophthalmological preparations

2.1. Anti-infectives

1	Tetracycline HCl	eye oint, 1%, 3.5 g tube	HVA
2	Chloramphenicol	eye oint, 1%, 3.5 g tube	DVA
3	Gentamicin (as sulphate)	eye drops, 0.3%, 5 mL	DVA
4	Chloramphenicol	eye drops, 0.5%, 5 mL	CEB
5	Idoxuridine	eye drops, 0.1%, 5 mL	CEB
6	Miconazole	eye drops, 1%, 10 mL	CEB

21.2 Anti-inflammatories

1	Dexamethasone	eye drops, 0.1%, 5 mL	CVA
2	Methylprednisolone acetate Acetate	inj, 40 mg/mL, 2 mL vial (for sub-conjunctival)	CEB

21.3 Local anaesthetics

1	Amethocaine HCl	eye drops, 1%, 10 mL	DEA

21.4 Miotics and antiglaucoma drugs

1	Acetazolamide	tablet, 250 mg	DVA
2	Pilocarpine HCl	eye drops, 1%, 10 mL	CVA
3	Timolol maleate	eye drops, 0.25% 5 mL metered dose unit	CVA

4	Acetazolamide	injection, 500 mg vial PFR	CEB
5	Glycerol	oral solution, 50%	CEB

21.5 Mydriatics and cycloplegis

1	Atropine sulphate	eye oint, 1%, 3.5 g tube	DVA
2	Cyclopentolate HCl	eye drops, 0.5%, 5 mL	DEA
3	Tropicamide	eye drops, 0.5%, 5 mL	CEB

21.6 Diagnostic agents

1	Fluorescein sodium	eye drops, 1%, 5ml	DEA

22 Obstetric medicines

22.1 Oxytocics

1*	Ergometrine maleate + Oxytocin (syntometrine ®)	inj, 500 micrograms +	HVA
2	Oxytocin	inj, 10 IU/mL, 1 mL amp	DVA
3	Dinoprostone	vag, gel, 200 micrograms/mL 2.5. mL (500 micrograms)	CVB
4	Dinoprostone	vaginal tablet, 3 mg	CEB

22.2 Myometrial relaxants

1	Salbutamol sulphate	tablet, 4 mg	HVA
2	Salbutamol sulphate	inj, 1 mg/mL, 5 mL amp	DVA

22.3 Medicines used in severe PIH and eclampsia

1*	Magnesium sulphate	inj, 500 mg/mL, 2 mL amp	DVA

22.3 Medicines used in primary PPH

1	Misoprostol	tablet, 200micrograms	DVA

23 Peritoneal dialysis solutions

1	Dianeal + dextrose	1.5% intraperitoneal dialysis Soln, 1 L bottle	CVB
2	Dianeal + dextrose	4.25% intraperitoneal dialysis	CVB

		Soln, 1 L bottle	

24	**Psychotherapeutic medicines**		
1	Chlorpromazine HCl	inj, 25 mg/mL, 2 mL amp	HEA
2	Chlorpromazine HCl	tablet, 25 mg	HEA
3	Amitriptyline HCl	tablet , 25 mg	DVA
4	Amitriptyline HCl	injection, 10 mg/mL	CEB
5	Chlorpromazine HCl	tablet, 100 mg	DVA
6	Diazepam	inj, 5 mg/mL, 2 mL amp	DVA
7	Fluphenazine decanoate	inj, oily, 25 mg/mL 2 mL amp	DVA
8	Diazepam	tablet,5 mg	DEA
9	Chlormethiazole	capsule, 192 mg base	DEA
10	Haloperidol	tablet, 1.5 mg	DEA
11	Haloperidol	tablet, 1.5 mg	DEA
12*	Carbamazepine	tablet, 200 mg	DEB
13*	Haloperidol decanoate	inj, oil, 50 mg/mL, 1 mL amp	CEB
14*	Pericyazine	tablet, 4 mg	CEB
15*	Procyclidine HCl	tablet, 5mg	CEB
16*	Procyclidine HCl	inj, 5 mg/mL, 2 mL amp	CEB
17*	Promazine	tablet, 25 mg	CEB
18*	Thioridazine	tablet, 100 mg	CEB
19	Fluoxetine	tablet, 20mg	CVA
20	Imipramine	tablet, 10mg	CVB

