



Government of Malawi

# Malawi Standard Treatment Guidelines (MSTG) 5<sup>th</sup> Edition 2015

Incorporating Malawi Essential  
Medicines List (MEML) 2015

Ministry of Health



# **Malawi Standard Treatment Guidelines (MSTG)**

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**Incorporating Malawi Essential  
Medicines List (MEML) 2015**

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**Ministry of Health**

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## Foreword

The purpose of the **Malawi Standard Treatment Guidelines (MSTGs)**, which incorporates the **Malawi Essential Medicines List (MEML)** is to standardise prescribing patterns and practices, thereby also enabling a more consistent and uniform range of available medicines and medical supplies across all levels of the national health care system. This in turn helps in quantification, procurement and supply of national requirements of medicines and medical supplies.

The **5<sup>th</sup> Edition of the MSTGs** which has new added chapters in fields such as oncology has, therefore, been developed to meet the needs of prescribers at different levels, in selecting and prescribing the right medicines, realising that “memory alone can sometimes be treacherous” and even the most thoroughly informed prescribers need a reminder “to make them masters of the situation”.

It must be mentioned though that medicine is a very complex and dynamic field with emerging and re-emerging clinical conditions, hence as is always the case in clinical practice, professional knowledge and judgement is of paramount importance, and where necessary, this should be supplemented by specialised publications on specific clinical conditions as well as reference to relevant product literature.

It is the wish of the Ministry of Health that prescribers both in public and private health sector will make the most use of this **5<sup>th</sup> Edition of the Malawi Standard Treatment Guidelines** in their time of duty.

A handwritten signature in black ink, appearing to read 'C.V. Kang'ombe', with a large, stylized loop at the beginning.

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 Malawi*, J A Phillips, P N Kazembe, EAS Nelson, JAF Fisher, E Grabosch, 2<sup>nd</sup> ed. 1998)
- *Common Medical Problems in Malawi*, P A Reeve (ed. J J Wirima)
- *Management of Sexually Transmitted Infections Using Syndromic Management Approach, Guidelines for Service Delivery 2<sup>nd</sup> Edition, Ministry of Health/NAC, Vol 3, 2004 Malawi;*
- *Guidelines for the Use of Antiretroviral Therapy in Malawi*, MoH, 2<sup>nd</sup> Edition, 2008.
- *Malawi National TB Control Programme Manual, 7<sup>th</sup> Edition, 2012*
- *A Guide for Community Based Care for Drug Resistant TB*, Ministry of Health,
- *Infection Prevention Standards*, MoH, 2006
- *Guide for the Management of Malaria*, MoH National Malaria Control Programme, 2007
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- *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
- *National IMCI Chart Booklet*, MoH IMCI Unit, 2007,
- *Prevention of Mother to Child Transmission of HIV*, Handbook for Health workers, MoH, 2003
- *MoH Management of HIV/AIDS Related Diseases (2008 2<sup>nd</sup> Edition)*

## **Acknowledgements**

The Ministry of Health wishes to extend its sincere thanks and appreciation to all those who dedicated their time and effort in producing this **5<sup>th</sup> Edition of the Malawi Standard Treatment Guidelines (MSTGs)**, which for convenience sake incorporates the **Malawi Essential Medicines List (MEML)**. The core list of those who contributed either through physical attendance in workshops or through email correspondence is shown on the next page. Special mention should be made of the role played by the Directorate of Clinical Services, led by Dr. George Chithope-Mwale, in coordinating the review process, in collaboration with the Deputy Director of Health Technical Support Services (HTSS) responsible for Pharmaceuticals, Mr. Albert Khuwi, with exclusive funding support from Clinton Health Access Initiative (CHAI) under the leadership of Mr. Christopher Connolly, who also provided valuable technical input. The editorial team, co-led by Dr. A. Chitsa Banda, Clinical Consultant in Internal Medicine (Malawi Defence Force) and Mr. E. Phale, the Assistant Director of Clinical Services, is also being recognised for the marvellous work in formatting, editing and producing the final version of the document.

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## **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 practice 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
  - 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

## *Prescribing guidelines*

- 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

## *Prescribing guidelines*

- 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.

*Prescribing guidelines*

- 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:

**List of Abbreviations**

a.c	before meal
b.d	twice a day
IM	Intramuscular
IV	Intravenous
mane	in the morning
n et m or n.m.	night and morning
nocte	at night
o.m.	every morning
o.n.	every night
p.o.	by mouth
p.c.	after meals
prn	when necessary
q4h	every 4 hours
q6h	every 6 hours
q8h	every 8 hours
q.i.d	4 times a day
stat	immediately or at once
sig	label
t.d.s.	3 times a day

## *Prescribing guidelines*

- 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

## *Prescribing guidelines*

- 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**

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

\* 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 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: 01755 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.

### *Prescribing guidelines*

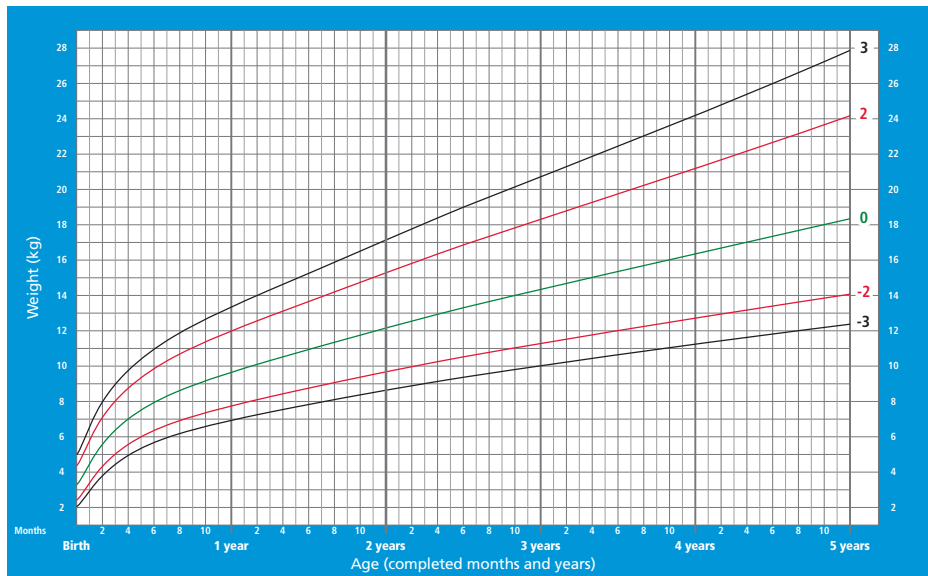
The main reason for this is that children of the same age may vary significantly in weight.

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

8.2 The following graphs shows weights of children aged 0 to 5 years and may be used to determine whether the child is well nourished, underweight as well as overweight for their specific ages.

### Weight-for-age BOYS

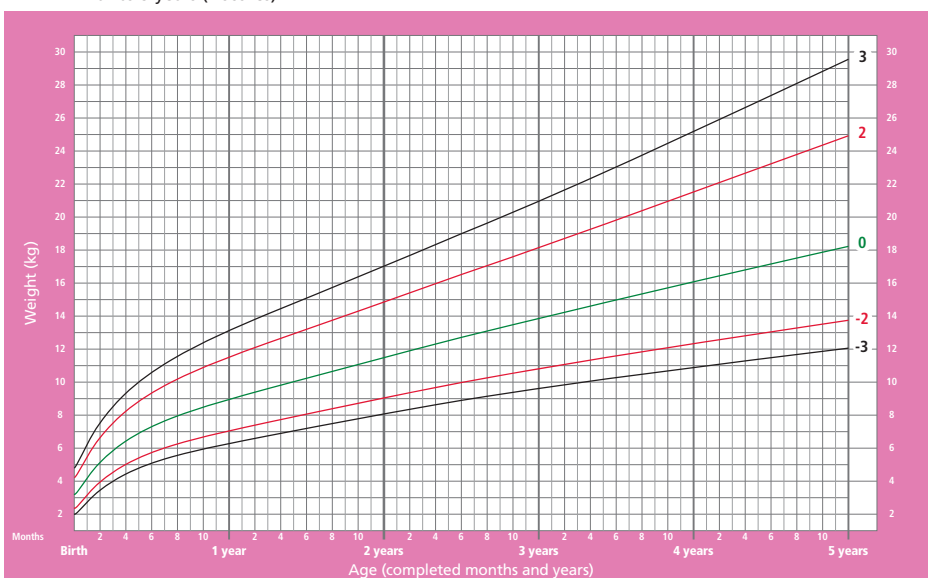
Birth to 5 years (z-scores)



WHO Child Growth Standards

### Weight-for-age GIRLS

Birth to 5 years (z-scores)



WHO Child Growth Standards

Five lines are shown on each graph

- The middle green line shows weight for average children with a z score of zero
- The lower red line shows weights for children who are moderately underweight for their age with a z score of -2
- The lower black line shows weights for children who are severely underweight for their age with a z score of -3
- The upper red line shows weights for children who are moderately overweight for their age with a z score of +2
- The upper black line shows weights for children who are severely overweight for their age with a z score of +3

8.3 When a weighing scale is not available the following equation can be used to estimate the weight of the child:  $[\text{Age (in years)} + 4] \times 2$

8.4 Neonates have delayed hepatic and renal excretion of medicines and also unpredictable absorption of oral medication. 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, page 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 Essential Medicine List, 2014. 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. 2<sup>nd</sup> line) medicines may be used when a satisfactory response has not been obtained with the recommended (1<sup>st</sup> line) medication.

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## **Abbreviations**

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ARI	Acute Respiratory Infections
ART	Anti-Retroviral Therapy
BF	Blood Film examination
BP	Blood Pressure
COC	Combined Oral Contraceptive
CSF	Cerebrospinal Fluid
CVA	Cerebrovascular Accident
CPAP	Continuous Positive Airway Pressure
CXR	Chest X-ray
DIC	Disseminated Intravascular coagulopathy
DNS	Dextrose Normal Saline
FBC	Full blood count
FFP	Fresh Frozen Plasma
g	gram
Hb	haemoglobin
HIV	Human immunodeficiency Virus
IM	Intramuscular
IV	Intravenous
IU	International units
JVP	Jugular 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

## *Abbreviations*

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

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## **Metric Units**

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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

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## 1.0 Blood and Haematological Conditions

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### 1.1 Blood: Guidelines for Appropriate Use

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Refer to the Ministry of Health Guidelines for Safe Blood Transfusion for further details on:

- Donor recruitment and selection,
- Blood collection,
- Storage procedures and records,
- Laboratory testing of donor and recipient's blood
- Refer to Guidelines for the Clinical Use of Blood and Blood Products in Malawi for Clinical aspects of blood transfusions and administration Transfusion reactions
- 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

## *1. Blood and haematological conditions*

- The decision to transfuse blood has been based on careful assessment of the patient which must indicate 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 blood donors and/or appropriately screened for infectious agents.
- Ensure that compatibility testing is carried out on **all** blood to be transfused. In absolute emergencies, where there is no time for emergency cross-matching, uncross-matched blood can be issued but a cross-match should still be done while the transfusion is in progress.
- Observations of patient's vital signs should be done at the time of starting the transfusion, at 15 minutes, 1 hour, 4 hours and at 24 hours

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## **1.2 Indications for transfusion of whole blood or red cell suspension**

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### **1.2.1 Severe Anaemia**

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#### *Neonates*

- Hb < 12 g/dl (PCV < 36%) in the first 24 hours of life.
- Hb < 12 g/dl (PCV <36%) in a neonate receiving mechanical ventilation.
- Hb 8-11 g/dl (PCV 24-33%) and oxygen dependent.
- Hb < 7 g/dl (PCV < 21%) when stable and off oxygen.

#### *Children and infants*

- If Hb < 4 g/dl or PCV <12
- If Hb < 6 g/dl or PCV <18 with any of the following:
  - Shock or clinically detectable dehydration
  - Impaired consciousness
  - Respiratory acidosis (deep laboured breathing)
  - Heart Failure
  - Requiring oxygen for any reason

## *1. Blood and haematological conditions*

### *Dose*

- Transfuse 20ml/kg of whole blood or 10ml/kg of red cell suspension
  - A diuretic is usually not indicated because many of these children are usually hypovolemic with a low blood volume.
  - Check the respiratory rate and pulse rate every 15 minutes and if one of them rises, transfuse more slowly.
  - If there is evidence of fluid overload due to blood transfusion, give Frusemide (1-2mg/kg) up to a maximum total of 20mg.
  - If severe respiratory distress, consider oxygen therapy with or without CPAP as appropriate.
  - After the transfusion, if the Hb remains low, repeat the transfusion
  - In severely malnourished children fluid overload is common and difficult to recognize. Give 10mls/kg rather than 20ml/kg of whole blood once only and do not repeat the transfusion.
  - Give a daily iron-folate tablet or Iron syrup for 14 days (Iron must not be given when acutely unwell, and in rehabilitation phase of malnutrition).



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## 1.2.2 Non severe Anaemia in children

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### *Children*

Young children (less than 6 years) are anaemic if their Hb is less than 9 g/dl. Begin treatment unless the child has severe malnutrition, in which case, refer to malnutrition chapter.

- Give (home) treatment with iron (daily iron-folate tablet or dose of iron syrup) for 14 days
- Ask the parent to return with the child in 14 days. Treat for 3 months when possible, as it takes 2-4 weeks to correct anaemia and 1-3 months to build up iron stores
- If the child is  $\geq 1$  year and has not received **Mebendazole** in the previous 6 months, give one dose of **Mebendazole** (500mg) alternatively **Albendazole** (200mg or 400mg depending on age) for possible hookworm or whipworm infestation
- Advise the mother about good feeding practice

### *Pregnancy*

- Refer to Reproductive Health (Chapter 12)

## *1. Blood and haematological conditions*

### *Adults*

- If Hb less than 5 g/dl
- If Hb less than 8 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-operative Surgery*

- If Hb less than 8 g/dl

### *Red Flags*

- Do not transfuse in megaloblastic anaemia ( $MCV \geq 110$ )
- If suboptimal rise or fall in haemoglobin level after transfusion and there are signs of haemolysis (such as jaundice, raised bilirubin level), refer the patient for specialist management)

### *Vitamin B12 deficiency*

- Transfusion should be avoided unless the patient has symptomatic anaemia and even then, the minimum possible amount of blood or red cell suspension should be transfused e.g. one paediatric unit for an adult patient.

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### **1.2.3 Acute Haemorrhage with shock (see section 1.5, table 1)**

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### **1.2.4 Intra-operative use (where necessary)**

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

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## **1.3 Platelets**

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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.

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### **1.3.1 Indications for platelets use**

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- 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

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## 1.4 Fresh frozen plasma

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- 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

**Note:** *Do not use whole blood, fresh frozen plasma or red cell suspension to expand blood volume*

- Once thawed, FFP must be used immediately. FFP must never be refrozen.
- The patient needs further investigations; please refer to the central hospital.

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### 1.4.1 Indications for use of fresh frozen plasma

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- 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

## 1. Blood and haematological conditions

### *Dose*

15-20ml/kg

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

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### 1.5 Acute Haemorrhage

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- 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 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)**

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

- 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.

## 1. Blood and haematological conditions

- 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

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### 1.6 Adverse Reactions to Transfusion

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- Suspect an adverse reaction if any of the following occurs:
  - Severe pain at transfusion site or in the back, loin and/or chest
  - Rise in temperature of 1<sup>o</sup>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
- Treatment depends on the severity of the transfusion reactions.



### 1.6.1 Mild reaction

---

*Signs and symptoms:* itchy rash

*Possible cause:* hypersensitivity (mild)

***Treatment:***

- Slow the transfusion
- Administer antihistamine IM/IV or PO
- **Chlorpheniramine** 0.1 mg/kg IM or IV for children; 10mg IM/IV for adult alternatively **Chlorpheniramine** 4mg PO or
- **Promethazine** 6.25-12.5mg for children aged 5-12 yrs and 25mg for adults.
- If no clinical improvement within 30 minutes or if signs and symptoms worsen, treat as Category 2.

---

### 1.6.2 Moderate Reaction

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*Signs and Symptoms:*

- Anxiety, pruritus, palpitations, mild dyspnea, headache, rigors, fever, tachycardia

*Possible causes:*

- Hypersensitivity (moderate to severe)
- Febrile non-haemolytic transfusion reaction
- Contamination with pyrogens and / or bacteria.

**Treatment**

- Seek help immediately from the anaesthetic, emergency team or whoever is available and skilled to assist
- Stop the transfusion
- Replace the infusion set and keep IV line open with normal saline.
- Administer antihistamine IM/IV or PO
  - Chlorpheniramine 0.1 mg/kg IM or IV for children; 10mg IM/IV for adult or Chlorpheniramine 4mg PO.
  - Promethazine 6.25-12.5mg for children aged 5-12 yrs and Promethazine 25mg for adults.
- Give oral or rectal antipyretic (e.g. **Paracetamol** 10 mg/kg or 0.5g – 1g in adults). Never give **Aspirin**.

## *1. Blood and haematological conditions*

- Give IV corticosteroids (e.g. **Hydrocortisone** 200mg IV stat) and bronchodilators (e.g. **Aminophylline** 100mg stat) if there are anaphylactoid features (e.g. bronchospasm, stridor).
- If there is clinical improvement, restart transfusion slowly with new blood unit and observe carefully.
- If no clinical improvement within 15 minutes or if signs and symptoms worsen, treat as Category 3.

---

### **1.6.3 Life-threatening Reaction**

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#### *Signs and symptoms*

- Anxiety, chest pain, pain near infusion site, respiratory distress, loin or back pain, headache, dyspnea, rigors, fever, restlessness, hypotension, tachycardia, haemoglobinuria, unexplained bleeding

#### *Possible causes:*

- Acute intravascular haemolysis
- Bacterial contamination and septic shock
- Fluid overload
- Anaphylaxis
- Transfusion Associated Acute Lung Injury (TRALI)

#### **Treatment**

- Seek help immediately from the anaesthetist, emergency team or whoever is available and skilled to assist.

## *1. Blood and haematological conditions*

- Stop the transfusion. Replace the infusion set and keep IV line open with normal saline.
- Infuse normal saline (initially 20- 30 ml/kg) to maintain systolic BP, if hypotensive, give over 5 minutes and elevate patient's legs.
- Maintain airway and give high flow of oxygen by mask.
- Give **Adrenaline** (as 1:1000 solutions) 0.01 mg/kg body weight by slow intramuscular injection.
- Give IV corticosteroids (**Hydrocortisone** 200mg IV stat) and bronchodilators (aminophylline 100mg stat) if there are anaphylactoid features (e.g. bronchospasm, stridor).
- Give a diuretic: e.g. **Frusemide** 1 mg/kg IV or equivalent (if there is fluid overload)
- Assess for bleeding from puncture sites or wounds. If there is clinical or laboratory evidence of a DIC treat accordingly.
- Maintain fluid balance accurately
- If bacteraemia is suspected (rigors, fever, collapse, no evidence of a haemolytic reaction), start broad-spectrum antibiotics IV and send blood product bag to the laboratory for culture of contents.

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### **1.6.4 Alternatives to Blood Transfusion**

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- There is no fluid that has similar properties as blood which can be used instead of blood.
- **IV Iron and Erythropoietin** which can be used as substitutes to blood transfusion in chronic anaemia are currently not available in our health facilities.
- Acute anaemia due to bleeding or haemolysis cannot be adequately treated by giving these products.
- When available, cell salvage machines can be used in acute anaemia due to bleeding.

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## **1.7 Anaemia**

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### **1.7.1 Sickle Cell Anaemia**

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Wide spectrum of disease severity

- Suspect if patient is chronically anaemic and/or received previous blood transfusions and also those with family history of siblings/relatives with multiple blood transfusions
- Suspect in children who have suffered from one or more of the presentations listed below. For sickle cell test, refer for further investigations and management

## Sickle cell Disease presentations

Presentation	Age	Management	Differential
Hand foot syndrome- hand foot swelling early infancy	0.5 – 2 yr	Analgesics and hydration	Septic arthritis
Stroke/ CNS complications	5- 10yr	CT/MRI scan, treat seizures	Cerebral malaria/ abscess
Bone Infarct	0.5- 10yr	Xray, analgesia, rest, ortho referral	Osteomyelitis
Splenic sequestration	<3yr	O2, treat shock, Benzylpenicillin, Gentamycin, transfuse	Acute abdomen
Acute Chest	0.5- 10yr	O2, Antibiotics, Xray	Pneumonia
Bowel infarct/Abdominal crisis		O2, antibiotics, surgical rv	Acute abdomen/ cholelithiasis
Priapism- sudden painful onset of penis that fails to relax	6- 20yrs	Surgical assessment if not relaxing for more than 4 hours	
Kidney infarct		Urinary output, electrolytes and BP	Nephritic syndrome
Skin Ulcers	>10yrs	GV paint/ antibiotics ointments/ analgesics	Kwashiorkor
Eye disorders	>10yrs	Ophthalmologist review	Other causes of low vision

## **Treatment**

*For severe anaemia, refer to section 1.2.1*

- If shocked, consider splenic sequestration (20ml/kg normal saline – see shock protocol)
- Transfuse in acute chest syndrome or stroke
  - Consider BTF program/  
**Hydroxyurea** 15mg/kg daily then increase by 5mg/kg every 12<sup>th</sup> week to max 35mg/kg daily

*For painful and vasoocclusive crises*

- All children presenting with sickle cell crises should be started on oxygen even if saturations are normal
- Per every 24hrs, give 1.5 times maintenance fluid IV
- Encourage lots of oral hydration
- Give analgesics (see palliative care section)

*For Infection and fever*

- Sepsis usually caused by S pneumonia, give **Benzympenicillin** and **Gentamicin**
- Meningitis usually caused by S pneumonia, give **Ceftriaxone** for 2 weeks
- Acute Chest syndrome, give **Ceftriaxone** and **Erythromycin**
- Salmonella osteomyelitis: Ceftriaxone IV (2-6 weeks), then oral **Ciprofloxacin**

## *1. Blood and haematological conditions*

- Always check for malaria parasites

### *Others*

- Cholelithiasis/Cholecystitis (>10yrs) AXR, needs abdominal ultrasound and surgical referral

### *Discharge and follow up*

- Ensure being followed up in hospital clinic for the following:
  - Malaria prophylaxis
  - Monthly **Sulphadoxinepyrimethamine (SP)**
    - <4yrs ½ tab
    - 4-8yrs 1 tab
    - 9-14yrs 2tab
    - >14yrs 3tab
- Alternatively use weekly **Chloroquine** 5mg/kg
- Folic acid 1-5mg daily
- **Benzathine Penicillin** (>6months) monthly IM
  - <30KG: 600000IU
  - >30KG: 1.2MU
- Pneumococcal vaccine (2 and 5yrs) if available
- Consider **Hydroxyurea** for those with frequent painful crises
- **DO NOT GIVE FERROUS SULPHATE**



## *1. Blood and haematological conditions*

- Educate patient and family to ensure early analgesics, and to promptly seek medical attention if
  - severe pain
  - fast breathing
  - looking much more pale than usual
  - high temperature
  - vomiting and diarrhoea

---

### **1.7.2 Anaemia, Aplastic**

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- There is pancytopenia due to a hypoplastic bone marrow.

#### *Signs and Symptoms*

- Pallor, petechiae, purpura, and bleeding with frequent or severe infections.

#### *Treatment*

- If neutropenic and febrile.
- Stabilise patient, if necessary, with blood products before referral.
- Refer patient

### *Referral*

- Discuss all cases of suspected aplastic anaemia with a haematologist/specialist. Stabilise patient, if necessary, with blood products before referral.

**Note:** Discuss all cases of suspected aplastic anaemia with a haematologist/specialist.

---

### **1.7.3 Anaemia, Chronic Disorder**

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- Anaemia due to chronic inflammation.
- This is characteristically a normochromic normocytic anaemia.
- Common causes of anaemia of chronic disorder include: malignancy, e.g. haematological or solid tumours, autoimmune disorders, e.g. rheumatoid arthritis, acute or chronic infections, e.g. HIV and TB, chronic kidney disease, and chronic rejection of solid-organ transplantation, etc.

### *Treatment*

- Treat the underlying condition.
- Transfusion is seldom necessary.
- Do not treat with iron, folic acid or vitamin B12 unless there is a documented deficiency.

### **1.7.4 Anaemia, Haemolytic**

---

#### *Causes*

- Anaemia due to destruction of red blood cells. Destruction may be due to:
- Extracellular factors such as auto-immunity or mechanical factors, e.g. disseminated intravascular coagulation (DIC), hypersplenism, medications.
- Abnormalities of the cell membrane, e.g. hereditary spherocytosis.
- Enzymes, e.g. G6PD deficiency.
- Haemoglobin, e.g. sickle cell anaemia, thalassaemia.

#### *Investigations*

- Evidence of haemolysis: anaemia, reticulocytosis, decreased haptoglobin, increased lactate dehydrogenase (LDH) and unconjugated hyperbilirubinaemia.
- Coombs' test (direct antiglobulin) is usually positive with autoimmune haemolysis.

#### *General Measures*

- Treat the underlying cause.
- Do not transfuse prior to appropriate investigations, unless anaemia is severe.
- Coombs-positive haemolytic anaemia may be technically difficult to cross match.

## *1. Blood and haematological conditions*

- In G6PD deficiency, avoid drugs known to cause haemolysis, including **Aspirin**, sulphonamides (including **Cotrimoxazole**), dapson and primaquine. In patients with cold agglutinins all transfusions must be given through a blood warmer to avoid cold-induced haemolysis.

**Note:** *Efficacy of transfusion is limited by the shortened red cell survival due to haemolysis.*

### *Treatment*

- Supplement with Folic acid, oral, 5 mg daily given to all patients (because of high red cell turnover)

**Note:** *For Autoimmune haemolytic anaemia, give **Prednisolone**, oral, 1–2 mg/kg daily, initial dose. When a satisfactory response is obtained with recovery of the haemoglobin and a decrease in LDH serum concentrations, taper dose over a period of 4 weeks to 30 mg daily. Thereafter further reduction should be slower to prevent disease recurrence.*

- Prednisone treatment can be stopped when the Coombs' reaction becomes negative.
- If inadequate response add **Azathioprine**, oral, 2.5 mg/kg daily. Titrate to Hb response. May be required for several months. Monitor for neutropenia.
- Patients who fail medicine treatment should be considered for *splenectomy*.

### *Referral*

- When there is no response to medicine treatment.

---

### **1.7.4 Anaemia, Iron Deficiency**

---

- Anaemia due to iron deficiency.
- Common causes of iron deficiency are chronic blood loss or poor nutritional intake. This is usually hypochromic microcytic anaemia

### *Investigations*

- Assess for a haematological response to **Iron** therapy.

### *General Measures*

- Identify and treat the cause. Dietary adjustment.

### *Treatment*

- Oral **Iron** supplementation: reticulocytosis begins on the 3rd or 4th day after therapy, peaks at approximately day ten and lasts between 12 and 21 days.
- Give 100–200 mg of elemental oral iron daily with a meal, e.g.: Ferrous sulphate compound, oral, BPC 170 mg daily with food. (The expected haemoglobin rise is approximately 2 g/dL every 3 weeks.)

## *1. Blood and haematological conditions*

- Continue treatment for 6 months after the haemoglobin has returned to normal in order to replenish the iron stores adequately.
- Prophylaxis: **Ferrous Sulphate** compound 65 mg elemental iron oral, BPC 170 mg daily with meals (e.g. during pregnancy).

**Note:** If there is failure to respond to iron therapy, then consider the following causes: non-adherence, continued blood loss, wrong diagnosis, malabsorption, and mixed deficiency, concurrent folate or vitamin B12 deficiency.

**Note:** The use of parenteral iron may be associated with anaphylaxis. Parenteral iron is only indicated when oral iron is ineffective, e.g. malabsorption or patients on haemodialysis and erythropoietin therapy, or not tolerated. In people who require repeated therapy, the intravenous route is preferred.

- Where a once-off dose is required, give intramuscularly. Minimum required dose is 250 mg of iron per gram of Hb below normal. Use in consultation with a haematologist/specialist.
- Iron sucrose, IV.
  - Total dose = weight (kg) x [11 g/dL – actual Hb (g/dL)] x 2.4 + 200 mg.
  - Maximum daily dose: 200 mg.
  - Administer over 30 minutes in 200 mL **Sodium Chloride 0.9%**.

## *1. Blood and haematological conditions*

- Repeat every second day until the total dose is given.
- Ensure that the correct formulation is given as some preparations can be given IM, or IV only, or both.
- Resuscitation equipment should be ready to manage anaphylaxis.
- Blood transfusion (see above section 1.2)

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### **1.7.4 Anaemia, Megaloblastic**

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Anaemia caused by a deficiency of folate and/or vitamin B12.

#### *Investigations*

- Elevated MCV (mean corpuscular volume) and MCH (mean corpuscular haemoglobin).
- Macro-ovalocytes on blood smear; polysegmentation of neutrophils, thrombocytopenia with giant platelets.
- Decreased serum vitamin B12 or red blood cell folate. Pancytopenia in severe cases.
- Intrinsic factor antibodies in vitamin B12 deficiency, and anti-parietal cell antibodies in pernicious anaemia.

## *1. Blood and haematological conditions*

### *General Measures*

- Dietary modifications to ensure adequate intake of folate and **Vitamin B12**. Identify and treat the underlying cause, e.g. antibiotics for intestinal overgrowth with bacteria.

### *Treatment*

- Start with **Folic Acid** and **Vitamin B12**. Take blood samples for RBC, folate and vitamin B12 levels before starting treatment.
- Monitor serum potassium and replace if necessary.
- Give vitamin B12 and folic acid together until the test results are available as giving folic acid alone in patients with a B12 deficiency may precipitate a permanent neurological deficit.
- Adjust management according to results.
- Folic acid deficiency: Folic acid, oral, 5 mg daily until haemoglobin returns to normal.
- Prolonged treatment may be required for malabsorption states.
- Vitamin B12 deficiency: Vitamin B12, IM. 1 mg daily for 7 days, then weekly for a further 4 doses. Follow with 1 mg every third month for life in patients with pernicious anaemia, except in patients with clearly modifiable nutritional deficiency.



## *1. Blood and haematological conditions*

**Note:** Response to treatment is associated with an increase in strength and improved sense of well-being. Reticulocytosis begins 3–5 days after therapy and peaks at about day 7. The anaemia is corrected within 1–2 months. The white cell count and platelets normalise in 7–10 days. As there is an increase in red blood cell production, short-term iron and folic acid supplementation is also recommended.

- Consider the following if there is failure to respond: co-existing folate and/or iron deficiency, infection, hypothyroidism, myelodysplasia, incorrect diagnosis, and drug-induced, e.g. **hydroxyurea**, **Stavudine** and **Zidovudine**.
- Prophylaxis. Vitamin B12 is indicated for patients after total gastrectomy or ileal resection. Give vitamin B12, IM, 1 mg every third month for life (4 times a year).
- Indications for folic acid: chronic inherited haemolytic anaemias, e.g. sickle cell anaemia, thalassaemia; myeloproliferative disorders; exfoliative skin disorders; increased demands, e.g. pregnancy, chronic haemodialysis. Give Folic acid, oral, 5 mg daily.

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### **1.7.6 Febrile Neutropenia**

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#### *Description*

- Febrile neutropenia is defined as an absolute neutrophil count of  $< 0.5 \times 10^9/L$  with a temperature of greater than  $38^\circ C$  for  $> 1$  hour.
- This is a medical emergency as these patients can rapidly develop features of severe sepsis (multi-organ failure and/or hypotension).

#### *General Measures*

- Treat the underlying cause of neutropenia, if applicable. Withdraw any drug that may cause neutropenia.
- Take blood cultures before starting antimicrobial therapy. Once culture results are available, adjust treatment to the most appropriate narrow spectrum agent.

#### *Treatment*

- For patients with febrile neutropenia within 48 hours of admission: 3rd generation cephalosporin, e.g.: **Ceftriaxone**, IV, 1 g daily. PLUS **Gentamicin**, IV, 6 mg/kg daily.

## *1. Blood and haematological conditions*

- If IV line infection is suspected as the cause at any stage: ADD Vancomycin, IV, 20 mg/kg/dose 12 hourly. Monitor trough levels after the third dose. Adjust dose to maintain a trough level of 15–20 micromol/L.
- If fever develops after 48 hours of admission choice will depend on local susceptibility patterns. One or more of the following antibiotics/classes must be available: Piperacillin/tazobactam, IV, 4.5 g 8 hourly or cefepime, IV, 1 g 12 hourly. OR Carbapenem with activity against Pseudomonas, e.g.: Meropenem, IV, 1 g 8 hourly or Imipenem, IV, 500 mg 6 hourly. Note: Ertapenem is not recommended because it is not effective for pseudomonas species which are important pathogens in this setting.
- If no response after 5–7 days ADD Amphotericin B, IV, 1 mg/kg daily in dextrose 5 % over 4 hours. Ensure adequate hydration to minimise nephrotoxicity. Regular, e.g. 3 times a week, monitoring of potassium, magnesium and renal function is essential.
- Duration of therapy: If neutrophil count increases to  $> 0.5 \times 10^9/L$ , continue for 2 days after fever has settled. If neutrophil count remains  $< 0.5 \times 10^9/L$ , continue for 7 days after fever has settled.

*Referral/Consultation*

- All cases – consult with haematologist/oncologist.

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**1.7.7 Myelodysplastic Syndromes**

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*Description*

- A group of disorders characterised by refractory cytopenias due to bone marrow failure. Anaemia is very common and there is a risk of developing acute leukaemia.

*Investigations*

- Evidence of cytopenia, with normal B12 and folate levels and substantial morphological dysplasia on the blood smear.
- Bone marrow examination confirms dysplasia of the blood elements and the presence of cytogenetic abnormalities.

*Treatment*

- Transfusion should ideally be with leucodepleted red cells to delay immunisation, as these patients require frequent transfusions. Bone marrow transplantation can be curative in selected patients if neutropenic and febrile.

### *Referral*

- All patients for further investigation and management.

## **Bleeding Disorders**

### *General Principles*

A bleeding tendency may result from: a coagulation defect (congenital/acquired), a vessel wall defect, or a platelet defect (quantitative/qualitative).

A careful and detailed history, thorough examination and review of relevant laboratory investigations will allow differentiation between these three categories, as the management of each of these groups differs significantly.

Early consultation with a haematologist or a clinician with expertise in the handling of such patients is advisable.

Patients with a chronic bleeding tendency should be advised to wear a medic alert bracelet which clearly mentions the type of disorder he/she suffers from, e.g. Severe Haemophilia A, Factor VIII <1%, no inhibitors.

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### 1.7.8 Haemophilia A And B, Von Williebrands's Disease

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#### *Description*

Haemophilia A, haemophilia B and von Willebrand's disease are chronic bleeding disorders caused, respectively, by a lack of clotting factor VIII, clotting factor IX and von Willebrand factor (VWF, a carrier protein for factor VIII). Presentation depends on severity of the condition (see classification below). Complications include haemarthrosis with later chronic arthropathy, intracranial haemorrhage, soft tissue and muscle haematomas. Pain/tingling in a joint suggests bleeding into the joint in a known haemophiliac.

- Subclassification (factor VIII and IX deficiency):

CLASS	%OF NORMAL	SIGNS
Mild	5–25%	Occasional bleeds
Moderate	2–5%	
Severe	< 1–2%	Trauma/spontaneous bleeds

## *1. Blood and haematological conditions*

### *Investigations*

- Prolonged partial thromboplastin time (PTT).
- Factor VIII or factor IX concentration < 25% of normal activity. Prolonged bleeding time (Von Willebrand's).
- Patient with factor VIII deficiency should be tested annually for factor VIII inhibitor.

### *General Measures*

- Haemophilia register.
- Ideally, patients should attend a specialised haemophilia centre with a dedicated multi-disciplinary health care team.
- Medic alert bracelet.
- Dental care (consult a haematologist to plan the procedure). Avoid contact sport.
- Acute bleeds into joints: apply ice packs; bed rest; rest the affected joint/limb until pain free and no further bleeding; no weight bearing; splint (no circumferential casting).

### *Treatment*

- For mild to moderate pain: Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours. If needed ADD Tramadol, oral, 50mg, 6 hourly.

## *1. Blood and haematological conditions*

- For severe pain give Morphine, IV, 10 mg 4 hourly.
- **Exercise great caution** when taking blood specimens. Taking blood from femoral veins is absolutely contra-indicated. Avoid IM injections. Avoid aspirin and NSAIDS.
- Refer to haematologist/specialist for management including when contemplating dental extraction.

### *Referral*

- All cases with suspected haemophilia (prolonged PTT and normal INR) to a haemophilia treatment centre, for assessment, genetic counselling and planning of management.
- Patients with proven antibodies against factor VIII.
- For further replacement, complex situations and complications consult a Haematologist.

---

### **1.7.9 Immune Thrombocytopenic Purpura (ITP)**

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#### *Description*

- A common bleeding disorder due to immune destruction of platelets. To diagnose ITP, isolated thrombocytopenia is present (rest of the complete blood count, including an examination of the peripheral blood smear, is entirely normal).



## *1. Blood and haematological conditions*

Clinically apparent associated conditions, drugs (e.g. penicillins, cephalosporins, quinine, rifampicin and heparin), or other agents that may cause thrombocytopenia are NOT present. Patients with suspected ITP should be tested for SLE and for HIV infection.

### *Investigations*

- Thrombocytopenia with normal white cell count and red cell series. Anaemia may be present due to blood loss.
- Peripheral blood smear to exclude RBC fragments. Smear may show large platelets.
- Do INR and PTT, which should be normal in ITP.
- If there is a poor response to treatment do a bone marrow biopsy.

### *General Measures*

- **Avoid:** medication that affects platelet function, e.g. NSAIDs and aspirin; platelet transfusions unless life-threatening bleeds; dental procedures in acute phase, and IM injections.
- Reassure the patient that resolution usually occurs in acute ITP. Medic alert bracelet.
- Platelet transfusions may be given if surgery is required or in life-threatening bleeding.

### *Treatment*

- **Acute ITP:** Prednisolone, oral, 2 mg/kg daily. Taper dose once response is achieved, usually within 10–14 days. Therapy may be required for a few months before prednisone is eventually discontinued. Also indicated for HIV-associated immune thrombocytopenia. Also start combination antiretroviral therapy urgently in these patients.
- Platelet transfusions: platelet transfusions are only indicated in acute active bleeding uncontrolled by other means or before procedures. In an adult, 1 mega-unit of single donor, leucocyte depleted platelets is usually sufficient to control the bleeding initially. Platelet transfusions have limited benefit in this condition as platelets are rapidly destroyed by the immune system.

### *Referral*

- All cases not responding to steroids and, in the case of HIV patients, not responding to ART – discuss with haematologist.

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### **1.8.0 Thrombotic Thrombocytopenic Purpura-Haemolytic Uraemic Syndrome (TTP-HUS)**

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#### *Description*

- Acute syndromes with abnormalities in multiple organ systems with evidence of micro-angiopathic haemolytic anaemia and thrombocytopenia. This condition presents with: anaemia; thrombocytopenia, often with purpura but not usually severe bleeding; acute renal insufficiency that may be associated with anuria and may require acute dialysis; neurologic abnormalities, and fever.
- TTP-HUS is associated with HIV infection and patients should be tested for HIV. TTP-HUS should be distinguished from disseminated intravascular coagulation (DIC) and severe pre-eclampsia where the coagulation profile is deranged.

#### *Treatment*

- In HIV-associated thrombotic thrombocytopenia, start combination antiretroviral therapy urgently.
- Fresh frozen plasma, IV infusion, 30 mL/kg in 3–4 divided doses. The use of platelet transfusions should be discussed with a specialist.

*Referral*

- All patients – discuss with a haematologist.

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**1.8.1 Acquired Coagulation Defects**

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**1.8.2 Disseminated Intravascular Coagulation (DIC)**

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*Management*

- Identify and treat the underlying cause.
- If the patient is bleeding, replace haemostatic factors with cryoprecipitate or fresh frozen plasma.
- If the patient is not actively bleeding and platelet count > 20 000, then platelet transfusion is not necessary.
- Replacement therapy for thrombocytopenia should consist of 1 apheresis single donor unit / megaunit (expected platelet count increment 30–50 x 10<sup>9</sup>/L) or 6 random donor units (expected increment 50–60 x 10<sup>9</sup>/L), ideally aiming to raise the platelet count > 50 x 10<sup>9</sup>/L.
- In chronic DIC, or in the absence of bleeding, platelet transfusions should not be given merely to correct the thrombocytopenia.
- For hypofibrinogenaemia: Cryoprecipitate, 8–10 units.

## *1. Blood and haematological conditions*

- For depletion of other coagulation factors: Fresh frozen plasma, 2–4 units, i.e. 15–20 mL/kg as initial dose. Volume:  $\pm 280$  mL/unit.
- Repeat replacement therapy 8 hourly or less frequently, with adjustment according to the clinical picture and laboratory parameters.
- Perform frequent estimation of the platelet count and coagulation screening tests.

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### **1.8.3 Disseminated Intravascular Coagulation (DIC)**

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### **1.8.4 Venous Thrombo- Embolism**

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#### *Description*

- Venous thrombosis should be seen as a spectrum from calf deep venous thrombosis to pulmonary thrombo-embolism. All patients should be seen as high risk.
- Differential diagnosis include: cellulitis, superficial thrombophlebitis, chronic venous insufficiency, lymphoedema, popliteal (Baker's) cyst, internal derangement of the knee, and calf muscle pull or tear
- Diagnosis is primarily clinical and confirmed with imaging studies, e.g. Doppler.

*General Measures*

- **Acute management:** in pulmonary embolism, cardiovascular resuscitation may be necessary and surgery may be undertaken for intractable disease.
- **Note:** Superficial thrombosis does not require anticoagulation. Distal venous thrombosis in the lower limbs, i.e. involving tibial veins only, need not be treated with anticoagulants.
- Monitor patients with repeat ultrasound if anticoagulants are not used. Ultrasonography should be repeated after a week but may be omitted if D-dimer is negative.
- **Prophylaxis:** Advice on prophylaxis should be emphasised. Eliminate all predisposing factors. Prevent deep vein thrombosis.

*Treatment*

- **Acute treatment:** unfractionated heparin initially, plus simultaneous warfarin. After 4–6 days, heparin is usually stopped and oral warfarin continued when a therapeutic INR level is reached. Note: Heparin and warfarin therapy should overlap for at least 5 days.

*1. Blood and haematological conditions*

- For proximal venous thrombosis and/or pulmonary embolism: Unfractionated heparin, SC, 333 units/kg as an initial dose. Follow 12 hours later by 250 units/kg/dose 12 hourly.

Units of unfractionated heparin		Volume of heparin in mL (25 000 units/mL)		
Weight (kg)	Loading dose (units)	12 hourly dose (units)	Loading dose (mL)	12 hourly dose (mL)
35 kg	11 000 units	8 750 units	0.44 mL	0.35 mL
40 kg	13 000 units	10 000 units	0.52 mL	0.4 mL
45 kg	15 000 units	11 250 units	0.6 mL	0.45 mL
50 kg	17 000 units	12 500 units	0.67 mL	0.5 mL
55 kg	18 000 units	13 750 units	0.73 mL	0.55 mL

## 1. Blood and haematological conditions

60 kg	20 000 units	15 000 units	0.8 mL	0.6 mL
65 kg	22 000 units	16 250 units	0.87 mL	0.65 mL
70 kg	23 000 units	17 500 units	0.93 mL	0.7 mL
75 kg	25 000 units	18 750 units	1 mL	0.75 mL
80 kg	27 000 units	20 000 units	1.07 mL	0.8 mL
85 kg	28 000 units	21 250 units	1.13 mL	0.85 mL
90 kg	30 000 units	22 500 units	1.2 mL	0.9 mL

- **NB:** Evidence indicates that PTT monitoring is not necessary with weight based dosing. However in morbid obesity and renal failure (eGFR < 30 mL/minute) unfractionated heparin should be used with PTT monitoring to maintain the PTT at 1.5 to 2.5 times the control. PTT should be taken 4 hours after SC dose.



## *1. Blood and haematological conditions*

OR

- Low molecular weight heparin, e.g. enoxaparin, SC, 1 mg/kg 12 hourly.
- Do not use LMWH in morbid obesity and renal failure (eGFR <30 mL/minute).
- Follow with: Warfarin, oral, 5 mg daily. Adjust dose to keep INR within therapeutic range. Continue warfarin for 3 months if there was a transient precipitating cause. Continue life-long if there is a non-transient precipitating cause or if repeated episodes. Contraindications for warfarin: first trimester and the last month of pregnancy. In these instances, replace with heparin.
- Most patients can be managed successfully with therapeutic anticoagulation. Thrombolytic therapy is indicated only in patients with angiographically confirmed early pulmonary embolism where haemodynamic stability cannot be achieved. Discuss with a specialist.
- Prophylaxis: prophylaxis is indicated for most medical and surgical patients. Low molecular weight heparin, e.g.: Dalteparin, SC, 5 000 units daily. OR unfractionated heparin, SC, 5 000 units 12 hourly.

## *1. Blood and haematological conditions*

- Although the risk of bleeding is small, in the following patients prophylaxis should only be used under exceptional circumstances: active bleeding; intraocular, intracranial or spinal surgery; lumbar puncture or epidural anaesthesia within 12 hours; renal insufficiency; coagulopathy; or uncontrolled hypertension.

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### **1.8.5 Heparin induced thrombocytopenia**

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- A severe immune-mediated drug reaction occurring in 1–5% of patients receiving heparin (unfractionated or low molecular weight heparin) therapy. It presents with thrombocytopenia and thrombosis. Diagnosis needs a high index of suspicion and should be considered if a patient has a 50% drop in platelet count within 5–10 days after initiating heparin therapy. Confirmation is done by positive antibody testing.
- Stop heparin and refer all patients.

#### *Referral*

- Refer all patients with Heparin-induced thrombocytopenia.

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## 2.0 Cardiovascular diseases

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### 2.1 Acute Heart Failure (Pulmonary Edema)

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*Signs and symptoms:*

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

*General measures:*

- Prop up patient to sitting position
- Restrict fluids

*Treatment:*

- Oxygen therapy
- Drain pleural effusions if present.
- If BP >120/80, give sublingual Nitroglycerin for pulmonary vascular dilation
- Alternatively Digoxin if low systolic BP

*Adults:*

- **Frusemide** 40-80 mg slow IV (over 5 mins). Repeat if required
- Intravenous Morphine 2.5 mg -5-10mg (Be cautious of patients with low blood pressure) and **Metoclopramide** 10mg IV.
- Repeat both if required.