25.	**Respiratory system medicines**		
25.1	**Antiasthmatics**		
1	Adrenaline	inj, 1/1,000, 1 mL amp	HVA
2	Aminophyline	inj, 25 mg/mL, 10 mL amp	HVA
3	Salbutamol sulphate	tablet, 4 mg	HVA
4	Aminophylline	tablet, 100 mg	HVA
5	Salbutamol Sulphate	inj, 1 mg/mL, 5 mL amp	DVA
6	Salbutamol Sulphate	aerosol inhalation 100 micrograms/dose, 200 – dose unit	DVA
7	Salbutamol Sulphate	respirator solution, 1 mg/mL Single dose nebuliser amps	DVA
8	Beclomethasone Diproprionate	aerosol inhalation, 50 micrograms/dose, 200-dose unit	CVB
9	Sodium cromoglycate	spincap, 20 mg (for use with an insufflator)	CEB

26. Replacement fluids and electrolytes

26.1 Oral preparations

1.	Oral rehydration salts, (ORS)	powder in sachet for I L (WHO low osmolarity)	HVA
2	potassium chloride	tablet, slow release, 600 mg	DVA

26.2 Parenteral preparations

1	Glucose (dextrose)	injection, 50%, 20 mL amp	HVA
2	Sodium lactate comp (Ringer-lactate or Hartmann's solution)	i/v infusion, 1L pack	HVA
3	Water for injections	for i/v use, 10 mL amp	HVA
4	Glucose (dextrose)	i/v infusion, 5%, 1L pack	DVA
5	Glucose (dextrose)	i/v infusion, 10%, 100 L pack	DVA
6	Potassium chloride	injection, 20%, 10 mL amp	DVA
7	Sodium bicarbornate	injection, 4%, 50 mL vial	DVA
8	Sodium chloride	i/v infusion, 0.9%, 1L pack	DVA
9	Sodium lactate + glucose (Darrow's ½ strength in dextrose 5%	i/v infusion, 1L (adult) pack	DVA
10	Sodium lactate + glucose	i/v infusion, 200 mL (paed)	DVA

27 Vitamins and minerals

1	Vitamin A	capsule, 200,000 IU (liquid or gel filled)	HVA
2	Vitamin B Co. strong	tablet	HEA
3	Nicotinamide	tablet, 50 mg	DEA
4	Pyridoxine HCl	tablet, 20 mg	DEA
5	Thiamine	inj, 100mg/ml	DEB
6	Vitamins, multiple	syrup	DEA
7	Vitamins, multiple	tablet	DEA
8	Calcium gluconate	tablet, chewable, 500 mg	DEB
9	Vitamins, multiple	injection, i/v, high-potency 10 mL (in 2 amps)	DEB
10	Calciferol, high-strength	tablet, 10,000 IU	CVB
11	Calcium gluconate	injection, 10%, 10 mL, amp	CEA

28. Preparations for the ear and oropharynx

28.1 Preparations for the ear

1	Gentian violet	paint, aq., 0.5%, 500 mL	HEA
2	Sodium bicarbonate	ear drops, 5%, 25 mL	DEA
3	Betamethasone Sodium phosphate (or equivalent)	ear drops, 0.1%, 10 mL	DEB
4	Acetic acid	ear drops, 2%	HEB

28.2 Preparations for the oropharynx

1	Gentian violet	paint, aq., 0.5%, 500 mL	HEA
2	Nystatin	oral suspension, 100,000 IU/mL, 20 mL (with graduated dropper)	DEA

29. Medicines used for gout

1	Allopurinol	tablet, 100 mg	DEA
2	Colchicine	tablet, 500 micrograms	DVB

30. Laxatives

1	Lactulose	solution, 3.1mg/5ml	CVA
2	Liquid paraffin	solution	HVA