## 2. Cardiovascular diseases

### *Alternatively:*

#### **Second Line action (refer patient to next level of care)**

- Depends on systolic blood pressure
  - Nitrates if SBP >100mmHg
  - Dopamine /Epinephrine if SBP 70-100 mmHg and with signs and symptoms of shock

### *Children:*

- Give **Morphine 0.1-0.2mg/kg** slow IV (over 5 mins) Repeat every 4 hours if required
- Give **Frusemide 1-2mg/kg** IV, po.
- Specific treatment should be given according to the cause e.g. hypertension

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## **2.2 Congestive Heart Failure**

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- Defined as a clinical syndrome in which patients have typical symptoms and signs resulting from abnormalities of Ventricular function
- Heart failure is a syndrome not a final diagnosis therefore it is very important to establish the cause

### *Signs and symptoms:*

- Shortness of breath, fatigue, Orthopnoea, Paroxysmal nocturnal dyspnea, ankle and body swelling

## 2. Cardiovascular diseases

### *General measures*

- Patient and family education on heart failure
- Restriction of fluids
- Reduce salt intake
- Moderate exercises
- Stop smoking and alcohol intake
- Clinicians to screen and treat other comorbidities

### *Symptomatic relief:*

- Give **Furosemide** 40-160 mg in divided doses
- Give **Digoxin** (0.125 mg daily) is recommended in patients with heart failure and rapid atrial fibrillation

### *Symptomatic relief and mortality benefit:*

- ACE inhibitors: **Enalapril**, start at low doses 2.5-5mg and escalate to 10 mg twice a day.
- Spironolactone: 25 mg daily dose for patients with persistent symptoms of heart failure (NYHA II-IV)

**Note:** ARB (Angiotensin Receptor Blocker) or Hydralazine + Nitrate can be an alternative if a patient cannot tolerate ACE inhibitors or has acute renal failure.

## 2.3 Congenital Heart Disease

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*Important points in history and exam:*

- Cyanosis- Clinician should determine: when was it noted, was it present all the time, or what brings a cyanotic spell, does child squat?

*Other cardiac symptoms:*

- Breathlessness on feeding, sweating, failing to thrive, easily fatigued
- Dysmorphic, clubbed, cyanosed, pulse rate and volume, Bp, apex beat location, hepatomegaly and oedema, bulging chest

*Indications for admission:*

- Cyanosis in any child with acute cyanosis (except if longstanding and has already been investigated)
- Any evidence of acute cardiac failures. If child has a heart murmur, then may be referred to a hospital clinic

## *2. Cardiovascular diseases*

### *Cyanotic congenital heart disease presenting in newborn as cyanosis:*

- Consider if blue baby doesn't pink up with oxygen, may or may not have signs of heart failure nor murmur. May be difficult to distinguish from persistent pulmonary hypertension
- Investigate with chest x ray and or cardiac echo, parental counselling re condition. Baby might have persistent pulmonary hypertension give oxygen in this case.

### *Cyanotic congenital heart disease presenting as cyanosis in older child*

- Usually Tetralogy of Fallot, associated with hypercyanotic spells

### *Management of spell*

- Place child in knee chest position or encourage squatting in older child.
- Give oxygen
- Give IM or IV **Morphine** 0.1mg/kg or oral **Propranolol** 0.5mg/kg statistically

### *Long term management*

- **Propranolol** 1mg/kg BD to prevent spells

***Congenital heart disease causing heart failure***

- Examples include Large <ventricular septal defect, AtrioVentricular septal defect, large persistent ductus arteriosus

***Management***

- Manage cardiac failure as per protocol
- Refer to hospital clinic
- If child has not developed pulmonary hypertension may benefit from surgery
- Generally, antibiotic prophylaxis against bacterial endocarditis when undergoing dental treat or any surgery (see infective cardiac disease)

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**2.4 Hypertension**

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- 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



## 2. Cardiovascular diseases

- Causes include:
  - Renal disease (glomerulonephritis, Hemolytic uraemic syndrome, renal failure, cystic renal disease)
  - Renovascular (renal artery stenosis)
  - Cardiovascular (coarctation of the aorta)
  - Endocrine (Cushing's, neuroblastoma)

### Children:

- Refer all children with hypertension to a doctor for management
- In children, hypertension is defined statistically because BP levels vary with age and outcome. Based data are not available for this population. Hypertension is defined as systolic and /or diastolic pressure levels greater than the 95<sup>th</sup> percentile for age and gender on at least 3 occasions
- The upper limit for normal systolic Bp in children greater than One year may be calculated as follows:
  - $(\text{Age in years} \times 3) + 100$
  - Diastolic BP is 2/3 of systolic BP

## 2. Cardiovascular diseases

- The table below shows normative blood pressure levels (systolic/diastolic) in children up to age 5 years. Blood pressures above the 95th percentile indicate hypertension

Age	Mean BP levels	95 <sup>th</sup> Percentile
1-3 days	64/41 (50)	78/52 (62)
1mo -2yr	95/58 (72)	110/71 (86)
2-5yr	101/57 (74)	115/68 (85)

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

### 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
- Lose weight
- Avoid excessive alcohol consumption

## 2. Cardiovascular diseases

**Note:** 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

### *Stepped anti-hypertensive treatment approach (adults):*

- **Step 1: Hydrochlorothiazide** 25 mg each morning, increasing the dose is not advised Explain to the patient that treatment must be regular (every day), closely monitored and generally has to be taken for life
  - Alternatively, give **Bendrofluazide** 2.5 mg each morning

**Note:** Avoid in pregnancy and breast-feeding

- **Step 2: Give Hydrochlorothiazide** 25mg once daily and **Amlodipine** 5-10mg once daily

## 2. Cardiovascular diseases

- Where **Amlodipine** is not available **Nifedipine** 10-20mg slow release tablets twice daily can be used.
- **Step 3: Give Hydrochlorothiazide** 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: Give Hydrochlorothiazide** 25mg once daily and **Amlodipine** 5-10mg 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
- (iv) For patients taking ART, because of the interactions between Calcium Channel Blockers, and NNRTIs, please consider **Enalapril** or **Atenolol** before a Calcium Channel Blocker.

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### 2.4.1 Emergency hypertension treatment

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*Signs and symptoms:*

- 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

## 2. Cardiovascular diseases

**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:*

- Give **Hydralazine** 5-10 mg IM
- Repeat up to every 1 hour as necessary
- *If heart failure:* add **Frusemide** 40 mg IV stat

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

## 2. Cardiovascular diseases

### Children:

- *For fluid overload:* Give **Frusemide** 1 mg/kg bolus IV or IM
- *hypertensive encephalopathy:* Give **Hydralazine** 0.15 mg/kg slow IV
  - 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.

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### 2.5 Ischiemic Heart Disease

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- Condition in which there is inadequate blood and oxygen supply to any portion of the myocardium

#### *General measures*

- Minimize risk factors by:
  - Weight reduction (if obese)
  - Control of hypertension
  - Control of diabetes
  - Stop smoking
  - Address other factors such as:
    - High blood cholesterol
    - Stressful lifestyle
    - Excessive alcohol intake
- Encourage regular moderate exercise

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### 2.5.1 Stable Angina (infrequent attacks)

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- Central chest pain (squeezing, heavy discomfort) with radiation to the left arm on exertion or at rest lasting 2-5 minutes, crescendo and decrescendo pattern

#### *Treatment*

- Give **Aspirin** 150 mg daily

#### *Acute relief of Angina*

- Give **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
- Alternatively use **Isosorbide Dinitrate** 5-10mg sublingually as required instead of **Glyceryl Trinitrate**

#### *Long term management*

- Check correct doses
- **Atenolol** 50 mg bd
- **Amlodipine** 5-10mg daily/Nifedipine 10-20 mg daily replace or be cautiously added to Atenolol
- If pain continues despite the above treatment refer to Medical Specialist



## 2. Cardiovascular diseases

### *Red flags*

- UNSTABLE ANGINA, NON ST SEGMENT MYOCARDIAL INFARCTION
  - Central chest pain as above lasting more than 10 minutes and has a crescendo pattern
- ACUTE MYOCARDIAL INFARCTION (ST SEGMENT ELEVATION)
  - Typical angina pain plus most patients being restless, anxious, pale and with cold extremities

### *Treatment*

- Nitrates and Morphine 2-5mg IV for pain control if there is no hypotension
- URGENTLY DISCUSS THESE PATIENTS WITH MEDICAL SPECIALIST!

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## **2.6. Peripheral Arterial Disease**

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- If there are poor pulses and delayed capillary refill, or claudication or non healing wounds, consider adding Aspirin and Statin
- Patients with critical limb Ischemia should be referred to high level of care to avoid death from septic shock

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## 3.0 Central Nervous System Conditions

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### 3.1 Seizures and Epilepsy

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#### 3.1.1 Seizures

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- 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 IV 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. If repeated seizures, consider antiepileptic therapy.

### *3. Central nervous system conditions*

- Look for treatable causes and provoking factors (malaria, infection, tumour, alcohol).
- Diazepam IM absorbs slowly and unreliably: IV or rectal routes are preferable

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#### **3.1.1.1 Generalized seizures in children**

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##### *Treatment*

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

##### *Alternatively*

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

*or*

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

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### 3.1.1.2 Partial seizures in children

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*Treatment*

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

*Alternatively*

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

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### 3.1.1.3 Petit mal

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*Treatment*

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

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### 3.1.2 Status Epilepticus

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- 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.

### 3. Central nervous system conditions

#### *Treatment Adults:*

- Give **Diazepam** 5-10 mg IV. Repeat every 10 minutes until the patient stops convulsing. If patient not controlled give continuous diazepam IV infusion with careful attention of respiratory depression.
- Give a loading dose of anti-epileptic medicines:
  - Give **Phenytoin** 15 mg/kg (600-1200 mg) IV. 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) IV: dilute with water for injection 1:10 and give slowly, no more than 100 mg/minute. Or give 200 mg IM in each buttock
- If status continues, give **Paraldehyde** 5 ml deep IM in a buttock, and repeat 5 ml IM in alternate buttock. **Paraldehyde** can also be given through the rectum using a syringe with needle 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

### *3. Central nervous system conditions*

- Give **Thiamine** 100mg IV or IM 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 and continue until cause of status epilepticus is treated.

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#### **3.1.3 Epilepsy**

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- 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.

### *3. Central nervous system conditions*

- 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.

### 3. Central nervous system conditions

#### *Treatment*

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

#### *Alternatively*

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

*or*

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

*or*

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

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## 3.2 Stroke

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- There are 2 types of stroke: Ischaemic/Embolic and Haemorrhagic. Without imaging (not commonly available) you cannot distinguish. Ischaemic is more common. (Sudden reduction of blood flow to the brain resulting in a neurological deficit corresponding to that area of the brain's function.)



### 3. Central nervous system conditions

#### Common Symptoms

##### Clinical features

- Facial drooping, slurred speech, dragging a leg, arm/leg weakness on one side.

##### Acute Treatment

- All strokes are likely to benefit from statin therapy. Commonly used statin is **Simvastatin** and **Atorvastatin** as second line therefore it will be ideal to put **Simvastatin** 10-20 mg nocte
- Ischaemic stroke benefits from **Aspirin**: 300mg chewed x1 then 75mg od
- Ischaemic: allow BP to remain moderately elevated for 1-2 weeks (140-180/90-100) then treat to normal.
- Haemorrhagic: reduce BP faster (140/190) and avoid **Aspirin**
- Assess safety/ ability to swallow without aspirating (NG tube if needed)

If signs of increased intracranial pressure (vomit, lower level of consciousness) should be given **Mannitol**.

##### Chronic Treatment

- Rehabilitation/ physiotherapy
- Treat underlying conditions with reference to their sections, such as: Syphilis, HIV, Diabetes, Hypertension, Hyperlipidemia (simvastatin), atrial fibrillation (aspirin or warfarin)

### 3. Central nervous system conditions

#### **Note:**

- Conditions that may present similar to Stroke include Subdural haematoma brain masses, meningitis, and encephalitis.
- Recurrent stroke when already taking **Aspirin** should be referred to a specialist.
- 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*

- Give long term **Aspirin** 75mg once daily

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

- Give IV fluids to correct any dehydration, avoid IV glucose.
- Treat hyperglycemia
- Treat any fever: look and treat for infections (aspiration pneumonia, urinary tract infection common).
- Give **Paracetamol** 1g every 8 hours orally to reduce fever.

### *3. Central nervous system conditions*

- Keep patient half seated if increased intracranial pressure is suspected (e.g. in drowsy or unconscious patients).
- Don't start new antihypertensives during the first 10 days.
- If hypertension is repeatedly higher than 180/120 mmHg, start
- Give **Hydrochlorothiazide** 25mg once daily orally
- Start physiotherapy on day 1.
- Start mobilisation as soon as it is possible. Consider referral to an institutional rehabilitation unit.

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#### **3.2.1 Subarachnoidhaemorrhage**

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##### *Description*

Bleeding into the subarachnoid space, most commonly due to the rupture of a vascular aneurysm. Patients frequently present with an acute onset of severe headache and may have additional neurological symptoms and signs. Diagnosis is confirmed preferably by neurological imaging and, when this is not available, urgently do lumbar puncture, demonstrating xanthochromia.

##### *General Measures*

Maintain normal hydration and electrolyte status. Control blood pressure.

### *3. Central nervous system conditions*

#### *Treatment*

Analgesia if level of consciousness is not impaired:

- Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours.

*If no response:*

- Morphine, IV, 1–2 mg/minute to a maximum total dose of 10 mg. Dilute 10 mg up to 10 mL in sodium chloride solution 0.9%. This may be repeated 4 hourly.

### *3. Central nervous system conditions*

Avoid NSAIDs.

In patients with grades 1 to 3 impairment of consciousness level while waiting for transfer to neurosurgical facility and in consultation with neurosurgeon:

- Give **Nimodipine**, oral, 60 mg 4 hourly for 21 days.

#### *Referral*

- All patients with minimal impairment of consciousness level for possible angiography and appropriate neurosurgical management. Patients initially deemed unsuitable for further investigation, may be referred at a later stage, should their condition improve.
- For neurological imaging: patients in whom the diagnosis has to be confirmed radiologically and where a lumbar puncture may be considered hazardous.

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### 3.3 Headaches and Facial Pain Syndromes

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#### 3.3.1 Migraine

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##### *Description*

Episodic headache, usually focal in nature, which may occur with or without an aura. It is usually accompanied by nausea and vomiting. Several variants of migraine also occur.

##### *General Measures*

Reassure patient that this is a benign condition. Attempt to identify any precipitating factors or food allergies from the history (although this is usually unrewarding), and try to diminish patterns of tension.

##### *Treatment*

###### Acute treatment

Initiate therapy during the attack or at the onset of the headache.

###### Analgesics, e.g.:

- Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours.

OR

###### NSAIDs, e.g.:

- Ibuprofen, oral, 800 mg immediately then 8 hourly, if needed.

If severe and not responding to therapy above:

- Morphine, IM, 10 mg as a single dose.

### 3. Central nervous system conditions

For nausea:

- Give **Metoclopramide**, oral/IM, 10 mg 8 hourly.

Prophylaxis

Regular, daily, prophylactic therapy is advised if:

- attacks are frequent, i.e. more than 2–3 per month, or
- severe, causing a significant amount of disability, or attacks are long lasting.
- Also consider for patients who tolerate therapy for acute attacks poorly.

*Give:*

- **Amitriptyline**, oral, 10–25 mg at bedtime. Titrate dose up to adequate response. More than 75–150 mg as a single bedtime dose is seldom required.

OR

- Propranolol, oral, 20–80 mg q12h. Note: The evidence for using atenolol for this indication is limited.

OR

- Carbamazepine, oral. Start with 100 mg q12h. Increase every two weeks up to a maximum of 400 mg 12 hourly.

**Note:** Only about half of patients will respond to one of these agents and this response may take 1 to 2 months to occur.

### 3. Central nervous system conditions

#### *Referral*

- Patients with unexplained neurological signs, additional risk factors for an alternate diagnosis, such as immune deficiency, or an atypical short history require brain imaging.
- Sudden onset of a first severe headache, even if it resembles migraine, as this may indicate serious organic pathology, such as subarachnoid haemorrhage.
- Acute migraine, not responding to treatment.
- Recurrent migraine not controlled with prophylactic therapy.

---

#### **3.3.2 Cluster Headache**

---

#### *Description*

Repetitive episodes of excruciating headache typically of short duration (up to 2 hours) in clusters for weeks to months at a time. Typically the headache is of sudden onset, unilateral during the specific cluster, and quickly reaches a climax. Associated redness of the eye with lacrimation and rhinorrhoea occurs.

#### *Treatment*

Oxygen inhalation may abort some episodes. Analgesics are ineffective in this indication. To induce rapid remission in patients with episodic cluster headache:

- Prednisone, oral, 40 mg daily for 5–10 days. Tapering is not necessary when the above duration is used.



### 3. Central nervous system conditions

OR

- Verapamil, oral, 40 to 80 mg 8 hourly.

#### *Referral*

- When there is inadequate response to treatment.

---

### 3.3.3 Trigeminal Neuralgia

---

#### *Description*

Severe, very short lived stabs of facial pain in the sensory trigeminal distribution. It is important in the diagnostic workup to exclude intracranial mass lesions, which may impinge on the trigeminal nerve.

#### *Treatment*

- Carbamazepine, oral, 100 mg 2–3 times daily, initial dose. Increase dose slowly. Doses of up to 1,200 mg daily may be required. After exacerbation, reduce to maintenance dose of 400–800 mg daily.

#### *Referral*

- For neuro-imaging, if not available locally.
- If there is poor response to single drug therapy.

---

### 3.3.4 Tension Headache

---

#### *Description*

Headache over the back of the head, but sometimes over the entire head, described as a tight band around the head, usually worse in the afternoon.

### *3. Central nervous system conditions*

#### *General Measures*

Consider use of relaxation techniques. The importance of this diagnosis is the exclusion of other, more sinister conditions. Exclude analgesia overuse headache.

#### *Treatment*

- Amitriptyline, oral, 10–75 mg at night.

#### *Referral*

- When there is atypical pain, suggestive of alternate diagnosis.
- When there is poor response to therapy.

---

## 3.4 Infectious and Parasitic Conditions

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### 3.4.1 Viral Meningoencephalitis

---

#### *Description*

Patients present with headache, fever and mild meningism. Lumbar puncture typically shows mildly elevated protein, normal glucose and mildly raised cells (< 500), mainly lymphocytes (early on polymorphs may predominate). Most cases do not require specific therapy, other than analgesia.

#### *Treatment*

Analgesia, i.e.:

- Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours.

AND

- Tramadol, oral, 50 mg 6 hourly.

OR

- Morphine, IV, 1–2 mg/minute to a maximum total dose of 10 mg. Dilute 10 mg up to 10 mL in sodium chloride solution 0.9%. This may be repeated 4 hourly.
  - Beware of respiratory depression in patients with reduced level of consciousness.

### *3. Central nervous system conditions*

Clinical features are fever, change in behaviour and seizures, which may be either focal or generalised.

Evidence of mucocutaneous involvement is usually not present. Lumbar puncture shows the above features of viral meningoencephalitis, but in this condition may be additionally haemorrhagic in nature. A temporal focus on EEG or neuro-imaging is strongly supportive of the diagnosis. A positive HSV PCR test on CSF is diagnostic.

- **Aciclovir**, IV, 10 mg/kg 8 hourly for 21 days. Start therapy as early as possible, i.e. before results are available. If PCR is negative, stop treatment.

Treat seizures appropriately with **Phenytoin** or **Carbamazepine**.

It is important to initiate therapy and then refer to centre where neuro- imaging is available.

#### *Referral*

- For neuro-imaging: patients not responding or worsening in condition, i.e. decrease in consciousness and cranial nerve palsies, despite appropriate therapy.

### *3. Central nervous system conditions*

- This is especially urgent in patients with tuberculous meningitis, who may develop hydrocephalus and require an urgent shunting procedure.
- Patients with shunts.

---

#### **3.4.2 Brain Abscess**

---

##### *Diagnosis*

Patient may present with focal neurological signs and signs of infection. Neurological signs may not always be prominent. Neuro-imaging usually confirms diagnosis. Patients may have concomitant infection of ears, paranasal sinuses or lower respiratory tract.

##### *Treatment*

Empiric antibiotic therapy

- Ceftriaxone, IV, 2 g 12 hourly.

PLUS

- Metronidazole, oral, 400 mg 8 hourly or IV, 500 mg 8 hourly. Adjust according to antimicrobial sensitivity after surgical drainage.

##### *Referral*

- All, as patients require urgent neurosurgery opinion and treatment.

---

### 3.4.3 Neurocysticercosis

---

#### *Diagnosis*

Patients may present with seizures and/or focal neurological deficit. Typical cystic lesions are seen on neuro-imaging.

#### *General Measures*

Health education.

Surgery for treatable ventricular blockage or spinal or intraocular cysts.

#### *Drug Treatment*

For active or viable cysts only:

- **Albendazole**, oral, twice daily for 8 days. > 60 kg: 400 mg. < 60 kg: 7.5 mg/kg to a maximum of 800 mg daily. Do not use in pregnancy.

Progressive recovery may occur for a period of up to one year. The presence of viable cysts does not require repeating antihelminthic treatment.

Drug-induced damage to cysticerci may precipitate an acute inflammatory reaction, the intensity of which is related to the number of viable cysts and may cause cerebral oedema. This reaction is minimised by adding corticosteroids to the antihelminthic treatment, e.g.: **Prednisone**, oral, 60 mg daily for 8 days.

Anticonvulsants, if required.

---

## 3.5 Movement Disorders

---

### *Description*

Abnormalities of movement/initiation of movement, divided into those with reduction of movement (hypokinesia or bradykinesia), or those with excessive movements (hyperkinesia).

### *Referral*

- To differentiate functional from organic disorders.
- Tardive dyskinesia.
- All complicated cases, i.e. patients with Parkinsonism, not responding to small doses of carbidopa/levodopa.
- Patients with Parkinsonism developing disease-, drug- or autonomic nervous system complications.
- Patients with myoclonus or chorea, not responding to therapy.

---

### 3.5.1 Parkinson's Disease

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#### *Description*

Parkinsonism is a syndrome characterised by tremor, rigidity, bradykinesia and postural disturbances. It may be primary, i.e. Parkinson's disease, or secondary, i.e. drug-induced or due to uncommon disorders that may initially resemble Parkinson's disease.

### *3. Central nervous system conditions*

#### **The objective of treatment is to:**

- minimise disabling symptoms,
- prevent complications and avoid serious drug-induced side effects, and
- exclude secondary forms.

#### *General Measures*

Educate the patient. General supportive therapy and advice about lifestyle modification, physiotherapy and occupational therapy.

#### *Treatment*

**Note:** Set therapeutic targets so that the patient is functioning as well as possible.

#### **Primary Parkinsonism**

#### **Bradykinesia, rigidity and postural disturbance:**

- Carbidopa/levodopa, 25/100 mg, oral, ½ tablet 8 hourly. Increase dose in consultation with a specialist.

If optimal control has not been achieved, consider an alternative diagnosis or changing to a drug containing a higher dose of levodopa: Carbidopa/levodopa 25/250 mg. Specialist initiated.



### *3. Central nervous system conditions*

#### *Drug-induced Parkinsonism*

Anticholinergics have a very small role in this setting and should be used with caution.

Anticholinergic agent, e.g.: **Orphenadrine**, oral, 50 mg 8 hourly.

#### **Tremor only:**

Consider anticholinergic agent, e.g.:

- **Orphenadrine**, oral, 50mg 8 hourly.  
Increase gradually according to clinical response or maximum dose of 400mg daily
- Usual dose: 150–250 mg daily.

#### *Acute dystonic reaction*

Usually follows administration of dopamine antagonistic drug, e.g. **Metoclopramide** and

**Phenothiazines**. Anticholinergic agent, e.g.: Biperiden, IM/IV, 2 mg. Repeat as necessary.

#### *Referral*

- If there is no improvement or poor control with treatment.
- Increasing on/off phenomenon.
- Dyskinesias.

---

### 3.5.2 Essential Tremor

---

#### *General Measures*

Exclude and manage alternate causes, such as drugs, thyrotoxicosis, hyperadrenergic states and psychiatric disorders.

Occasionally a patient may present with essential tremor and an additional neurological condition, which may make the diagnosis difficult.

#### *Medicine Treatment*

If tremor is severe and interfering with normal daily activity: Give  $\beta$ -blocker, e.g.:

- **Propranolol**, oral, 60–320mg daily in divided doses.

---

### 3.5.3 Myoclonus

---

#### *Description*

Irregular, involuntary movements due to muscle jerks, which may be due to myoclonic seizures, but may follow injuries to the brain and are thus not always of an ictal nature.

#### *Referral*

- All patients where the diagnosis is unclear.

---

### 3.5.4 Chorea

---

#### *Description*

Involuntary random, irregular movements.

Aetiology is classified as:

- primary – Huntington’s chorea, benign hereditary chorea and others; or
- secondary – due to Sydenham’s chorea, vascular pathology, metabolic, endocrine and infective conditions, amongst others.

#### *Treatment*

- Give **Haloperidol**, oral, 0.5– 5 mg 2–3 times daily.

*To be prescribed by a specialist only.*

---

### 3.5.5 Neuropathy

---

#### *Description*

Defective functioning of nerves, which may involve both peripheral nerves (peripheral neuropathy) and cranial nerves. Different patterns are noted, i.e. polyneuropathy, mononeuritis multiplex and mononeuropathy, each of which may be caused by axonal degeneration or demyelination or a combination of the above.

### *3. Central nervous system conditions*

Clinical features may be predominantly of a sensory, sensorimotor or motor nature.

Important causes of neuropathy include:

- alcohol,
- diabetes,
- HIV infection,
- thiamine deficiency,
- acute inflammatory demyelinating polyradiculoneuropathy (Guillain-Barrè), and
- chronic inflammatory demyelinating polyradiculoneuropathy (CIDP).

#### *General Measures*

Observe rate of progression. If the disease is progressing fairly rapidly, i.e.

deterioration noted over 5-7 days, admit patient and monitor ventilatory status carefully with spirometry, as intubation and ventilatory support may be required.

Remove the cause where possible, i.e. drug- or alcohol-induced neuropathy, control diabetes mellitus, etc. Specialised nursing care and dedicated physiotherapy may be indicated.

If not managed appropriately, chronic cases may develop contractures, weakness affecting gait, develop chronic bedsores and become wheel chair- bound.

### 3. Central nervous system conditions

#### Treatment

Most cases respond to management of the underlying disease process or removal of the aetiological agent.

Neuropathic pain (i.e. pain due to a disease or injury of the central or peripheral nervous system)

- Give **Amitriptyline**, oral, 25–75 mg daily.

OR

- Give **Carbamazepine**, oral, 200–1200 mg daily in divided doses.

Isoniazid–induced polyneuropathy

- Give **Pyridoxine**, oral 75 mg daily for 3 weeks. Follow with 25–50mg daily.

Post-herpes zoster neuropathy (**Note:** Aciclovir is not beneficial in treating this condition).

- Give **Amitriptyline**, oral, 25–75 mg daily.

AND/OR

- Give **Carbamazepine**, oral 200–1200 mg daily dose in divided doses. Beware of possible drug interactions in patients on ART.

#### **Bells' palsy Note:**

Exclude herpes zoster

Start within 4 days of onset of symptoms:

- Give **Prednisone**, oral, 60 mg daily for 7–10 days.

### *3. Central nervous system conditions*

#### *Referral*

- Electrophysiological studies may be needed in the diagnostic assessment, although many common causes do not warrant specialist investigations, e.g. polyneuropathies due to diabetes mellitus, HIV, isoniazid, hydralazine, dapson, antiretrovirals (stavudine and didanosine), amiodarone and alcohol. These cases may initially be managed locally, with referral of non-responding or atypical cases.
- Gullain-Barré Syndrome: referral criteria are progressive, extensive paralysis with impending respiratory failure, bulbar palsy and swallowing problems, and aspiration, as well as for diagnostic confirmation.

---

### 3.5.6 Acute Myelopathy

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#### *Description*

Patients present with a sudden onset of paraparesis, with associated sensory loss, i.e. a sensory level may be found.

Incontinence and autonomic instability may be present.

There are numerous causes for this condition and it is important to exclude neoplastic and infectious conditions, i.e. granulomas and abscesses, causing external compression of the spinal cord. Lesions, such as intervertebral disk prolapse, and mass lesions below the spinal cord may present with cauda equina syndrome. These cases usually have asymmetrical weakness, but may have saddle anaesthesia and sphincter involvement alone. Incontinence is a marker of severity.

**Note:** Do not perform a lumbar puncture, until obstructive lesions of the spinal cord have been excluded clinically or radiologically.

#### *Referral*

- All patients for urgent imaging.

---

### 3.5.7 Multiple Sclerosis

---

#### *Description*

A demyelinating disease of the central nervous system, characterised by episodes of unifocal or multifocal neurological dysfunction. Diagnosis is confirmed by imaging. The CSF may show oligoclonal bands and raised IgG index.

Recovery between acute flares of illness is common, although a general stepwise degeneration in baseline is usually found.

Consult with neurologist/specialist for diagnosis and treatment.

#### *Referral*

- All patients.

---

### 3.5.8 Oedema, Cerebral

---

#### *Description*

Swelling of brain parenchymal tissue, due to vasogenic, cytotoxic and osmotic causes. Only the vasogenic causes, such as brain tumours and inflammation, respond to corticosteroids.

Consider mannitol for brain oedema in traumatic brain injury causing raised intracranial pressure, pending neurosurgical intervention.



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### 3.5.9 Brain Oedema Due to Tumours and Inflammation

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#### *General Measures*

Supportive management.

#### *Treatment*

Treat the underlying cause. This is especially important with brain oedema associated with systemic conditions, such as electrolyte disturbances and organ failure. Patients with primary brain tumours or brain metastases should be considered for specific treatment of the tumour, which includes surgery and/or radiotherapy.

- Give **Dexamethasone**, IV, 4 mg 6 hourly, initially.

OR

- Give **Betamethasone**, oral/IV, 4 mg 6 hourly. Discontinue if no response has occurred after 48 hours. Taper dose according to response and duration of therapy.

---

### 3.5.10 Brain Oedema Due to Traumatic Injury

---

#### *General Measures*

Refer patient for neurosurgical opinion, if indicated. Supportive management.

### *3. Central nervous system conditions*

**Note:** DVT prophylaxis with heparin may be contraindicated owing to risk of increased bleeding.

The following measures should be used in patients with raised intracranial pressure:

- head elevation and position,
- airway and ventilation control,
- sedation and analgesia,
- control of fever,
- control of hypertension, and
- prevention of seizures.

Currently, no evidence supports the use of hyperventilation in this setting.

#### *Treatment*

For raised intracranial pressure, pending neurosurgical procedure only:

- Give **Mannitol** 15–25%, IV, 0.25–1 g/kg administered over 30–60 minutes. Monitor neurological response and urine output. Do not repeat more than 6–8 hourly. Beware of hypovolaemia and electrolyte disturbances, especially hypokalaemia.

Currently no evidence exists to support the use of hypertonic saline infusion.

Corticosteroids used in this setting have a harmful effect.

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## 4.0 Ear Nose and Throat Conditions

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### 4.1 Mastoiditis Secondary to Acute or Chronic Otits Media

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*Symptoms and signs:*

- Swelling behind or above the ear.
- Fever, Pinna pushed forward, tender

*Treatment:*

*Adults:*

- Give **Ampicillin** 1g every 8 hourly for 5 days plus
- Give **Flucloxacillin** 500mg IM or IV, 6 hourly for 5 days plus
- Give **Metronidazole** 500mg IV, 8 hourly for 5 days
- Give **Analgesics** as necessary

*Alternatively:*

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

*Children:*

- Give **Ampicillin** 25 – 50mg/kg IM or IV q8h for 5 days

## 4. Ear Nose and Throat Conditions

### *Red Flags:*

- Watch for complications of brain involvement (meningitis or brain abscess).
- Surgical drainage may be necessary (If fluctuant)
- Refer patient to hospital (if no response to drugs)

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## 4.2 Otitis

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### 4.2.1 Otitis Externa

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

### *Symptoms and signs:*

- Ear pain, hearing loss

### *Treatment:*

#### **(a) Furuncle**

- Give **Analgesia**
- Give **Flucloxacillin** 500mg qid for 5 days

### *Alternatively*

- Give **Cloxacillin** 500mg qid for 5 days

#### 4. Ear Nose and Throat Conditions

- Make a wick of ribbon gauze impregnated with **Hydrocortisone** or **Betamethasone cream** and gently insert in the ear for 2 to 3 days.

##### **(b) Diffuse Otitis Externa**

- Give **Analgesia** when necessary
- Dry mop the ear
- Give **Acetic acid** ear drops 2% in Alcohol q6h for 5 days

---

#### **4.2.2 Acute Otitis Media (Children)**

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- 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 and Signs:*

- Fever in about 50% of patients, sudden persistent ear pain or pus discharge for < 2 weeks

##### *Treatment:*

- Give **Amoxicillin** 15 mg/kg tds for 5 days

#### 4. Ear Nose and Throat Conditions

##### *Alternatively:*

- Give **Erythromycin** 6.25 mg/kg tds or **Azithromycin** 10mg/kg stat the 5mg/kg od for total maximum 5 days for patients with penicillin allergy
- Give **Analgesia** as required
- Pus discharge from the ear for over 2 weeks

##### *Symptoms and signs:*

- Persistent pus discharge, hearing loss
- 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 always dry by dry wicking with cotton wool.

**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 q6h for 5 days or where available Ciprofloxacin/Chloramphenicol ear drops.

#### *4. Ear Nose and Throat Conditions*

- 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 or cotton wool into a wick and insert carefully into the patient's 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
  - Commercially made ear buds should be avoided in cleaning the ear
  - The patient should avoid swimming or otherwise getting the inside of the ear wet

#### 4. Ear Nose and Throat Conditions

- 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, condition is common in HIV infected children

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### 4.3 Nose Conditions

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#### 4.3.1 Epistaxis

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- Bleeding from the nose
- Bleeding can be bilateral or unilateral, or posterior and anterior
- Causes include trauma, repeated nose pickings, infections such as rhinosinusitis, systemic causes such as hypertension, bleeding disorders, anaemia and leukaemia 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



#### 4. Ear Nose and Throat Conditions

or

- Apply nasal packs soaked in **Adrenaline**
- Note:** Avoid use of adrenaline in hypertensive patients
- If bleeding continues, refer to hospital

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#### 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:*

- Give **Analgesia**
- Give **Amoxicillin** 500mg tds for 5 days and
- Give **Liquid Paraffin** 2 drops each nose 3 times a day

---

#### 4.3.3 Sinusitis

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

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### 4.3.3.1 Bacterial Sinusitis

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*Symptoms and 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:*

- Give **Oxymetazoline** 0.05% 2 drops twice a day for not more than one week
- Give **Cetirizine** 10mg daily for 3-5 days
- Give **Amoxycillin** 500mg tds for 5 days
- Steam inhalations using **Menthol** are advised

*Children:*

- Give **Oxymetazoline** 0.025% 2 drops twice a day for not more than one week

#### 4. Ear Nose and Throat Conditions

- Give **Amoxicillin** 25 mg/kg/dose in exacerbations of chronic sinusitis and HIV positive children who are on Cotrimoxazole prophylaxis.

*Alternatively if penicillin hypersensitivity:*

- Give **Erythromycin** 12.5 mg/kg/dose qid or **Azithromycin** 10mg/kg stat then 5mg /kg od for 7 days

*If pain or fever:*

- Give **Analgesic/Antipyretic** treatment as required

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#### 4.3.4 Allergic Rhinitis

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- 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.

#### 4. Ear Nose and Throat Conditions

##### *Treatment:*

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

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#### 4.3.5 Pharyngitis

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- Viral pharyngitis is 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
- Homemade salt mouth washes or gargles for 1 minute twice daily

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#### 4.3.6 Tonsillitis

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

##### *Symptoms and Signs:*

- Sore throat, difficulty and pain on swallowing, inflamed tonsils, multiple white spots on the tonsillar surface, and sudden onset of fever.

#### *4. Ear Nose and Throat Conditions*

##### *Treatment:*

- Warm salt gargles
- Give **Amoxicillin** 500mg tds for 7 days

##### *Alternatively:*

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

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## **4.4 ENT Emergencies**

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### **4.4.1 Foreign Body Inhalation**

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##### *Symptoms and Signs:*

- Drooling in saliva especially in children
- Signs of upper airway obstruction such as Difficulties in breathing, stridor, use of accessory muscles to breathe, painful swallowing.

##### *Treatment:*

- Refer for surgical review
- Retropharyngeal Abscess to be under here

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## 5.0 Emergencies

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Note: Initial Trauma Management: For all emergencies and trauma, the following format should be applied in management (ABDCE):

- A – Airway
  - Jaw thrust, Guedel airway, immobilize C-Spine
- B – Breathing
  - RR, O2 Therapy, Respiratory exam
- C – Circulation
  - BP and HR, IV access (use green or grey cannula in adults)
- D – Disability
  - AVPU or GCS (see table below)
- E – Exposure
  - Examine the rest of the body (Head to toe)
  - Don't forget to check Glucose if able to
  - For suspected Fractures, aim to immobilize, sterile compress and give analgesics before referral.

**RED FLAG:**

- Open fractures, fractures of the long bones or pelvis.
- Risk of bleeding
- TTV for open fractures

## 5. Emergencies

<b>GCS TABLE</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Motor</b>	Unresponsive	Extension to pain	Flexion to pain	Withdraws from pain	Localizes pain	Obeys commands
<b>Verbal</b>	No sounds	Incomprehensible sounds	Words but no conversation	Confused conversation	Comprehensive speech	
<b>Eye</b>	No eye opening	Opens to Pain	Opens to voice	Opens spontaneously		

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## 5.1 Shock

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

### *Causes*

- Hypovolemic (haemorrhage, cholera, severe vomiting, diabetic ketoacidosis)
  - Cold, clammy skin; weak pulse, tachycardia
- Cardiogenic (myocardial infarction)
  - Signs of heart failure
- Obstructive (pericardial tamponade, tension pneumothorax)
  - Raised JVP, pulsus paradoxus
  - 4 distributive (sepsis, anaphylaxis)
  - Fever, warm peripheries

---

### 5.1.1 Anaphylaxis (anaphylactic shock)

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- 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



## 5. Emergencies

- It is most commonly precipitated by drugs, especially after parenteral administration including:
  - Antibiotics
  - Aspirin and other Non-Steroidal Anti-inflammatory Drugs (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

### *General Measures:*

- **Adrenaline** IM is a priority
- Determine and remove cause
- Lie the patient down
- Keep the patient warm
- Elevate the patient's legs
- Maintain airway
- Give 100% oxygen if available

## 5. Emergencies

### Treatment:

- Give **Adrenaline** 0.01 ml/kg
- Repeat as required (several times if necessary) every 10 minutes according to BP and pulse until improvement occurs
- Give **Sodium Chloride** 0.9 % 20 mL/kg by IV 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
- Give **Promethazine** 25-50 mg by deep IM or , in emergencies, *slow IV*, 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 IV 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:

- Give **Hydrocortisone** 200 mg by *slow IV* push

## 5. Emergencies

### Children:

< 1 year: 25 mg

1-5 years: 50 mg

6-12 years: 100mg

- 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:
- Give **Aminophylline** IV as for asthma if bronchospasm persists (*see Section 16.2.1*)
- Ventilation and/or tracheotomy *If acidosis is severe (blood pH<7.1) after 20 minutes*

### Treatment

- Give **Sodium Bicarbonate** 50 mmol by *slow* IV (appr. 100 mL of 4% solution)
- Monitor plasma pH

---

## 5.2 Management of Emergencies and Trauma in Children

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- 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, severe pallor, 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:

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- 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.*

## 5. Emergencies

- Manage airway in choking by using back slaps, chest thrusts or Heimlich manoeuvre in an older child.
- If there is 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 diarrhoea

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### 5.3 Management of convulsions in children

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- 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 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*

*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

## 5. Emergencies

G- Glucose (correct **Hypoglycaemia** with  
2ml/kg of 25% **Dextrose** or  
2.5ml/kg of 20% **Dextrose** or 5ml/kg  
of 10% **Dextrose**)

### **Diazepam**

0.5mg/kg rectal or 0.25mg/kg IV

If the fit has been going on more than 5 minutes

**Diazepam** 0.5mg/kg rectal or  
0.25mg/kg IV



If fit still ongoing after 10 minutes or has recurred



If fit still ongoing after 10 minutes or has recurred



If fit still ongoing after further 10 minutes or

## 5. Emergencies

**Paraldehyde** 0.2ml/kg IM or 0.4ml/kg rectal

**Diazepam**

0.5mg/kg rectal or 0.25mg/kg

has recurred, inform senior health worker



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



### Note:

- It is not recommended to give Diazepam intramuscularly
- Rectal administration may be quicker and easier than IV in fitting child. Use a syringe with the needle removed.
- 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)



- For neonates, use **Phenobarbitone** 15-20mg/kg loading dose and maintenance dose of 2.5-5mg/kg once daily.

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#### 5.4 Diabetic Ketoacidosis (DKA)

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- 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

## 5. Emergencies

- 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 IV fluids are stopped

**Note:** Do not give **Potassium Chloride** with the first litre of Sodium Chloride instead.

- Give 10U **Soluble Insulin** IV stat, thereafter give **Insulin** IV according to sliding scale every 2 hours
- Check blood sugar every 2 hours
  - Give IV **soluble Insulin** and only change to sc if patient is well hydrated

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### 5.5 Hyperosmolar non-ketotic coma (HONK)

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

*Signs and Symptoms:*

- 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** IM 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*
- Adjust / individualize insulin treatment when fully conscious and eating

## 5. Emergencies

### Sliding scale for insulin dosage based on blood sugar taken 2 hourly (see table below)

<b>Blood Glucose</b>	<b>Dose soluble insulin (IM)</b>	<b>Type of fluid</b>
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	Sodium chloride 0.9%
<200mg /dL (11mmol/L)	5 units	Dextrose 5%

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## 6.0 Endocrine Disorders

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### 6.1 Diabetes Mellitus

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- 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 or HbA1C >6.5% ) 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
- 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

## 6. Endocrine disorders

### *Refer for specialist opinion if:*

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

**Note:** Suspect Diabetes Mellitus in an adult with foot ulcer not healing for long time; vaginal candida; blurred vision even without typical symptoms and signs of Diabetes Mellitus. All diabetic clinics should have access to HbA1C test.

### *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** IV even if a blood glucose measurement is not available.

**Note:** Do not rush to refer the unconscious Diabetic mellitus before you consider managing hypoglycaemia for hypoglycaemia can cause sudden death than hyperglycaemia.

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### 6.1.1 Diabetes Type 1 (Insulin dependent)

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

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#### 6.1.1.1 Adults with no ketoacidosis or other acute complication

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*Treatment:*

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

**Note:** For proper management of diabetes mellitus refer to Clinical handbooks of QECH College of Medicine and KCH Intern Logbook as well as Pediatric handbook

- 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

## 6. Endocrine disorders

- Adjust Insulin dose according to fasting blood sugar (FBS) or 2 hours post-prandial blood sugar or symptoms of hypo- or hyperglycaemia
- Give **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

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### 6.1.1.2 Children with Diabetic Ketoacidosis

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#### *Signs and symptoms:*

- Vomiting, polyuria, dehydration, ketonuria and acidosis. The blood sugar will be high >15mmol/l



## 6. Endocrine disorders

### Treatment:

- Address airway and breathing
- IV fluids are the most important resuscitation measure
- Give **Normal Saline** or **Ringers Lactate**
- Give 10mls/kg bolus and repeat to a maximum of 30mls/kg to correct shock if present
- Ongoing fluid requirement = (Maintenance) plus (Deficit) minus (shock bolus)
- **CORRECT OVER 48HRS TO AVOID CEREBRAL OEDEMA**

**Note:** Child is usually approx. 7.5 to 10 % dehydrated. Deficit is calculated as % body weight loss. Maintenance is calculated as per shown below

Maintenance 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.

*For example:*

- Comatose child weighing 20kg on admission in shock in DKA X 10ml/kg bolus needed to correct shock = 2 X 200 = 400mls
- Maintenance is 1.5L/ day (1000mls +500mls)

## 6. Endocrine disorders

- Deficit=  $20\text{kg} \times 7.5\% = 1.5\text{L}$  (one litre weighs 1kg)
- Requirement over 48 hours
- Maintenance  $(1.5 + 1.5\text{L}) + \text{deficit}(1.5\text{L})$  minus bolus (400)  $4.1\text{L} + /48\text{hours} = 85\text{ml/hr}$
- Add KCl to IV fluids when patient urinates and peripheral circulation has improved.
- Change to oral K+ supplements when patient is able to feed.
- ECG monitoring if potassium is  $<2.8$  or  $>6\text{mmol/L}$

### Give Insulin

- Should be short acting, soluble
- Start insulin one hour after starting IV fluids
- start with small subcut dose of  $0.1\text{u/kg}$ . Recheck blood glucose after an hour.
- If glucose is unchanged or increased, repeat subcut dose of  $0.1\text{u/kg}$ . Repeat hourly until blood glucose starts falling.

### Sliding Scale:

- Blood glucose (mmol/L)
- $>20$  :  $0.5\text{u/kg}$
- $15 - 19.9$  :  $0.4\text{u/kg}$
- $10 - 14.9$  :  $0.3\text{u/kg}$
- $5 - 9.9$  :  $0.2\text{u/kg}$
- $- 4.9$  :  $0.1\text{u/kg}$  only if on a glucose drip
- $<2$  : omit Insulin and give Dextrose or food

*Ongoing Management:*

- Change IV fluid to 1/2 strength **Darrows** or 5 % **Dextrose** if blood glucose < 15mmol/L
- IV fluids must be continued until child is drinking well, tolerating oral feeds and has ketone free urine
- Monitor level of consciousness.  
Deteriorating neurological state may indicate cerebral oedema. Ensure airway is protected
- Consider NGT on free drainage if child is unconscious.
- Check each urine passed for glucose and ketones as a guide to recovery
- Maintenance **Insulin** requirements
  - Once child is drinking and eating
  - Calculate total daily dose of insulin once the child is stable. This is usually 0.5 to 1u/kg/day, but should be based on the **Insulin** requirement of the previous 24hours.
- If only short acting Insulin is available:
  - Continue tds regime prior to meals according to requirement
- If long acting is available:
  - BD regime, 2/3 of the total dose should be given before breakfast and 1/3 before dinner
  - Proportion for long acting and short acting should be about 2:1 to 3:1
- Educate patient and family on diet:
  - Importance of regular meals

## 6. Endocrine disorders

- Avoid refined sugars eg SOBO, bananas, cakes and biscuits
- Encourage complex carbohydrates eg cereals and a high fibre diet
- Educate patient and family on **Insulin**:
  - Keep in a cool place e.g clay pot if no refrigerator
  - Rotation of injection sites
  - How to give injections

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### 6.1.2 Hypoglycaemia

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#### *Symptoms and signs:*

- Sweating
- Trembling
- Tachycardia
- Drowsiness
- Confusion

#### *Treatment:*

- Glucose in form of refined sugars eg SOBO
- Follow up
  - Attend monthly clinics at hospital- blood glucose and/or urine should be checked
  - Check injection sites
  - Ask about nocturia.
  - HbA1c can be measured
  - Diabetic patients should have the following annually: fundoscopy, urine microalbuminuria and thyroid function tests if available.

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### 6.1.3 Diabetes type 2 (Non Insulin-Dependent)

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- 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 the above is unsuccessful, then:

*Treatment:*

- Give **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 1 diabetes to initiate treatment. Use **Lente** 0.3U/kg bodyweight to start with.

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## 6.2 Thyroid Disorders

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### 6.2.1 Hyperthyroidism

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*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:*

- Give **Propranolol** 40-120mg tds to control symptoms, especially tachycardia
- Give **Carbimazole** 40mg od 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

## 6. Endocrine disorders

### Children:

- Give **Carbimazole** 0.5 mg/kg od po
- Give **Atenolol** 1-2 mg/kg od orally

### 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:

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

---

### 6.2.2.1 Congenital Hypothyroidism

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- 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 impairment.

*Signs and symptoms:*

- Prolonged jaundice, feeding difficulties, hypotonia, wide open fontanelles, oedema, constipation, enlarged tongue, dry skin, bradycardia, lethargy etc.

*Treatment:*

- Give **Levothyroxine** 10-15 mcg/kg od orally for neonates and infants and 100 mcg/kg od
- 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.



## 6. Endocrine disorders

### *Prophylaxis:*

- Give **Aqueous Iodine Oral Solution**  
130mg/ml single dose
- Repeat every 2 years

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## 7.0 Gastro-Intestinal Conditions

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### 7.1 Amoebiasis

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

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#### 7.1.1 Intestinal (Non-Invasive) Form

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*Treatment:*

*Adults:*

- Give **Metronidazole** 800mg tds for 5 days preferably after food

*Children:*

- Give **Metronidazole** 7.5 mg/kg tds for 5 days

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#### 7.1.2 Hepatic Form (Amoebic Liver Abscess)

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*Treatment:*

- Give **Metronidazole** 800mg tds for 10 days
- Give orally (preferably after food) or IV (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.

## 7. Gastro-Intestinal Conditions

### Children:

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

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## 7.2 Bacillary Dysentery

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- 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:

- Give **Ciprofloxacin** 500 mg bd for 5 days
- Analgesic

#### Children > 3 months:

- Give **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. The patient 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:*

- Give **Doxycycline** 300 mg stat

*Alternatively in pregnancy and children <5years:*

- Give **Erythromycin** 250 mg qid for 3 days

*Children >5 years:*

- Give **Erythromycin** 12.5 mg/kg qid for 3 days

## 7.4 Constipation

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- 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.
- Do not use oral laxatives in children. **Glycerine** infant and pediatric suppositories can be used in the short term.
- 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 especially if there is abdominal distension and/or vomiting

**Note:** All laxatives are contraindicated if intestinal obstruction is suspected

## 7. Gastro-Intestinal Conditions

*Treatment:*

*Adults:*

- Give **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

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### 7.5.1 Acute Diarrhoea

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- 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 bd may be considered if the patient is (suspected to be) HIV infected
- In children, if IV fluid is indicated but is impossible to administer, consider using the intra-osseous 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 diarrhoea

---

- Only use antibiotics for dysentery and suspected cholera cases with severe dehydration
- >6 month: Give **Zinc** 20mg per day for 10 days
- <6 month: Give **Zinc** 10mg per day for 10 days 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

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



**7.5.1.2 Assessment of patients for dehydration**

			<b>A</b>	<b>B</b>	<b>C</b>
1.	Look at:	Condition	Well, alert	Restless, irritable	Lethargic, unconscious, floppy, very weak
		Eyes	Normal	Sunken	Sunken and dry
		Tears	Present	Absent	Absent
		Tongue	Moist	Dry	Dry
		Mouth	Drinks normally	Dry	Dry
		Thirst	Not thirsty	Thirsty	Very thirsty
2.	Feel:	Skin Pinch	Goes back quickly	Goes back slowly	Goes back very slowly
3.	Decide:		No sign of dehydration	If the patient has 2 or more signs including at least one sign*: SOME	If the patient has 2 or more signs including at least one sign*: SEVERE
4.	Treat (see below)		Use Plan A	Weigh if possible Use Plan B	Weigh if possible Use Plan C

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

### 7.5.1.3 Treatment Plan A (to treat diarrhoea 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
    - 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 IV route for rehydration except in cases of shock.
- In shock give oxygen, keep the child warm, establish IV access and infuse 15mls/kg over 1 hour of  $\frac{1}{2}$  **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 IV 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 **ReSoMal** 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.

### Ingredients for home made ReSoMal

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

## 7. Gastro-Intestinal Conditions

### 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 type of 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 of the following:

- many watery stools
- repeated vomiting
- marked thirst
- eating or drinking poorly

## 7. Gastro-Intestinal Conditions

- fever
- 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 <b>ORS</b> to give after each loose stool*	Amount of <b>ORS</b> to provide for 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

## 7. Gastro-Intestinal Conditions

### **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 diarrhoea 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

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**7.5.1.4. Treatment Plan B (to treat dehydration)**

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**1. Give ORS solution for the first 4 hours:**

<b>Weight (kg)</b>	<b>Amount (mL)</b>
Under 5	200-400
5-	400-600
8	600-800
8-	800-1,200
11	1,200-
11-	2,200
16	2,200-
16-	4,000
30	

- 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)
- check from time to time to see if there are any problems



## 7. Gastro-Intestinal Conditions

*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**

## 7. Gastro-Intestinal Conditions

*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)

---

#### **Start IV fluids immediately**

- If patient can drink, give **ORS** by mouth while the drip is set up
- **Intra-osseus route:** if unable to get an IV 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 doses  
*(See Rate of Administration of IV Rehydration Fluid Table below)*

## 7. Gastro-Intestinal Conditions

### *Alternatively if not available*

- **Normal saline**

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

### **Rate of administration of IV rehydration fluid**

Age	First give 30 ml/kg	Then give 70ml/kg
<12 months	1 hour *	5 hours
>12 months	30 minutes*	2 <sup>1</sup> / <sub>2</sub> hours

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

### ***Alternative method of IV rehydration fluid administration***

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

### *With either method:*

- reassess the patient every 1-2 hours

### *If hydration is not improving:*

- give the IV 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)

## 7. Gastro-Intestinal Conditions

- 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 IV therapy cannot be given, but is available within 30 minutes and the child can take fluids orally:*

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

*If IV therapy cannot be given and is not available, 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

## 7. Gastro-Intestinal Conditions

*If hydration is not improving after 3 hours:*

- refer for IV therapy
- reassess after 6 hours
- choose the appropriate treatment plan to continue treatment

*If both IV 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 IV and nasogastric therapy are not available and the patient cannot drink:***

- refer *urgently* for IV 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 after the patient is alert

---

### 7.5.2 Chronic Diarrhoea (Adults)

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- Defined as LOOSE 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**
- Advise 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

## 7. Gastro-Intestinal Conditions

*If improved after re-treatment:*

- Follow up as required

*If still no response after adding Metronidazole or if there is 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

*If bacteria or parasite found;*

- Treat accordingly

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

- Re-evaluate

*If bacteria or parasite is not found, use a constipating agent to control the diarrhoea for up to 5 days treatment*

- Give **Loperamide** 4mg initially then 2mg after each loose stool
- Usual dose 6-8mg daily up to 16mg daily

## 7. Gastro-Intestinal Conditions

### *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 yellow paraffin 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

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### **7.5.3. Persistent diarrhoea (children)**

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- 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



## 7. Gastro-Intestinal Conditions

- 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 give:*

- **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 Dyspepsia

---

- Meal related non-specific abdominal discomfort and pain

### *General measures:*

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

### *Treatment:*

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

### *Alternatively:*

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

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## 7.7 Peptic Ulcer Disease/Gastritis

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- Commonly caused by *Helicobacter pylori*

### *Treatment (Triple Therapy):*

- Give **Omeprazole** 40mg once daily for 2 weeks
- Give **Metronidazole** 400mg every 8 hours for 7 -10 days
- Give **Amoxicillin** 1g every twelve hours for 7 – 10days

### *Alternatively:*

- Give **Omeprazole** 20 mg twice daily for 2 weeks
- Give **Metronidazole** 400mg every eight hours for 7-10 days
- Give **Clarithromycin** 500mg twice daily for 7-10 days

### *Red Flag:*

- Refer for endoscopy and further management if ongoing pain and alarm symptoms
  - Weight loss, Haematemesis and signs and symptoms of gastric outlet obstruction

**Note: Aspirin** and other non-steroidal anti-inflammatory drugs (NSAIDS) e.g.

**Indomethacin, Ibuprofen**, are contraindicated in patients with a history of peptic ulcer

## 7.8 Vomiting

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- 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:*

- Give **Metoclopramide** 10 mg IM or slow IV (over 2 minutes) 3 times daily as required

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

### *Children:*

- All children with profuse vomiting must be admitted for hydration, observation and investigation. When a guardian comes back with a child who is still vomiting, admit or refer the child. Do not send them home.

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## 8.0 Hepatic Disorders

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### 8.1 Acute liver failure

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- Withdraw the causative agent if possible e.g. drugs or alcohol
- Avoid hepatotoxic drugs e.g. **Paracetamol**
- Ensure adequate intake of **Glucose (Dextrose)**
- Induce diarrhoea with **Lactulose** 5ml every 6 hours and/or **Neomycin Sulphate** 1g q6h (1 week)
- Give antibiotic prophylaxis for patients with liver failure: **Ceftriaxone** 2g od IV

*Alternative:* Give **Ampicillin** 1 g q8h

Prophylaxis of bleeding: **Vitamin K** 10 mg IM stat

*If the patient is drowsy or comatose*

- Give an IV infusion of **Dextrose** 50%
- Reduce protein intake
- Do not give sedatives or hypnotics
- Refer the patient for further diagnosis and management
- Give **Thiamine** 100 mg IV or IM 3-7 days in case of known or suspected alcoholic cause

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## 9.0 Infectious Diseases

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### 9.1 HIV and related conditions

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- 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 guidelines:*

- MoH Management of HIV/AIDS Related Diseases (2008 2<sup>nd</sup> Edition)
- 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 3<sup>rd</sup> edition.
- PMTCT guidelines

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#### 9.1.1 Care and Support

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*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.

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**9.1.2 Immunisation of HIV (+) children**

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- Unless very ill, immunise with EPI vaccines (BCG, DPT, polio and measles) according to standard schedules
- 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.

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**9.1.3 Breast-feeding by HIV (+) mothers**

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- Counsel HIV (+) women on the risks of future pregnancy
- Encourage Exclusive breast feeding up to 6months and may continue breastfeeding up to 2 years of age.
  - All lactating mothers must be fast tracked to start HAART if not yet on treatment. Refer to Option B+ on PMTCT guidelines.

#### **9.1.4 End Organ Dysfunction**

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- These include:
  - Bone marrow (haematological abnormalities): see section on blood diseases
  - Central Nervous System, Gastrointestinal, Renal, Cardiac Systems
- For organ dysfunction directly caused by HIV, ART is indicated in combination with supportive treatment

---

#### **9.1.5 Counselling**

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- 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**

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

#### **9.1.5.2 Post-test counselling**

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

#### **9.1.6 Health worker safety**

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

#### **9.1.7 Post-Exposure Prophylaxis (PEP)**

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- PEP involves giving ARV's following possible exposure to HIV to prevent infection

## 9.0 Infectious Diseases

- Situations where PEP should be considered:
  - Rape/sexual assault: women, men and children
  - Needle/sharps injury: usually health care workers
  - Multiple major trauma: eg. road traffic accident involving multiple passengers
  - Condom failure: especially if partner known to be infected

### *General Principal:*

- The first dose should be given ***as soon as possible*** after exposure - the sooner it is given, the more likely it is to prevent infection
- There is likely to be no benefit in giving PEP more than 72 hours after exposure
- Patients should receive a baseline rapid HIV test to confirm they are not already HIV positive
- However, **if testing is not immediately available, the first dose can be given prior to testing to avoid delay**
- If a patient is found to be HIV positive, PEP should not be initiated and they should be referred to an HIV clinic for ongoing care
- When the HIV status of the source is not known (usually the case in rape) they should be assumed to be HIV positive.

## 9.0 Infectious Diseases

- When the source is known (for example a hospital inpatient) even if they are HIV negative, PEP may be given if there is a possibility that they may be in the window period.

### PEP Regimens:

- Adults and children >35kg:

1<sup>st</sup> choice:

Drug	Dose	Frequency	Duration
<b>TDF/3TC</b>  <b>Tenofovir 300mg/Lamivudine 150mg</b>	One tablet	Once daily	30 days

- Acceptable alternative if TDF/3TC not available:

Drug	Dose	Frequency	Duration
<b>AZT/3TC</b>  <b>Zidovudine 300mg/Lamivudine 150mg</b>	One tablet	TWICE daily	30 days

**Children <12 years of age:**

The paediatric formulation of AZT/3TC BD (Zidovudine 60mg/Lamivudine 30mg) is used twice daily, the dosing is dependent on weight:

<b>Weight band</b>	<b>Number of tablets BD</b>
<6kg	1
6 to <10kg	1 ½
10 to <14kg	2
14 to <20kg	2 ½
20 to <25kg	3
25 to <35kg	Use <b>adult</b> AZT/3TC 1 tablet BD
>35kg	Use <b>TDF/3TC</b> (see adults)

## 9.0 Infectious Diseases

### *For cases of rape:*

- Always offer emergency contraception *as soon as possible* to girls and women of reproductive age, unless protected by a reliable form of contraception.

<b>Contraceptive drug</b>	<b>Immediately</b>	<b>After 12 hours</b>
Postinor-2	2 tablets	-
Lo-Feminal or Microgynon	4 tablets	4 tablets

- Always offer presumptive treatment for STI's, though this is less urgent than PEP and emergency contraception, and can be deferred (particularly the oral drugs) for a few days if necessary.

Drug	Child <15 years	Adult
Benzathine Penicillin	50,000 IU/Kg IM stat	2.4 mega unit IM stat
Gentamycin	7.5mg/kg IM stat	240mg IM stat
Erythromycin	12.5mg/kg QDS 7 days	500mg QDS 7 days
Metronidazole	5mg/kg TDS 7 days	400mg TDS 7 days

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### 9.1.8 HIV infection in children

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- *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 12 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

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- 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

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See *Section 7.5*

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#### 9.1.9.2 Respiratory Conditions (Adults)

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- *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:*

- Give **Cotrimoxazole** po or IV 30 mg/kg q8h for 21 days
- Wherever possible give oxygen
- Give severely dyspnoic patients **Prednisolone** 40mg bd for 5 days then 40mg od for 5 days then 20mg od 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: exclude malaria (see Section 15.1)
  - If URTI without fever: Advise mother on general supportive home care (see Section 16.1)
- If Pneumonia suspected: assess severity and treat accordingly



## 9.0 Infectious Diseases

- 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 interstitial 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
  - Give **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<sup>o</sup> 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*)
- 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 1<sup>st</sup> line antimalarial treatment (*see Section 15.1.1*)
- 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

## 9.0 Infectious Diseases

- 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)

*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 degrees 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

## 9.0 Infectious Diseases

### *Treatment:*

#### *Seriously ill child:*

- Start treatment for presumed sepsis (see Section 9.7)
- Start 1<sup>st</sup> line antimalarial treatment (see Section 15.1.1)
- Refer the patient.

#### *Child not seriously ill:*

#### *If the child has completed 1<sup>st</sup> line antimalaria treatment:*

- Give **Amoxicillin 15mg/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 Amoxicillin
- Follow up as required.

#### *If not improved:*

- Give 2nd line antimalarial treatment (see Section 15.1.1)
- Follow up as required.

#### *If the child has not completed 1<sup>st</sup> line antimalarial treatment*

- Give 1st line antimalarial treatment (see Section 15.1.1)

## 9.0 Infectious Diseases

*If not free of fever after 3 days:*

- Refer to the next level

---

### 9.1.9.7 Upper GIT Candidiasis

---

- Presumptive diagnosis:
  - White plaques in the mouth and lesions in the esophagus and stomach
  - Antifungal therapy is required treat according to Oropharyngeal conditions (*see Section 14.1*)

---

### 9.1.9.8 Mental disorders (adults and older children)

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- Refer to *Chapter 25 on Mental Disorders*

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### 9.1.9.9 Primary neurological disorders (adults)

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- Refer for careful assessment and investigation
- Refer to Chapter 3 on Central Nervous System

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#### 9.1.9.9.1 CNS disorders

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- 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 lumbar 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

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#### 9.1.9.9.1.3 Cryptococcal Meningitis

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- Refer to *Section 9.3.3*

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#### 9.1.9.9.1.4 Tuberculosis

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- Refer to *Section 9.5*

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#### 9.1.9.9.1.5 Syphilis

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- Refer to *Section 17.4*

*If there is severe spasticity and ataxia:*

- Presume myelopathy
- Treat as neuro-syphilis with **Benzympenicillin 5 MU IV 6 hourly** for 2 weeks OR **Doxycycline 200 mg od** for 3 weeks

- Give supportive and symptomatic treatment and counseling

---

#### **9.1.9.9.1.6 AIDS Dementia**

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- 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)**

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- Caused by a polyomavirus (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.

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### 9.1.9.9.2 Peripheral Nervous System Conditions

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*If predominantly sensory: sensory peripheral neuropathy*

- If on tuberculosis treatment, treat with **Pyridoxine** 25mg od 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:
  - Give **Amitryptilline** 25-75mg nocte
  - Give painkillers if required (*see Section 24.1*)

---

### 9.1.9.10 Primary neurological disorders (children)

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- 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

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*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)

## 9.0 Infectious Diseases

*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*

*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)

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- 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 older child
- Tuberculin PPD testing is however usually unhelpful in severe FTT
- Identify any other associated problems and treat accordingly. These may include
  - Persistent Diarrhoea
  - Oral thrush
  - Respiratory conditions

## 9.0 Infectious Diseases

- 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

## 9.0 Infectious Diseases

*If not able to feed and moderately or severely malnourished:*

- Admit the patient
- Treat for malnutrition (see Section 23)

*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, use NGT feeding until able to take oral feeds*

*Once the child is improving*

- If anemic, 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

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### 9.1.9.13 Pain relief

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- Refer to *Section 24*

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## 9.1.10 Antiretroviral Treatment Regimens

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### 9.1.10.1 First Line regimen

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- 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

**Note: ART eligibility for patients diagnosed with HIV**

- All patients with HIV who are not already on ART should be assessed to determine if they require ART, and initiated or referred without delay.

**Universal eligibility, regardless of stage or CD4 count:**

- Pregnant/breastfeeding women
- Children <5 years of age

**Adults and children >5 years:**

- WHO Stage III or IV
- CD4 count <500

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**9.1.10.2 First line ART regimens**

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- **Adults and Children >35kg: regimen 5A**

Drug	Dose	Frequency
<b>TDF/3TC/EFV</b>		
Tenofovir 300mg/  Lamivudine 150mg/  Efavirenz 600mg	One tablet	Once daily

- **Children <35kg: regimen 2P**
- Regimen 2P consists of AZT/3TC/NVP (**Zidovudine 60mg/Lamivudine 30mg/Nevirapine 50mg**).

**Note:** NVP requires to be initiated once daily for the first two weeks to minimise toxicity. This is achieved by giving AZT/3TC in the morning and AZT/3TC/NVP in the evening for the first two weeks.

Weight band	Number of tablets bd AZT/3TC/NVP
<6kg	1
6 to <10kg	1 ½
10 to <14kg	2
14 to <20kg	2 ½
20 to <25kg	3
25 to <35kg	Use <b>adult</b> AZT/3TC 1 tablet bd
>35kg	Use TDF/3TC (see adults)

**Note:**For detailed guidance on the management of adverse reactions to ART, diagnosing and managing treatment failure and switching to second line therapy, please refer to the ***Malawi Integrated HIV Guidelines***.

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### 9.1.11 Cotrimoxazole Prophylaxis

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#### *Adults*

- Give **Cotrimoxazole 480mg bd** to any HIV infected person in WHO clinical stage II, III or IV; any person with a CD4 count <500 cells/mm<sup>3</sup> regardless 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**.

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## 9.2 Leprosy

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### 9.2.1 Multibacillary

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- 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



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### 9.2.1.1 MDT regimen for multibacillary leprosy

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- MDT regimen for multibacillary leprosy

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

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

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### 9.2.2 Paucibacillary

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- 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

### MDT regimen for paubacillary leprosy

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

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#### 9.2.3 Leprosy reactions

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

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##### 9.2.3.1. Severe reversal reaction; paucibacillary patients

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

## 9.0 Infectious Diseases

### Treatment

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

### 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

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### 9.2.3.2 Severe reversal reaction: multibacillary patients

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

*Treatment*

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

**Prednisolone regimen for multibacillary severe reversal reaction**

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

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**9.2.3.3 Severe type 2 reaction**

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- 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

**Prednisolone regimen for severe type 2 reaction**

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

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### 9.2.3.4 Acute Dapsone Allergic Reaction

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*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 depending on severity.

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## 9.3 Meningitis

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- Refer patient to hospital as soon as diagnosis is suspected

**Note:** A lumbar puncture is essential for diagnosis

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

*Treatment*

*Adults*

- Give **Benzyl Penicillin** 5MU IV or IM stat
  - Plus (if available) **Chloramphenicol** 1g IV stat

*Children*

- Give **Benzyl Penicillin** 100,000 units/kg IV or IM stat

## 9.0 Infectious Diseases

- Plus **Chloramphenicol** 25 mg/kg IV stat

### *Neonates*

- Give **Benzyl Penicillin** and **Gentamycin** IM or IV
- When a lumbar puncture cannot be done prior to referral, this should be done as soon as possible after admission

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### 9.3.1 Bacterial meningitis

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- In hospital, start an IV 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)*

- Give **Ceftriaxone** 2g IV q12h

#### *Alternatively*

- Give **Chloromphenical** 1g IV q6h
- Give **Benzyl penicillin** 5MU IV q6h

**Note:** use the alternative regime only when ceftriaxone is not available and evidence of culture and sensitivity of the invading organism to Chloramphenicol.

*Children*

- Give **Ceftriaxone** 100mg/kg IM or IV q24h for 7 days

*Alternatively*

- **Chloramphenicol** 25mg /kg IV q8h

*plus*

- **Benzylpenicillin** 100,000 IU/kg q6h IV/IM

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### 9.3.2 Meningitis in neonates

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- 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 **Benzylpenicillin** 100,000 units/kg q6h, initially slow IV or IM *plus* **Gentamycin** 2.5 mg/kg IM or IV q8h or **Gentamycin** 5mg/kg IM q24h if 1 week old neonate. Or **Gentamycin** 7.5 mg/kg q24h if over a week old neonate.

*Alternatively*

- Give **Ampicillin** 50 mg/kg q6h initially IV then later IM as an alternative to **Benzylpenicillin**

*If still febrile after 48 hours:*

- Add **Cefotaxime**



## 9.0 Infectious Diseases

- 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% IV** solution over 4-6 hours for 2 weeks if tolerated, followed by **Fluconazole** 400 mg od for 6 weeks and then 200 mg od lifelong.

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### 9.3.3 Cryptococcal Meningitis

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*Alternatively if available*

- **Fluconazole** 1200mg od po or IV q24h daily for 2 weeks, followed by **Fluconazole** 400 mg od for 6 weeks and then 200 mg od lifelong.

*Children*

- Give **Fluconazole** 12mg/kg for 10 weeks, then 10mg/kg ongoing. Therapeutic lumbar punctures may be indicated every 48 hours if any signs of increased intracranial pressure.

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### 9.3.4 Meningococcal Meningitis (Prophylaxis)

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

*Adults*

- Give **Ciprofloxacin** 500mg stat.

*Alternatively*

- Give **Doxycycline** 300mg stat

## 9.0 Infectious Diseases

### Children

- Give **Doxycycline** 6 mg/kg

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### 9.4 Tetanus

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- Immunization has significantly reduced the incidence of this

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#### 9.4.1 Adult Tetanus

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- 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*

- Give **Diazepam** 20 mg IM or IV  
**Chlorpromazine** 50 mg IM or IV given alternately q3h

### *Alternatively*

- Give **Diazepam** infusion 40 mg in one liter of IV dextrose or normal saline q6h to q8h

**Note:**

- Take care: respiratory depression may occur
- Dose sizes or frequencies of the above medicines can be increased if necessary to control spasms
- Give **Anti-tetanus serum** 20,000 units IV stat
- Give this after a test dose of 1,500 units s/c
- **Benzyl penicillin** 2 MU IV q6h every for 7 days
- Give **Metronidazole** 500 mg IV q8h or 400 mg tds for 7 days
- Give **Tetanus toxoid vaccination**: give the full course

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#### 9.4.2 Neonatal Tetanus

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*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

## 9.0 Infectious Diseases

### 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 IV fluids
- Maintain nutrition with expressed breast milk via an NGT
- Have a mucous extractor or other suction available
- Avoid IM injections as much as possible by use of alternative routes (e.g. NGT, rectal administration) where indicated
- Change from IM 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

- Give **Paraldehyde** 0.2 ml/kg IM or 0.4 ml/kg rectally (see note below) followed by **Phenobarbitone** 15 mg/kg loading dose stat initially then 10 mg IV plus 5 mg IM
- Continue with **Diazepam** 0.5 mg/kg by NGT or rectally (see note below)
- or slow IV and **Phenobarbitone** 5-10 mg/kg by NGT or IM
- Give these drugs alternatively every 3 hours
- Give **Anti-tetanus serum** 10,000 units IM or IV q6h for 5 days

Once spasms are controlled;

- Give **Phenobarbitone** 5-10 mg/kg od as maintenance dose

**Note:**

**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.

**Diazepam:** rectal administration (by syringe after removing the needle) is as reliable as IV and easier and safer to give.

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### 9.4.3 Tetanus Prevention

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- Promote **Tetanus Toxoid Vaccination (TTV)** in pregnant women and all women of child bearing age (*see Section 12.3*)
- Ensure adequate surgical toilet plus passive (ATS 1,500 units IM or S/C) and active (TTV) immunization after wounds, bites and burns

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#### 9.4.4 Tetanus Toxoid Vaccination (TTV)

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##### 9.4.4.2 Fully immunized but last booster >10 years ago:

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- Give one booster dose of **0.5 mL** S/C or IM

**Note:** 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)

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#### 9.5 Tuberculosis (TB)

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- For detailed information on the control and management of TB refer to the ***National Tuberculosis Control Programme Manual (MOH, 2012)***
- 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 and 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)

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- 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)

**Note: 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)
  - HIV positive patients can be successfully treated for TB

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### 9.5.1 Anti-Tuberculosis Medicines

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

#### ***Adult Formulations***

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

## 9.0 Infectious Diseases

- **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) :** **Ethambutol 400mg, Ethambutol 100mg**
- **H100 (isoniazid)** contains: **Isoniazid 100mg**

### **c) Injections**

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

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## **9.5.2. TB Treatment Regimens**

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### **9.5.2.1 Treatment Regimen 1 (for new patients)**

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#### ***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.



## 9.0 Infectious Diseases

- 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.

### **Dosages of FDC formulations**

<b>Adults</b>		
	<b>Initial phase (2 months)</b>	<b>Continuation phase (4 months)</b>
Body weight (in kgs)	[RZE] [R150/H75/Z400/E275] Number of tablets*	[RZE] [R150/H75] Number of tablets*
30-37	2	2
38-54	3	3
55-74	4	4
75 and over	5	5

<b>CHILDREN</b>			
Body weight in kg	Initial phase (2 months)		Continuation phase (4 months)
		[RZE] (R60/H30/Z150) Number of tablets or sachets*	E 1 0 0
<	1	1	
8-9	1.5		
10-14	2		
15-19	3		
20-24	4		
25-29	5		
<b>Re-adjust dose as body weight</b>			

### 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:**

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

**Treatment regimen 2**

<b>ADULTS</b>							
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	
<b>CHILDREN</b>							
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	[RHZ] Number of tablets per day	[E] Number of tablets per day	[RHZ] Number of tablets per day	[E] Number of tablets per day	[RH] Number of tablets per day	[E] Number of 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

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### 9.5.3. Tuberculosis Meningitis

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

#### 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**.

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#### 9.5.4 Medicine Resistant Tuberculosis (MRT)

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- Two types of medicine resistant TB:
- Primary resistance (resistance in newly diagnosed TB cases) and
- Secondary resistance (resistance in previously treated TB cases).
- Multi-Drug Resistant TB (MDR-TB) - resistant to both rifampicin and isoniazid.
- 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 **Amikacin**)

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##### 9.5.4.1 Treatment of Medicine-resistant TB

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- 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.

**MDR-TB Treatment Regimen**

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

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

- For details see **Guidelines for the Programmatic Management of Multi-medicine Resistant Tuberculosis in Malawi (MOH, 2012)**.

### 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.

#### Minor side effects not requiring treatment to be stopped:

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



**Major Side effects requiring treatment to be stopped:**

<b>Symptoms</b>	<b>Medicine</b>	<b>Management</b>
Deafness	Related to <b>Streptomycin</b>	Otoscopy to rule out other causes STOP <b>Streptomycin</b> if no other explanation.
Dizziness	If true vertigo and nystagmus, related to <b>Streptomycin</b>	STOP <b>Streptomycin</b> ; If just dizziness with no nystagmus, try dose reduction for one week, but if no better stop <b>Streptomycin</b> instead USE <b>Ethambutol</b> instead
Generalised reactions including shock, purpura	May be due to <b>Rifampicin, Pyrazinamide</b> and/ or <b>Streptomycin</b>	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 <b>Ethambutol</b>	Visual examination –seek clarification STOP <b>Ethambutol</b>
Vomiting ++/ confusion	Suspect drug-induced hepatitis	Urgent liver function tests (lfts) If lfts not available, STOP anti-tuberculosis medicines and observe.

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## 9.5.6 Complications of Tuberculosis and their Management

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### 9.5.6.1 Pulmonary Tuberculosis

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- **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.

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**9.5.6.2 Extra-Pulmonary Tuberculosis**

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- 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 &D.
- **Pericardial effusion:** heart failure. Give high doses of steroids.
- **Cardiac tamponade (distress associated with shock).** Refer to tertiary level.
- **Pleural effusion:** 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.

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## 9.5.7 Use of Anti-Tuberculosis Medicines in Special Situations

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### 9.5.7.1 Pregnancy and Reproductive Health

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- **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**.

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### 9.5.7.2 Renal impairment and renal failure

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

**Note:**

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

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### 9.5.7.3 Liver impairment and liver failure

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- **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.

**Liver impairment with or without jaundice has a wider differential in patients on TB treatment**

**DIFFERENTIAL DIAGNOSIS**

<b>Potential causes</b>	<b>Clinical clues and investigations</b>
<b>TB IRIS in liver</b>	<b>2-4 weeks after ART</b> <b>Fever, tender hepatomegaly</b> <b>Disproportionate rise in ALP/GGT</b> <b>± jaundice</b>
<b>Viral hepatitis</b>	<b>Hep B,C and A</b>
<b>Alcohol or alternative remedies</b>	<b>History</b> <b>Signs of chronic liver disease</b>
<b>Sepsis associated cholestasis</b>	<b>Fever, clear source of infection, cholestasis without tender hepatomegaly</b>
<b>Acute cholangitis</b>	<b>Jaundice, right upper quadrant pain, obstructed biliary tree ± stones</b>
<b>HIV cholangiopathy</b>	<b>CD4 &lt; 100</b> <b>RUQ pain ±fever,diarrhoea,cholestasis ± jaundice</b> <b>USS Abdo:structuring and dilatation of bile ducts</b>
<b>Fatty liver</b>	<b>Firm hepatomegaly,± tenderness</b> <b>USS Abdo:hyperechoic texture</b>

**It is often very difficult to manage patients with TB accompanied with severe liver impairment.The safest is to always stop all Hepatotoxic agents(Rifampicin, Isoniazid and Pyrazinamide) and refer patient to a tertially level**

## 9.0 Infectious Diseases

- If jaundice is acute and severe, treat initially with just **Streptomycin** and **Ethambutol**.
- Give **Streptomycin**, **Isoniazid**(find out from TB office whether this is in the protocols because **Isoniazid** is equally hepatotoxic,there is need for an alternativeregime) 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**.

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### 9.5.7.4 Epilepsy

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

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### 9.5.7.5 TB/ART

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- **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.

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### 9.5.8 Corticosteroids and Tuberculosis

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- 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..

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### 9.5.9 Management of Household Contacts of Smear-Positive TB Cases

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#### 9.5.9.1 Children aged 6 years and over

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- 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.

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#### 9.5.9.2 Children below 6 years:

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- 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 (IPT)** (5mg / kg daily for 6 months) if there is no evidence of active TB.

suggestive of TB, refer for further assessment.

## 9.0 Infectious Diseases

- 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.

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### 9.5.9.3 Babies born to mothers with smear-positive Pulmonary TB

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- **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.

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## 9.6 Typhoid

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

### *Treatment*

- Give **Ciprofloxacin** 500mg oral or 400 mg IV q12h 14 days treatment the same for children



## 9.0 Infectious Diseases

- Give **Ceftriaxone** 2g IV q24h for 14 days
- Switch to oral **Ciprofloxacin** when improving and patient able to tolerate

### *If severe*

- IV 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:*

- IV *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*)
- Intestinal perforation and intestinal bleeding are complications
- Refer urgently for surgical attention if suspected

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## 9.7 Sepsis

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

## 9.0 Infectious Diseases

- 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

- Give **Chloramphenicol** 1g IV or IM stat *plus*
- **Gentamycin** 240 mg slow IV or IM stat *plus*
- **Quinine** 1200mg IV in 5% dextrose over 4 hours

### Children

- Give **Benzyl penicillin** 50,000 units/kg IV or IM stat *plus*
- Give **Gentamycin** 7.5 mg/kg slow IV or IM stat *plus*
- Give **Quinine** 10 mg/kg IM 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 IV q24h for 10 days

*Alternatively*

- **Ciprofloxacin** 400 mg IV every q12h or 500 mg orally bd *plus* **Benzylpenicillin** 2MU IV q6h
- Switch to oral **Ciprofloxacin** 500 mg bd *plus* **Amoxicillin** 500 mg tds, or oral **Co-amoxiclav** 625 mg tds, when improved
- Antibiotics should be given for a minimum of 10 days

**Note:use the alternative only with evidence culture and sensitivity**

*If intra-abdominal source suspected:*

- Add **Metronidazole** 500 mg IV or 400 mg orally tds. *If still febrile after 72 hours reassess the patient*

*Children*

- Give **Gentamicin** 7.5mg/kg daily IV *plus*
- **Benzyl penicillin** 50,000 units/kg every 8 hours, initially slow IV later IM

*Alternative to **Benzylpenicillin***

- Give **Ampicillin** 40 mg/kg IV q6h until oral medication can be tolerated *then*
- Give **Amoxicillin** 250 mg tds  
*If still febrile after 72 hours:*
  - Change to **Ceftriaxone** 100mg/kg once daily for *Neonates*
  - Give **Benzyl penicillin** or **Ampicillin/Amoxicillin** as for (older) children above *plus*
  - Give **Gentamycin** 2.5 mg/kg q8h.

## 9.0 Infectious Diseases

*If severe:*

- Give **Ceftriaxone** 100mg/kg IV q24h

*Causes:* 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 to disfigurement)
- In severe itching, give a sedative systemic antihistamine (e.g. oral **Promethazine** or **Chlorpheniramine**).
- 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.

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## 10.0 ONCOLOGY

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- Cancer is unregulated cell division with metastatic potential.
- In general there are two broad groups of cancers: solid and haematological malignancies.
- Solid malignancies include carcinomas and sarcomas, which can affect any part of the body.
- Haematological malignancies include leukaemias and lymphomas.
- The aetiology for cancer is multifactorial (extrinsic and intrinsic).
- Risk factors include radiation exposure, chemicals, viruses and genetic abnormalities such as mutation of the p53 gene; tobacco smoking being a single risk factor.
- General cancer prevention strategies need to target risk factors.

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### 10.1 Cancer Diagnosis and Registration

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#### Clinical presentation:

- Initial presentation is painless mass, whilst pain is a feature of advanced disease.
- Patients may present with non healing ulcer, a fixed mass and cachexia.
- Cachexia, recurrent fevers and night sweats may be a feature in advanced disease or leukemia.

**Physical examination findings:**

- An ulcer with irregular edges, easily bleeds, necrotic on any part of the body. For a mass, it could be fixed, not usually tender and limits the function of the organ involved.

**Laboratory tests:**

- Full blood count –elevated or decreased parameter in the blood, malignancy should be suspected. E.g: WBC >30; Hb >25mg/dl would suggest malignancy
- Tumour markers –elevated titers of betaHCG, CEA, AFP suggest particular cancer. Tumour markers may also be used to monitor response to cancer treatment. Use of these need to be treated cautiously.
- Histology is important confirmatory test for diagnosis.

**Radiological tests:**

- Mammography for breast cancer
- CXR for detection of lung cancer or bone-forming tumours
- Scanning (USS/CT/MRI) investigating particular sites for cancer involvement.

**Haematology, Cytology, Histology:**

- Peripheral blood smear in haematological cancers
- Cytology for solid tumors
- Bone marrow aspirate and trephine
- Immunohistochemistry where available

**Note:**Currently cytology and histology services are done at Kamuzu Central Hospital in Lilongwe (catering for Central and Northern Region) and Queen Elizabeth Central Hospital (catering for the Southern Region).

Haematological services (peripheral blood films, bone marrow biopsies and interpretation etc..) are also available at Kamuzu Central Hospital and to an extent also at QECH.

**Tests to undertake when specific tumours are suspected:**

- Cervical biopsy for histology/or PAP smear, when cervical cancer suspected or in HIV positive females
- PSA, when prostate cancer is suspected, where possible prostate biopsy
- HIV test, when HIV-related cancers (KS, cervical cancer, lymphoma) are suspected or diagnosed
- Barium swallow, endoscopic tissue biopsy for tissue analyses, when cancer of oesophagus suspected

## 10. Oncology

- Breast uss, mammography, biopsy when breast abnormality or breast cancer strongly suspected
- Colonoscopy for suspected GIT malignancies
- Fecal occult blood for suspected GIT malignancies or screening for the same
- Sputum cytology for lung cancer

### **Cautions:**

- Biochemistry tests do not give definitive diagnoses for cancers. They usually indicate the likelihood of having a particular type of cancer. Should be followed up with confirmatory tests such as cytological or histological diagnoses.
- Most radiological tests also do not give definitive diagnoses for cancers. They usually indicate the likelihood of having a particular type of cancer.
- Tumour markers are also produced by some normal cells in the body and levels may also be significantly elevated in non cancerous conditions. Results need to be interpreted with caution.
- Mammograms meant for screening purposes have high false-positive and false-negative results and are associated with overdiagnosis, overtreatment and radiation exposure.



## 10. Oncology

- Most diagnostic tests for cancer are not currently available at primary and secondary level healthcare in Malawi. With the exception of Kaposi's sarcoma, cancer diagnosis and treatment should be limited to central hospitals; suspected cancer patients should therefore be referred to central hospitals.
- Although CT is an important diagnostic tool, it has the potential to cause cancer, just like other sources of ionizing radiation.

### **Cancer Registration:**

- Population based cancer registry, representing the Malawi National Cancer Registry
- Hospital based cancer registries at QECH, KCH, Zomba and Mzuzu Central Hospitals.
- Registers all cancer cases, which is helpful for cancer epidemiology and surveillance.

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## **10.2 Treatment Options:**

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### **General Measures**

- Treatment for cancers is multimodality.
- This includes surgery, radiation and chemotherapy, hormonaltherapy
- Most of the advanced cancers require all the treatment modalities.

## 10. Oncology

- For better treatment outcome, multidisciplinary treatment planning conferences are encouraged.
- Targeted therapy exists but remains expensive

### **Treatment options depend on:**

- Patient's preference
- Cost of treatment
- Stage of disease
- Grade and histological type of cancer
- Co-morbid conditions (hypertension, DM, COPD)
- Performance status (general condition of the patient)
- Age of patient
- Organ function (haematological, liver, renal, cardiorespiratory)

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## **10.3 Most Common Cancer in Malawi**

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### **10.3.1 Kaposi's sarcoma**

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- Currently the number one cancer in men and second most common in females after cancer of the cervix.
- Presentation: mucocutaneous and visceral lesions.

## 10. Oncology

- Mucocutaneous lesions usually manifest as red, purple or brown papules or plaques on the skin or mucous membranes.
- Visceral organs such as lungs or GIT and effusions in serous body cavities.

### *Diagnosis:*

- Do a biopsy for histology.
- FNA is not helpful.
- Clinical diagnosis only without histology may be acceptable at a secondary care facility.
- Do HIV test, if this status is unknown.

### *Treatment:*

- Depends on the extent of disease; early stage can resolve if the patient is on ART alone.
- All patients with HIV associated KS should receive ART.
- Local therapies: radiation and surgery are local therapies applied to KS lesions in general. Radiation therapy is reserved for disease that is limited but causing severe pain, bleeding and distress. Surgery is reserved for aggressive KS locally which is causing severe disfigurement and organ malfunction and overwhelming sepsis. In this case organ amputation is necessary, followed by systemic chemotherapy.

## 10. Oncology

- Systemic therapy: several cytotoxic chemotherapy agents are effective in providing rapid improvement in majority of patients. Chemotherapy is indicated in patients with locally aggressive and disseminated KS.
- **First line treatment:** Monotherapy: **Vincristine  $1.4\text{mg}/\text{m}^2$  {max 2mg}** once a week for six doses; if there is good effect continue with 2mg once every two weeks for six doses. If no effect refer to specialist for dual therapy. Dual therapy: **BV (Bleomycin  $15\text{IU}/\text{m}^2$  IV and Vincristine  $1.4\text{mg}/\text{m}^2$  {max 2mg}** every two weeks, maximum 20 cycles. Triple therapy: **ABV (Adriamycin [Doxorubicin]  $30\text{mg}/\text{m}^2$ , IV; Bleomycin  $15\text{IU}/\text{m}^2$  IV and Vincristine  $1.4\text{mg}/\text{m}^2$ )**. The cycle is repeated every 21 to 28 days for 8 cycles and in patients with good performance status.
- **Second line treatment: Paclitaxel  $120\text{mg}/\text{m}^2$**  every 2 weeks.
  - Second line treatment must be given by specialists.
- Monitoring of treatment for the first three cycles is important.
  - No treatment response, consult specialists.

**Note:** This is the only cancer that may be treated at secondary level healthcare (District Hospital).

- Where oncology facilities/capacity exists vincristine monotherapy should be discouraged

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### 10.3.2 Head and neck cancers

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- These involve the following malignancies:
  - Oral cavity cancers (tongue, floor of mouth), cancers of the oropharynx, nasopharynx, hypopharynx and larynx.

*Presentation:*

- Depends on specific location of the cancer. Non healing ulcers in the mouth, which easily bleed, associated difficulties in mastication and progressive dysphagia. Persistent cough and hoarseness of voice in advanced cases.

*Diagnosis:*

- Done in conjunction with ENT surgeons and pathologists. Radiological imaging forms part of work up (e.g. CT Scan)

## 10. Oncology

### *Treatment:*

- Depends on the extent of disease.
  - Local therapies: Early stage disease – surgery is the treatment of choice. For advanced cases, chemo-radiation is more preferred to surgery for cosmesis and organ preservation as first line treatment. If recurrence, then surgery is treatment of choice.
  - Drugs of choice: Methotrexate, Adriamycin [Doxorubicin], Bleomycin, Vincristine, Cisplatin, Paclitaxel, 5Fluorouracil.
  - Follow up with CT scans with contrast of the head and neck to look for recurrences every six months.

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### **10.3.3 Breast Cancer**

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- The commonest malignant tumors on this site is ductal Carcinoma. Sarcomas and lymphomas may also affect the breast.

#### *Prevention and early detection*

- It is advisable for women above age 20 years to do Self Breast Examination (SBE) monthly for potential masses.

## 10. Oncology

- Women of reproductive age group should have clinical breast examination (CBE) by a nurse or clinician every 6 months.
- Mammography for all women of 50 years of age though recommended in countries like USA by United States Public Service Task Force (USPSTF) is not cost-effective for Malawi therefore is not feasible for population based program.

### *Diagnosis*

- Definitive diagnosis is through histology. This is more superior than cytology which should be understood as a preliminary diagnostic test.

### *Treatment*

- Treatment for this condition is multi-modality, involving:
- **Surgery:** mastectomy and axillary lymph node clearance of only level I and II nodes. **Note:** No role for lumpectomy or breast conserving surgery in state hospital due to lack of radiotherapy or associated delays with foreign referral for radiotherapy.
- **Chemotherapy:** This may be given as neo-adjuvant (before surgery) or adjuvant (after surgery). The first option has advantage of down-staging to make difficult to operate tumors operable. There are many possible Chemotherapy protocols for instance AC, CAF, CMF, TAC, TC, PF. (Cisplatin/5FU)

- However, the first line will be AC in those with normal cardiac function and those otherwise or elderly CMF.
- Second-line **Paclitaxel**
- Third-line PF
- For Metastatic disease consideration of chemotherapy for younger patients or **Tamoxifen** in elderly patients who may not tolerate chemotherapy.
- **Hormonal treatment:** the commonest drug used is **Tamoxifen 20 mg** daily for 5 years. However recent evidence supports 10 years. The side-effects include hot-flushes, risk of cataract formation, thrombosis, and increased risk of endometrial carcinoma. Patient on this therapy have to be monitored by a qualified cancer expert. Other drugs in this category where **Tamoxifen** is contra-indicated is **Anastrozole 1 mg** daily.
- **Radiotherapy:** this is recommended as adjuvant post-surgery to minimize recurrence and improves survival from breast cancer. Only patients that have been assessed to have no lung, liver or bone disease should be referred for this modality.



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### 10.3.4 Oesophagus cancer

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#### *Prevention and early detection*

- Risk factors are alcohol and smoking.
- Other factors include poor seed storage with Aflatoxin contamination.
- Patients presenting with unexplained dysphagia or odynophagia should promptly be investigated.

#### *Treatment options*

- Oesophagectomy
- Radio-chemotherapy (not locally available, consider in fit patients)

**Note:** All patients who are not fit for above curative treatment should be considered for:

- Endoscopic Stenting
- Feeding tube
- By-pass surgery
- Chemotherapy
- Radiotherapy (not locally available, so not feasible in patients with metastases or poor performance status).

#### *Role of chemotherapy in cancer of the oesophagus*

- Neo-adjuvant in good performance patients especially lower third tumours.
- Concurrent chemo-radiotherapy (currently not feasible in Malawi)
- Palliative to relieve dysphagia or other symptoms where patient doesn't prefer stenting.

### **10.3.5 Cervical cancer**

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#### *Prevention and early detection*

- Screening for any woman of reproductive age group above 25 years using VIA.
- The high HIV prevalence may not support age 35 as onset for screening.
- Vaccination with HPV vaccine in girls between 9 years to 14 years. As this manual was being prepared cervarix by GSK and Gardasil by Merck were on the market.

#### *Diagnosis*

- Speculum and cervical punch biopsy for histological analysis.
- Speculum examination before any antibiotic course for women presenting with abnormal vaginal bleeding or foul smelling discharge.

#### *Treatment*

- Total radical hysterectomy with lymph node dissection
- Radiotherapy: EBRT and brachytherapy
- Radio-chemotherapy plus brachytherapy
- Palliative radiotherapy (not a feasible option on public referral system).
- Chemotherapy with Platinum, fluorouracil and Taxanes may be used.
- Palliative care is critical in providing pain control with morphine (see section on pain control).

**Note:** Assessment of this disease needs to be done at a tertiary institution with close discussions between Gynaecologists and Clinical Oncologists to jointly stage and decide on treatment.

*Consider discussing with Oncology team for chemotherapy in the following patients:*

- PV bleeding or excessive vaginal discharge
- Intractable pain on **Morphine**
- Symptomatic metastatic disease

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### 10.3.6 Prostate cancer

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- Lower prevalence rate of Prostate cancer in Malawi can be attributed to mis-diagnosis and lower life expectancy as compared to the global prevalence rate of 7.9% of all cancers and 15% of male cancers.
- **PSA screening** is not recommended as there is no strong evidence in its favour. Where PSA is being ordered for diagnosis ensure there is no UTI or patient has not had recent para-rectal exam as these may give a false rise in PSA.

*Treatment for early prostate cancer*

- Prostatectomy
- Radiotherapy

## 10. Oncology

### *Treatment for advanced or metastatic prostate cancer*

- Orchiectomy
- Hormonal therapy: **Bicalutamide 50 mg** daily
- Chemotherapy may be used (**Taxotere**) in patients failing on hormonal treatment.

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### **10.4 Haematological Malignancies**

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- Currently lymphoma is the commonest haematological malignancy in Malawi:
  - Aggressive NHLs such as HIV associated diffuse large cell lymphoma (DLCL)
  - Burkitts Leukaemia/lymphoma (BL/L).
- The incidence of other haematological conditions in Malawi such as leukemias is difficult to establish because of diagnostic challenges.

### *Diagnosis*

- **Peripheral blood film examination**
  - All abnormal FBC results need peripheral blood film (PBF) examination.

- Patients with haematological malignancies may present with cytopenias (reduced blood cell counts) or cytosés (increased blood cell counts), lymphadenopathy, splenomegaly and/or hepatomegaly.
  - These may result in fevers, severe anemia and/or bleeding.
- Many other common conditions such as infections (e.g. TB) and solid malignancies will present with these features.
- Commonly patients with haematological malignancies are put on antibiotics for bacterial infections or on TB treatment which fail to resolve their clinical problems and, unless corrected in time, may delay appropriate treatment beyond “curative” stages.
- **Bone marrow examination**
  - Although we are only able to do morphological examination of bone marrow aspirates and biopsies in Malawi, bone marrow examination contributes significantly to the diagnosis of hematological conditions in our environment.

## 10. Oncology

- In cases where leukemia patients present with cytopenia(s), bone marrow examination enables a diagnosis to be made.
  - Lymphoma, although not a primary problem of the bone marrow, may involve the bone marrow.
  - Other malignancies may also spread to the bone marrow.
- 
- **Histopathology of other tissues**
  - The diagnosis of lymphomas also commonly requires biopsy of other tissues such as lymph nodes.
  - **Flow cytometry**
  - Flow cytometers are used for CD4 and CD8 enumeration in the care of HIV infected patients in the country.
  - Used to diagnose leukemias from peripheral blood or bone marrow aspirates.

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### 10.4.1 Lymphoma

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- Refer patient to an oncology centre after diagnosis is made
- If available, refer patient with current FBC, U+Es and LFT results
- Basic staging investigations include CXR and abdominal ultrasound.

*Chemotherapy*

- Aggressive lymphomas have a reasonably good response to a combination of chemotherapeutic agents:
- **Cyclophosphamide, Doxorubicin, Vincristine and Prednisolone** given once every three weeks (CHOP 21).
  - Before starting patients on **Doxorubicin**, a cardiac ultrasound is required as **Doxorubicin** is cardiotoxic.
  - Intrathecal chemotherapy may be required depending on patient presentation

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**10.4.2 Acute Leukemias**

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- Acute leukemias are among the most aggressive hematological conditions.
- The chemotherapy available in Malawi is very limited in scope.
- PBF examination facilitates morphological diagnosis which may or may not be sufficient to reach a definitive diagnosis in terms of subtypes of acute leukemias. Treatment is depended on subtypes.

## 10. Oncology

- Acute leukemias typically require four months of hospital admission in self-contained patient rooms. For acute lymphoblastic leukemias, induction, intensification and maintenance treatment cycles last for a total of 2 years.

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### 10.4.3 Chronic Leukemias

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- Chronic lymphocytic leukemia (CLL) and chronic myeloid leukemia (CML) are manageable to some extent even in Malawi. Both can be diagnosed with reasonable certainty based on clinical presentation and PBF examination.
- Chlorambucil for CLL is not available in public hospitals but can be bought in private pharmacies. Cyclophosphamide can also be used for CLL.
- Hydroxyurea can be used for patients that are too poor to afford tyrosine kinase inhibitors. For patients with CML that can afford to have a Philadelphia chromosome test done but can not afford a tyrosine kinase inhibitor, a patient assistance program called Glivec® International Patient Assistance Program (GIPAP), makes imatinib available to such patients in Malawi.
- Potentially GeneXpert technology can provide relatively cheap means of performing molecular testing in Malawi for CML using Xpert BCR-ABL cartridges.



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#### 10.4.4 Multiple myeloma

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- Multiple myeloma (MM) appears to be relatively rare in Malawi, perhaps due to younger population age structure than resource-rich countries.
- Diagnosis of MM relies on a combination of clinical presentation such as bone pain, morphological examination of bone marrow and basic investigations for the CRAB (calcium, renal disease, anemia and bone disease) criteria for MM by way of determination of calcium levels, renal function, full blood count and X-rays. Monoclonal gammopathy should also be demonstrated. Currently, there are no facilities for protein electrophoresis, immunoglobulin quantitation and immunofixation in Malawi.
- In terms of MM treatment, prednisone is commonly available in public pharmacies in Malawi and oral dexamethasone is occasionally available.
- Vincristine, doxorubicin (infusion) and dexamethasone (VAD regimen) can be given in Malawi.

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## 11.0 Musculoskeletal Disorders

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### 11.1 Arthritis (Non-Infective)

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- 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

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#### 11.1.1 Non-Specific Inflammatory Arthritis and Rheumatoid Arthritis

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##### *Signs and Symptoms*

- Pain and swelling in joint
- Fever (especially in children)
- For rheumatoid arthritis key symptoms are: Chronic pain, joint swelling and deformity

##### *Investigations*

- FBC
- X-ray joint
- ESR

##### *Treatment*

###### *Adults:*

###### 1. NSAIDS

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

*Alternatively:*

- Give **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):
  - Give **Indomethacin** 25 – 50mg tds after food for another 7 days  
*or*
  - Give **Diclofenac Sodium** 25-50mg tds after food or **SR** 75mg bd for another 7 days
  - Consider referral for specialist opinion
- 2. Intra-articular steroid injection with **Depo Medrol** or **Triamcinolone**
- 3. Disease Modifying anti-rheumatic agents  
**Methotrexate** (Needs specialist prescription)

*Children:*

- Always refer to hospital
- Prior to referral, give **Aspirin** 20 mg/kg after food qid or **Paracetamol** 15mg/kg tds

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## 11.2 Arthritis (Septic)

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*Symptoms and signs*

- Fever
- Swollen, painful, warm joint
- Severe local tenderness
- Pain on joint motion
- Investigations

## *11. Musculoskeletal Disorders*

- Aspirate the joint for diagnostic and therapeutic purposes

### *Treatment*

#### *Adults:*

- Give **Flucloxacillin** 1g IV every q6h for at least 14 days *plus*
- Give **Ciprofloxacin** 500mg bd
- A further 2-4 weeks of oral antibiotics (**Flucloxacillin** and **Ciprofloxacin**) may be required

#### *Alternatively if penicillin allergic:*

- Give **Clindamycin** 450mg qid or, if not available use **Ceftriaxone** 2g IV daily for 2 weeks followed by oral **Erythromycin** 500mg qid and **Ciprofloxacin** 500mg bd for a duration of 2-4 weeks

#### *Children:*

- Give **Ceftriaxone** 50mg/kg daily

#### *Or alternatively when staphylococcal infection is suspected:*

- Give **Flucloxacillin** 25 mg/kg IV q6h for 14 days

#### *Or if above drugs not available*

- Give **Chloramphenicol** 12.5 mg/kg qid 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

## 11. Musculoskeletal Disorders

**Note:** Surgical drainage may be indicated  
TB septic arthritis is treated as for other forms of  
extra-pulmonary TB

### *Further management*

- If pus present, always refer early for arthrotomy.

**RED FLAG: Always refer early to hospital for systemic treatment and arthrotomy**

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## 11.3 Gout

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### 11.3.1 Acute attack

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#### *Symptoms and signs*

- Redness, tenderness and swelling around the joint
- Mimics septic arthritis

#### *General measures*

- Encourage Rest
- Ensure abundant fluid intake

#### *Treatment*

- Give **Ibuprofen** 800mg qid preferably after food in established cases until attack subsides

#### *Alternatively:*

- Give **Indomethacin** 50-75mg tds with food or
- Give **Diclofenac Sodium** 25-50mg tds preferably after food and preferably suppositories

## 11. Musculoskeletal Disorders

- Give **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
- Give **Prednisolone** 30 – 50mg od for 5 -7 days

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### 11.3.2 Prevention of attacks

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- Encourage physical exercise
- Encourage reduction in dietary protein (if intake is high)
- Avoid alcohol
- Only indicated in recurrent gout attacks.
- **Allopurinol** 100 mg daily after food
- *Maintenance dose*: Up to 200 -600mg od; dosage >300 mg to be given in divided doses; may be required life long
- Gradually increase over 1-3 weeks to 300 mg od, according to plasma or urinary uric acid concentration
- Do not start this treatment until an acute attack has completely subsided

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### 11.4 Musculoskeletal Pain and Trauma

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- 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

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### 11.5.1 Acute Osteomyelitis

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*Adults and Children:*

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

*If pain is severe:*

- Give **Pethidine** 1mg/kg IM
- 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:*

- Give **Flucloxacillin** 25 mg/kg up to a maximum of 500 mg qid, initially IV, then orally from 48 hours after fever has settled

*Alternatively:*

- Give **Chloramphenicol** 25 mg/kg up to a maximum of 500mg qid, initially IV, then orally from 48 hours after fever has settled

*Children Under 2 years:*

- Give **Ceftriaxone** 50mg/kg od or  
(Especially if *staphylococcal infection is very likely*):
- Give **Flucloxacillin** 25 mg/kg qid, initially IV, then orally from 48 hours after fever has settled

## 11. Musculoskeletal Disorders

*Alternatively, if the above not available:*

- Give **Chloramphenicol** 25 mg/kg qid, initially IV, then orally from 48 hours after fever has settled

**Note:** Antibiotic treatment should be continued for 4 weeks under hospital supervision.

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### 11.5.2 Chronic Osteomyelitis

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*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 od in 3 divided doses after food

*Alternatively:*

- Give **Aspirin** 10mg/kg tds, preferably after food, up to an adult maximum of 600 mg per dose
- For children, give **Paracetamol** instead of **Aspirin**



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## 11.6 Rheumatic fever

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**Note:** Always refer to hospital

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### 11.6.1 Acute attack

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*Treatment*

- Give **Benzathine Penicillin** 1.2MU IM single dose
  - Children <30 kg: **Benzathine Penicillin** 600,000 units

*Alternatively, if compliance can be ensured:*

- **Phenoxymethylpenicillin** 250 mg qid for 10 days
  - Children: **Phenoxymethylpenicillin** 12.5 mg/kg/dose

*Alternatively, if penicillin allergy:*

- **Erythromycin** 500mg tds for 10 days

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### 11.6.2 Acute Carditis

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- Strict bed rest until carditis has resolved

*Adults and children:*

*Treatment*

- Give **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

## 11. Musculoskeletal Disorders

- 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 od
- Reduce dose gradually after 3-4 weeks
- Treat heart failure

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### 11.6.3 Chorea

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*Treatment*

*Adults and Children:*

- Give **Haloperidol** 25 micrograms/kg tds

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### 11.6.4 Prophylaxis of Rheumatic fever

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#### 11.6.4.1 Prevention of further attacks

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- Continue treatment until at least age 25

*Treatment*

- Give **Benzathine Penicillin** 1.2 MU IM monthly
  - Children < 30 kg: 600,000 units/dose

*Alternative if compliance can be ensured:*

- Give **Phenoxymethylpenicillin** 250mg bd

*Alternative if penicillin allergy:*

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

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#### 11.6.4.2 Prophylaxis of Bacterial Endocarditis

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

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#### 11.6.4.3 Before Dental Extraction

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*Prophylaxis in Adults and Children > 30 kg:*

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

*Alternatively if penicillin allergy:*

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

*Prophylaxis in Children > 30 kg:*

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

*Alternatively if penicillin allergy:*

- Give **Clindamycin** 600mg, orally, taken 1 hour before the procedure and 300mg 6 hours later

*Prophylaxis in Children > 30kg:*

- Give **Clindamycin** 600mg IM/IV 30min prior to the procedure followed by 300mg 6 hourly. (20mg/kg for children) OR
- Give **Ceftriaxone** 1g IV prior to the procedure or 50mg/kg

For high risk patients add:

**Gentamicin** 1.6mg/kg prior to the procedure OR

**Vancomycin** 1g IV (20mg/kg/IV for children <10 years old) prior to the procedure.

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#### 11.6.4.4 Prophylaxis before other procedures

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

- Give **Amoxycillin** 1g IV or IM plus
- Give **Gentamycin** 2mg/kg IV or IM 30 minutes before the procedure, then
- Give **Amoxycillin** 500mg taken 6 hours later

*Alternative if penicillin allergy:*

- Give **Erythromycin** 500mg qid 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

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### 11.7 Cellulitis and Tropical Pyomyositis

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- Treatment for cellulitis 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:*

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

*If penicillin allergic:*

- Give **Ceftriaxone** 2g IV daily for 2 weeks

**Note:** For Pyomyositis, perform surgical treatment (abscess drainage) when the swelling becomes fluctuant, alongside antibiotics

## **12.0 Sexual and Reproductive Health**

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### **12.1 Obstetric conditions**

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#### **12.1.1 Antenatal Care**

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- Centred on ensuring, supporting and maintaining maternal and foetal well being throughout normal pregnancy and childbirth

Pillars of FANC:

- Early detection and treatment of problems and complications
- Prevention of complications and diseases
- Birth preparedness and complication readiness
- Health promotion

## 12. Sexual and Reproductive Health

### Frequency and timing of FANC visits:

- Appropriate scheduling depends on the gestational age of the pregnancy and also the woman's individual needs. For women whose pregnancies are progressing normally, four visits are sufficiently; one in first trimester, another one in second trimester and two in the third trimester
- Women with common discomforts, special needs, conditions that lie beyond the scope of basic care, or other problems may require additional visits

### ANTENATAL CARE MATRIX

Parameter	Weeks of Gestation			
	First visit or <16 weeks	20–24 weeks	28–32 weeks	36 weeks
Registration	ü			
Comprehensive history-taking	ü			
History of complaints of current pregnancy	ü	ü	ü	ü
Observations and clinical investigations				

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## 12.1.2 Hypertensive Disorders in Pregnancy

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### 12.1.2.1 Pregnancy-Induced Hypertension (PIH)

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*At Health Centre*

- Blood Pressure  $\geq$  140/90mmHg or an increase of Systolic BP of 20 and Diastolic BP of 15 from pre-pregnancy levels.
- Recheck Blood Pressure after resting for 10 - 15 minutes

*If still raised:*

- Refer to the next higher level if it's severe PIH, Pre-eclampsia and eclampsia with accompaniment of a health worker.
- In case of eclampsia or eminent eclampsia; give a loading dose of 4g **Magnesium Sulphate** 20% solution in 500 ml of **Normal Saline** infused over 10 minutes plus 5 g of **Magnesium Sulphate** 50% solution in each buttock deep IM with 1 ml of 1% lignocaine
- Refer immediately

*At the hospital*

- Admit
- Re-assess the patient and exclude severe forms.

*If it's Pregnancy Induced Hypertension (PIH)*

- Give **Methyldopa** 500mg to 1g q8h until BP settles. If no improvement, add **Nifedipine SR** po to a maximum of 40 mg tds

### 12.1.2.2 Pre-eclampsia

---

#### *Symptoms and signs:*

- Raised BP  $\geq$  140/90mmHg, proteinuria  $\geq$  + (dipstick),  $\pm$  oedema, at the gestation  $\geq$  20 weeks

#### *Treatment*

#### *If signs of pre-eclampsia*

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

#### *If diastolic BP >90mm Hg and <110mm Hg then give*

- Give **Methyldopa** 500mg to 1g tds and review daily

#### *If diastolic >110mm Hg*

- Do not lower BP abruptly and avoid use of sublingual nifedipine
- Give **Hydralazine** 5mg IV slowly over 5 min.
- Repeat every 20 minutes until diastolic pressure is below 110 mm Hg.

#### *If diastolic BP is still >110*

- Give **Hydralazine** 40mg IV in 1 litre of **Ringer's Lactate** over 8 hours to maintain BP at below 110 mmHg.

#### *Alternatively*

- Give **Nifedipine** 10mg. Recheck BP in 20 minutes. Repeat **Nifedipine** if diastolic  $\geq$ 110mmHg, manage as severe pre-eclampsia.



## 12. Sexual and Reproductive Health

- Watch carefully for eclampsia: If this develops see section for eclampsia
- Consider delivery regardless of gestational age if:
  - BP is difficult to control
  - Urine output is decreasing
  - Critical signs/symptoms persist (suggesting severe pre-eclampsia) eclampsia

---

### 12.1.2.3 Severe Pre-Eclampsia

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#### *Symptoms/Signs*

- Diastolic BP >110, marked oedema, proteinuria ++/+++, headache, blurred vision, epigastric pain, oliguria, hyper-reflexia

#### *Management*

- Admit in labour ward
- Put up an IV line normal saline
- Give 4g of 20% of **Magnesium Sulphate** ( $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ ) solution IV over 5 minute period (20 mls)
- Administer 5g of 50% **Magnesium Sulphate** ( $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ ) (20 mls) with 1ml of 1%
- **Lignocaine** IM deep in each buttock (total 10 g)
- Catheterize
- Monitor BP every 15 minutes until BP is lowered, then hourly

## 12. Sexual and Reproductive Health

- In the event of a convulsion after 15 minutes administer 2g of 50% **Magnesium Sulphate** solution IV over 5 minutes (4mls)
- Monitor foetal heart every 30 minutes
- Refer to hospital labour ward and the midwife to escort the woman

### Magnesium Sulphate Toxicity

#### Toxicity

- 1) Patella Reflexes are absent
- 2) Respiratory rate < 16 per minute
- 3) Urine output < 30ml/hr since last admission of Magnesium Sulphate 4 hrs ago

#### Before Giving The Next Dose, Ensure That

- 1) Patella Reflexes are present
- 2) Respiratory Rate is  $\geq 16$ /min
- 3) Urine output is  $\geq 30$  ml/hr since the last admission of Magnesium Sulphate 4 hrs ago

#### In Case of Toxicity

- 1) Don't give the next dose of Magnesium Sulphate
- 2) Assist ventilation if respiratory arrest (mask & bag; if severe respiratory depression, endotracheal intubation & mechanical ventilation)
- 3) Calcium gluconate 1g IV slowly until toxic effects are reversed

#### Magnesium Sulphate & Nifedipine

If both are administered simultaneously, BP may drop precipitously because both are Calcium antagonists. The risk is there though rare.

**NB: The Magnesium Sulphate used in Pre-eclampsia and Eclampsia has the formula**



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### 12.1.2.3.1 Foetal Well-being or Maturity

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#### Check

- Full blood count, urea & creatinine in serum
- Liver function tests
- Electrolytes: sodium, potassium, and chloride
  - Refer to central hospital if lab results are derranged

#### *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 clinician
- Assess fetal well-being using Ultrasound scan or Cardiotocograph
- Give **Dexamethasone** 6mg every twelve hours IM for 4 doses

#### *Alternatively*

- **Betamethasone** 12mg IM once daily for a total of 2 doses

---

### 12.1.2.4 Eclampsia

---

#### *Signs and symptoms*

- Convulsions
- Diastolic BP  $\geq$  90 mm Hg after 20 weeks gestation
- Proteinuria  $\geq$  2+

## *12. Sexual and Reproductive Health*

**Note:** Convulsions can occur prior to labour, intrapartum or postpartum.

If a pregnant woman convulses start treatment for eclampsia, but rule out other organic causes, including Epilepsy, Meningitis, Cerebral malaria, Encephalitis, Hypoglycemia

### *General management*

- Place the woman on her side to reduce risk of aspiration
- Secure airway, aspirate secretions or vomitus
- Give adequate oxygen supply by nasal prongs or face mask
- Protect the woman from injury
- Put up an IV line normal saline
- Control convulsions with magnesium sulphate (see dose below)
- Give 4g of 20% of **Magnesium Sulphate** IV over 5 minute period (20 mls)
- Administer 5g of 50% **Magnesium Sulphate** (20mls) with 1ml of 2% **Lignocaine** IM deep in each buttock (total 10 g)
- Catheterize
- Monitor BP every 15 minutes until BP is lowered, then hourly
- In the event of a convulsion after 15 minutes administer 2g of 50% **Magnesium Sulphate** IV over 5 minutes (4mls)
- Monitor foetal heart half hourly

## 12. Sexual and Reproductive Health

### Treatment

- Closely monitor for signs of magnesium sulphate toxicity such as presence of patella reflexes, the respiratory rate (not less than 16), 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** 5g of 50% solution every 4 hours deep IM 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:** 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 IV 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
- If not already at hospital, refer the patient to hospital

**RED FLAG: In case of Magnesium Sulphate toxicity administer Calcium Gluconate 1gm as IV stat dose and stop Magnesium Sulphate**

## 12. Sexual and Reproductive Health

### *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 IV push in the 3<sup>rd</sup> stage
- Do not use ergometrine

### *Monitoring*

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

---

### **12.1.3 Prelabour/Premature Rupture of Membranes**

---

- Rupture of the membranes before labour (prelabour is >37 weeks gestation while PPRM is before 37weeks)

### *Signs and Symptoms*

- Watery vaginal discharge
- *Management If gestation less than 34 weeks*
  - No digital vaginal examination should be done
  - *If the diagnosis is in doubt*, perform sterile speculum examination as well rule out cord prolapse
  - Check vital signs 4 times hourly, assess fetal heart rate

## 12. Sexual and Reproductive Health

- Provide a pad and observe for colour amount and smell of liquor daily
- If at a Health Centre,
  - Give **Erythromycin** 250mg tds for 7 days
  - Give **Metronidazole** 400mg tds for 7 days
  - Give corticosteroids if <34 weeks. Refer immediately
- If at the Hospital
  - If still draining, deliver at 34 weeks if there are no other contraindications
  - *If signs of intra-uterine infection* (temperature 37.5 °C or more, purulent or offensive liquor), *or fetal distress*. Inform the most senior person available, and plan urgent delivery regardless of gestational age
- *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 12 hours, give antibiotics:
    - Give **Ampicillin** 2g IV every 6 hours
    - If no signs of infection evident; give **Erythromycin** 500mgs qid

## 12. Sexual and Reproductive Health

### *Alternatively*

- Give **Benzylpenicillin** 2 MU IV every 6 hours until delivery
- Stop 48 hours 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 caesarean section
  - If signs of intra-uterine infection develop, inform the most senior person available, to decide on mode of delivery

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### **12.1.4 Chorioamnionitis**

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- Intra-uterine infection

#### *Signs and Symptoms*

- Foul-smelling vaginal discharge after 28 weeks of pregnancy,
- Fever/chills, abdominal pain, fetal tachycardia

#### *Treatment*

- Give **Benzylpenicillin** 2.5 MU IV stat and/or
- Give **Ampicillin** 2gms IV stat
- Refer to hospital

#### *At hospital*

- Give **Metronidazole** 500mg IV q8h, and
- Ampicilline 1g qid/**Benzylpenicillin** 2 MU IV q6h and
- Give **Gentamycin** 240 mg IM single dose daily



## 12. Sexual and Reproductive Health

- Continue for 48 hrs after the fever subsides, but not less than 5 days.
- Deliver urgently. Induce or accelerate labour with **Oxytocin** if the cervix is favourable and no contraindications; do caesarean section if necessary.
- If mother has amnionitis or if membranes were ruptured for more than 12 hours before delivery, start newborn on:
  - Give **Benzympenicillin** 50,000 IU/kg/dose IM q12h
  - Give **Gentamycin** 5 mg/kg IM od for 5 days if birth weight >1500 g).

---

### 12.1.5 Antepartum Haemorrhage

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Vaginal bleeding from 28 weeks gestation to before delivery

- Consider: abruptio placenta, placenta previa, Ruptured uterus, cervicitis

#### *Management*

- Explain to the patient
- Avoid digital vaginal examination
  - Check vital signs
  - Insert large bore canulae, with **Ringer's Lactate** or normal saline
  - If at a Health Centre refer
- *At the hospital*
  - Urgent FBC, group and cross match
  - Start plasma expanders or transfusion if haemodynamically compromised. FFP if DIC suspected
  - Ultrasound examination (*if feasible*)

## 12. Sexual and Reproductive Health

- Plan for urgent delivery and/or laparotomy regardless of Gestational age

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### 12.1.6 Medical Conditions in Pregnancy

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#### 12.1.6.1 Malaria in Pregnancy

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- Similar presentation as in non-pregnant woman, however prone to complications:
  - Hypoglycaemia and preterm delivery

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#### 12.1.6.2 Uncomplicated Malaria

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- In 1<sup>st</sup> trimester of pregnancy give oral **Quinine** 10mg/kg body weight, administered q8h for 7 days.
- In 2<sup>nd</sup> and 3<sup>rd</sup> trimester give **Lumefantrine Artemether (LA)** bd for 3 days.

**Note:** Pregnant women are susceptible to hypoglycemia when taking quinine.

---

#### 12.1.6.3 Severe malaria in pregnancy

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##### *Treatment*

- Same as adults
- Avoid usage of **Artesunate** in 1<sup>st</sup> trimester.
- Refer to Severe Malaria section

---

#### 12.1.6.4 HIV/AIDs in Pregnancy

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- Ascertain HIV status in all pregnant women
- Offer HTC if unknown status
- Manage as per current PMTCT program guidelines

---

### 12.1.6.5 Anaemia in Pregnancy

---

- Anaemia in pregnancy is defined as HB of less than 11g/dl, (severe anemia is HB less than 7g/dl at any gestational age).

#### *Signs and symptoms*

- Fatigue, headache, weakness, heart palpitations and dizziness

#### *Physical Examination*

- Pallor of the skin and mucous membrane.

#### **At Health Centre**

- If HB is < 8 g/dl or any complications, refer

#### *Prevention*

- Provide all antenatal women with **FeFol** 325mg po bd
- Advise on diet rich in green leafy vegetable, liver, fish, eggs
- To prevent hook worm give **Albendazole** (400 mg stat)
- To prevent malaria give 2 doses **SP** (three tablets each dose) 4 weeks apart, starting after quickening (16 weeks gestation)
- Advise to keep adequate interval between pregnancy > 2 years minimum
- All breastfeeding mothers should take iron supplements

## At District Hospital

### Management

- Prevention (as above in Health Centre)

### Treatment

- FBC and treat according to the result
  - If HB is < 7g/dl especially if symptomatic, then blood transfusion
    - Transfuse rapidly if anemia due to blood loss.
    - Transfuse slowly and with diuretics if chronic anaemia. (To reduce risk of congestive cardiac failure due to sudden circulatory overload.)
    - Treat with ferrous sulphate/ folic po bd and recheck HB in 2 to 4 weeks.
- Urine and stool examination and treat according to results
- Treat malaria or schistosomiasis if indicated
- If Haemoglobinopathy (e.g. sickle cell anemia) is suspected, then refer

---

### 12.1.6.6 Diabetes in Pregnancy

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- It is a group of metabolic disease characterized by hypersensitivity from defects in insulin secretion, action or both. Can be gestational or preexisting.

### Signs and symptoms

- History: Polyuria, polyphagia, polydipsia. Suspect/screen in macrosomia, unexplained IUD, FHx of DM, Maternal obesity, excessive weight gain

**At Health centre**

- Refer to the next level

**At District hospital**

*Management*

- Goal is to maintain FBS at 6 – 8MMOI/l for gestational

*Investigations*

- Routine Investigations (FANC), others RBS, Hb A<sub>1</sub>C
- Ophthalmic examination

**Note:** (It is advisable to manage only uncomplicated diabetes mellitus)

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**12.1.6.7 Prepregnancy Care**

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- Pregnancy counselling: diet, ideal weight and sugar levels
- Switch to insulin if unstable on oral drugs

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**12.1.6.8 Antenatally**

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- Continue pre- pregnancy regimen if blood sugar is controlled.
- Consider in patient admission for DM5 education and glucose control.
- Antenatal care every 2 weeks until 30 wks. gestation, then weekly until delivery
- Screen all pregnant women at 24 – 30 weeks
- Patient log book to self-record daily insulin dosages and daily blood glucose levels before each meal (3 meals) and 2200 hours (before going to bed)Check FBS

## 12. Sexual and Reproductive Health

- If  $<6\text{mmol/l}$  (108 mg/dl), patient is managed by diet alone.
- If  $> 6\text{ mmol/l}$  **Insulin** must be started.
  - If first trimester, total daily dose = weight  $\times$  0.7 units
  - If second trimester, total daily dose = weight  $\times$  0.8 units
  - If third trimester, total daily dose = weight  $\times$  0.9 – 1.0 units
  - Given as  $2/3$  of total daily dose in the morning at breakfast:  $1/3$  **Soluble Insulin** and  $1/3$  as **Long Acting Insulin**
  - Given as  $1/3$  of total daily dose in the evening at dinner (17 hrs):  $1/2$  as **Long Acting Insulin**
  - For example, for weight of 72 kgs in third trimester, give 16 units **Soluble Insulin** and 32 units **Long Acting Insulin** at breakfast and 12 units **Soluble Insulin** and 12 units **Long Acting Insulin** at supper.
- Ultrasound every 4 weeks

---

### 12.1.6.9 Intrapartum Management

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- Hospitalization at 34 – 36 weeks
- Elective delivery at 38 -39 weeks
  - No specific treatment if labor progresses normally and quickly
  - For induction, or prolonged labor: add  $1/3$  of her daily insulin as soluble to 1 L of **Dextrose Normal Saline (DNS)** and treat 40dpm

## 12. Sexual and Reproductive Health

- For caesarean: skip **AM Insulin**, start **DNS**
- Place **Oxytocin** in separate bag of **Normal Saline (NS)** fluid using separate IV access
- At 39 weeks gestation for women with well controlled blood sugar and no vascular disease.
- At earlier gestation for class D and higher, polyhydromnoios, macrosomia, poor blood glucose control, Chronic Hypertension on medication or IUGR and IUD
- Caesarian delivery for EFW > 4500 on UD.

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### 12.1.6.10 Postnatal period

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- Breastfeeding infant early and notify pediatric clinician of maternal diabetes
- Use insulin sliding scale for 5 days post vaginal delivery and then resume pre pregnancy regimen
- Treat with DNS at 3L daily post C/S until tolerating PO and then use insulin sliding scale
- Advise mothers to start diabetic diet as soon as possible

**Note:** COMPLICATED DIABETES (Refer to central hospital)

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### 12.1.7 Dysfunctional Labour Syndrome

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- Labour not progressing according to expectation; has passed alert line

#### *Management*

- Explain to the mother
- Ensure adequate pain relief and hydration

## 12. Sexual and Reproductive Health

- Check vital signs
- Analyze partogram
- Consult senior or refer as soon as possible
- Consider 3 P's:
  - Passenger: assess size of baby, presentation, position, fetal distress
  - Power: if contractions are inadequate, then augment
  - Passage: assess pelvis adequacy and consider C/S
    - ✓ If obstructed labour (caput ++, moulding > ++, Cervix poorly applied, Bands ring, maternal and fetal distress)
      - Secure IV access, Group and Xmatch, secure blood
      - Start IV antibiotics: Give **Ampicillin 1g IV Stat**
      - Monitor vital signs
      - Catheterize
      - Prepare for C/S stat.
    - ✓ If Ruptured uterus suspected: Do laparotomy

---

### 12.1.8 Caesarian Section

---

- This operation is the process whereby the child is removed from the uterus by direct incision through the abdominal wall and the uterus following indications that arise from the mother, the fetus, or both.

#### At Health Centre

- Refer to the District Hospital



### At District Hospital

- Elective indications
  - Prophylaxis: Give **Ceftriaxone** IV 2g stat OR **Ampicillin** 2g stat (30 min- 1hr before operation)
- Emergency Indications
  - All cases should be done within 2hrs

### Management

- Do FBC
- Antibiotherapy:
  - 1<sup>st</sup> line, give **Ampicillin** 1g q6h for 7 days + **Gentamycin** 160mg q24h for 5 days (if no contraindications)
  - 2<sup>nd</sup> line, give **Metronidazole** IV 500mg q8h for 5 days or **Metronidazole** tablets 400mg tds for 7 days
  - 3<sup>rd</sup> Line, **Ceftriaxone** 1g q12h for 7-10 days
- Sitz bath twice daily if there is episiotomy or tears- Care of incision wound
- Correct anaemia if it is there
- High protein food in patients with malnutrition
- Proper information, education and communication (IEC) concerning hygiene for the baby and mother

---

#### 12.1.9 Intrauterine Death (IUD)

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- Death of the fetus > 24 weeks gestation or > 500gms weight

## 12. Sexual and Reproductive Health

### *Clinical signs*

- Patient complains of absence of fetal movement. If IUD is few days old breast size may diminish and colostrum secretion may start in some cases.

### **At Health Centre**

- Refer to the District Hospital

### **At District Hospital**

- Diagnosis: Decreased or absent fetal movement
- Exam: No fetal heart heard on fetoscope or doptones, fundal height may be less than expected.
- Investigations: US with no fetal cardiac (Verify by 2 health care providers); check FBC, RBS, grouping VDRL

### *Management*

- Induction of labour (refer to Reproductive Health protocols)
  - If augmentation of labour, then manage similar to live birth
  - Ensure privacy to the extent possible
  - Provide bereavement counselling
  - Placental evaluation and perinatal autopsy recommended
  - ARM is avoided in early labour as it can lead to ascending infection.
  - Prophylaxis: Give **Ceftriaxone** IV 2g stat.
  - Antibiotherapy: if signs of infection or macerated (Monotherapy or triple therapy)

## 12. Sexual and Reproductive Health

- ✓ 1<sup>st</sup> line: give **Ampicillin** 1g q6h for 7 day + **Gentamycin** 160mg q24h for 5 days (if no contraindications)
- ✓ 2<sup>nd</sup> line: give **Metronidazole** IV 500mg q8h for 5 days or **Metronidazole** tablets 400mg tds for 7 days
- ✓ 3<sup>rd</sup> line: give **Ceftriaxone** 2g q24h for 7-10 days
- Triple therapy: give **Ampicillin** IV 1g q6h 7 days + **Gentamycin** IV 160mg q24h for 5 days + **Metronidazole** IV 500mg q8h for 7 -10 days
- Caesarian section: performed if spontaneous delivery failed, if there is contraindication of SVD or contraindication of induction.
- Craniotomy should be performed at central hospital level only with Craniotomy set.
- Decapitation of the baby should not be performed.

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### 12.1.10 Neonatal resuscitation

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- Refer to WHO neonatal resuscitation flow chart second edition

---

### 12.1.11 Cord care

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- Wait for 1 to 3 minutes or for cessation of the cord pulsation, then clamp
- Tie the cord with two sterile ties; one 2 cms from the baby's body and the next 3cms from the first tie
- Apply **7.1% Chlorhexidine Digluconate** to the cord stump soon after cutting to prevent infection

## 12. Sexual and Reproductive Health

- Continue monitoring the stump for bleeding, especially in the first 24 hours
- Bleeding later on from the cord might indicate haemorrhagic disease of the newborn (due to Vitamin K deficiency) or an infection. Refer urgently.

---

### 12.1.12 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, endomyometritis

---

#### 12.1.12.1 Primary PPH

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- Abnormal vaginal bleeding within 24 hours of delivery
- Resuscitate
- Set up an IV line and empty bladder
- Replace blood loss with IV fluids / blood
- Identify and treat the cause
- *If uterine atony:*
  - Rub up a contraction
  - Give 10 units **Oxytocin** IV stat then 40 units infusion
  - Give **Misoprostol** 1000mcg rectally
  - Refer to hospital with nurse accompaniment

## 12. Sexual and Reproductive Health

- *If retained placenta:*
  - Attempt manual removal or evacuation in theatre
  - Inspect the vagina thoroughly for perineal injuries and repair
    - ✓ *If above interventions fail:*
      - *Take patient to theatre for exploratory laparotomy; B-lynch suture or hysterectomy*

---

### 12.1.12.2 Secondary PPH

---

- Abnormal bleeding 24 hours or more after delivery

#### *Causes*

- Retained products, often with infection

#### *Treatment*

- Set up an IV line and resuscitate
- Replace blood loss with IV fluids/blood
- Empty bladder
- Rub up a contraction
- Give **Oxytocin** 10 units IM
- Give **Amoxicillin** 500 mg tds plus **Metronidazole** 400 mg tds
- *Alternatively if penicillin sensitive:* Give **Erythromycin** 500 mg qid
- Refer immediately for evacuation of the uterus

#### *Supportive measures*

- If patient is septic start antibiotics; **Ampicillin** 1g qid/ **Benzyl penicillin** 2 MU IV q6h, **Gentamycin** 240mg od, **Metronidazole** 500mg tid

## 12. Sexual and Reproductive Health

- Give IV fluids to sustain a high degree of perfusion

---

### 12.1.13 Post-Natal Care

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- For care of a woman from immediately after birth to 6 weeks, refer to Reproductive Health protocols

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## 12.2 GYNAECOLOGY

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### 12.2.1 Abnormal Vaginal Bleeding

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- Bleeding which deviates from normal menstrual pattern: interval, duration amount.

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#### 12.2.1.1 Acute Vaginal Bleeding

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- Resuscitate
- Exclude pregnancy
- To reduce/stop bleeding
  - Give **Ibuprofen** 400mg q8h for 5 days
  - Give **Traxenamic Acid** 1g q8h hourly po for up to 5 days
  - Combined oral contraceptive 2 tabs od x10days od then 2-6 cycles unless contraindicated
  - Give **Ferous Sulphate** 20mg od. Refer if persistent
- *Young adolescents*, usually physiological, pathology rare
  - Exclude pregnancy and its complications and manage conservatively
  - If bleeding is heavy manage as above

## 12. Sexual and Reproductive Health

- *Women of child bearing age:*
  - Strongly suspect complications of pregnancy including ectopic pregnancy. Other causes: use of hormonal contraceptives, DUB, ICD, fibroids, choriocarcinoma, cervical cancer
  - Speculum examination mandatory to rule out local causes

---

### 12.2.2 Dysfunctional Uterine Bleeding

---

- Usually no organic cause found

#### *Management*

- Give **Cyclic Progesterone** 5-10mg bdx 14 days on second part of the cycle; alternatively, oral COC 1 od 3-6 cycles
- If no improvement refer to specialist

#### *Post-menopausal women*

- Important causes are endometrial cancer, cervical cancers, cervical polyps, atrophic vaginitis
- Always need investigation therefore refer early

#### **At the hospital**

- Speculum examination mandatory
- USS for masses and endometrial thickness. If >4mm, do diagnostic D&C

---

### 12.2.3 Abortion and its complications

---

Loss of pregnancy before viability 28 weeks or

- Fetal weight 500g
- Post abortal Sepsis

*Complications*

- **Post abortal haemorrhage**
  - Resuscitate and stabilize the patient
  - Carry out vaginal examination
  - Remove products of conception and/or foreign bodies
  - Give **Oxytocin** 10 units IM
  - Alternatively, give **Misoprostol** 600mcg po or 400mcg sublingually
  - Perform (or if not possible refer) evacuation or manual vacuum aspiration (MVA) if gestation < 12 weeks
  - If septic abortion suspected stat doses of antibiotics (refer to section on septic abortion)

*Key features*

- Persistent fevers for >24hrs, foul smelling lochia, persistent bleeding

*Management*

- Maintain hydration: set up an IV line and give IV fluids
- Give **Paracetamol** 1 g stat
- Give **Oxytocin** 10 units IM to contract uterus
- Refer to hospital for evacuation of the uterus



## 12. Sexual and Reproductive Health

### At hospital

- Give **Misoprostol** 600mcg PR stat
- Give antibiotic treatment for 7 days as follows:

#### *For sepsis*

- If patient is able to take po drugs; give **Doxycycline** 100mg bd x 7 days and **Metronidazole** 400mg tds x 7 days

#### *If patient is septic use IV drugs as follows:*

- Give **Metronidazole** 500 mg tds
- Give **Gentamycin** 320mg IM stat
- Give **Benzyl Penicillin** 2 MU IV q6h
- Consider uterine careful evacuation in some cases

#### *If not improving:*

- Reassess and consider the appropriate intervention
- Change of antibiotics

- **Comprehensive post arbortal management plan**

- Counseling for contraception, HTC, future fertility plans/pregnancy care
- Cervical cancer screening
- STI/HIV prevention and treatment

### 12.2.4 Ectopic Pregnancy

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- Often comes ruptured
- Cardinal signs and symptoms include: bleeding following amenorrhoea, PT positive, abdominal distension/tenderness, signs of haemorrhagic shock (low BP, high PR)
- Diagnosis is primarily clinical, Couldoscentis may support diagnosis
- Refer immediately to a hospital

#### At Hospital

- FBC, group and cross match
- Laparotomy stat. Do not wait for resuscitation
- Cover for chlamydia with **Doxycycline** 100mg bd x7 days

---

### 12.2.5 Vaginal Candidiasis (Moniliasis)

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

#### *Treatment*

#### *Adults:*

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

## 12. Sexual and Reproductive Health

### Alternatively

- Give **Miconazole** 200mg intravaginally once daily for 3 days or
- Give **Fluconazole** 150mg orally as single dose (contra-indicated in pregnancy)

OR

- Give **Nystatin Pessary** 100,000 IU vaginally every 12 hours for 7 days

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

- Apply the same vaginal cream as the patient
- Recurrent vulvalvaginal candidiasis should be referred to hospital

---

### 12.2.6 Dysmenorrhoea

---

- Rule out organic causes like PID, endometriosis, fibroids

### Management

- Non pharmacological management (e.g. hot water bottle)
- Give **Mefenamic Acid** 500mg every 8 hours during menses for not more than 7 days

### Alternatively

- Give **Ibuprofen** 400mg tds (*see section on analgesics*)

*If no response:*

- Give cyclical courses of **Low Estrogen Combined Oral Contraceptive** tablets once daily for 3 – 6 months

## 12. Sexual and Reproductive Health

### *If there is still no improvement*

- Refer to hospital

---

### **12.2.7 Mastitis**

---

#### *General Measures*

- Apply hot compression and a constrictive bandage or bra 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 (e.g. **Bromocriptine** 2.5mg bid x 7-14 days)

#### *Treatment*

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

#### *Alternatively*

- Give **Amoxicillin** 500mg tds for 5-7 days
- If penicilline sensitive give **Erythromycin** 500mg tds for 5 – 7 days
- Give **Aspirin** 600 mg tds after food

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### **12.2.8 Breast abscess**

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- If breast abscess forms, drain surgically
- Change dressing every day
- Give antibiotic treatment as above

---

### 12.2.9 Obstetrical Fistula

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- Obstructed labour is the most common cause of urogenital fistula in Malawi. Other aetiologies include surgery, radiation therapy and trauma or instrumental vaginal delivery.

#### *Signs and symptoms*

- Draining urine or stools through the vagina

#### *Prevention*

- Encourage food rich in nutrition to girls before they get pregnant.
- Discourage early pregnancies.
- Encourage all pregnant women to attend antenatal care.
- Encourage pelvimetry during antenatal to all pregnant women
- Screen the high parturient (woman in labour).
- Encourage use and interpretation of partograph to all parturients.
- Encourage all parturients to deliver with a skilled birth attendant
- Caesarian section must be done by skilled personnel

#### **At Health Centre**

- Refer all patients with draining urine and/or stools to the District Hospital

### **At District Hospital**

- Reassess the patient to confirm the diagnosis with physical examination and dye test
- Repair minor and uncomplicated fistulas (a small hole from the bladder to the vagina). These must be repaired within 2 to 72 hours post delivery
- Refer all complicated fistulae to the Central Hospital, such as: VVF of more than 2cm, rectal vaginal fistulae, ureteral vaginal and urethral vaginal fistulae

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## **12.3 Contraceptives**

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### *Types*

- Combined hormonal contraceptives, progestogen only contraceptive, contraceptive devices, emergency contraceptive, barrier methods.

---

### **12.3.1 Combined Oral Contraceptive (COC)**

---

- Most effective preparations for general use.
- Contain oestrogen and progestogen. Lowest effective dose preparations preferable.

### *Indications*

- Contraception
- Menstrual disturbances

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### 12.3.2 Oral Progestogen Only Contraceptive Pill

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- Have a higher failure rate than COCs.
- Suitable alternative when Estrogens are contraindicated; hypertensives, 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 the same time each day starting on day 1 of the menstrual cycle

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### 12.3.3 Parenteral Progestogens

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- Suitable for long term family planning option
- Injectable preparations (e.g. Depo-Provera®)
- Implant preparations (e.g. Jadelle® and Norplant®, Implanon®)

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### 12.3.4 Intrauterine Devices

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- Offers long-term hormonal and non-hormonal contraception
- Not appropriate for those at high risk for STI's/PID
- Intrauterine infection (endometritis/PID) common in risky clients

## 12. Sexual and Reproductive Health

### Indications:

- Contraception for post-delivery/arbortal
- Emergency contraception after 120 hours
  - Example: Copper T 380®

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### 12.3.5 Emergency Contraception

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- Effective if taken within 120 hrs of unprotected intercourse.
- Give **COC** 4 tabs or **Levonorgestrel** 0.75mg 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 IUCD can be inserted up to 5 days of unprotected sexual intercourse.

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### 12.4 Sexual Assault

---

- Treat as emergency with empathy, make sure your client feels safe
- Collect comprehensive general and gynae history, including the circumstances of the incident
- Examine the patient thoroughly (refer to One Stop Centre Guidelines)



## 12. Sexual and Reproductive Health

- Fill the forms and inform the police and any relevant authorities
- Do tests: HTC, VDRL, pregnancy test
- Prophylactic as follows:
  - Emergency depending on age and time since incident (refer above)
  - PEP as per guideline; if HIV positive refer to HIV care clinic
  - STI prophylaxis:
    - ✓ Give **Gentamicin** 240mg or 6 mg/kg single dose IM stat
    - ✓ Give **Metronidazole** 2g stat or 5mg/kg tds for 7 days
    - ✓ Give **Benzathine Penicillin** 2.4 MU IM (adult) stat or if < 25 kg: 600,000 IU stat, > 25-35 kg 1,200,000 IU stat
    - ✓ Give **Doxycycline** 100mg bdx 7 days if breast feeding, pregnant.
    - ✓ If < 8 yrs, give:  
**Erythromycin** 12.5 mg/kg qid for 7 days
    - ✓ If > 8 yrs, give:  
**Erythromycin** 25 mg/kg qid for 7 days
- Treat other injuries as appropriate
- Offer counselling and protective custody where relevant

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## 12.5 Neonatal Problems

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### 12.5.1 Routine care of the newborn at delivery

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- Most babies require only simple supportive care at and after delivery.
  - Dry the baby with a clean towel.
  - Observe baby while drying.
  - Give the baby to the mother as soon as possible, place on chest/abdomen.
  - Cover the baby to prevent heat loss.
  - Encourage initiation of breastfeeding within the first hour.
  - Skin-to-skin contact and early breastfeeding are the best ways to keep a baby warm and prevent hypoglycaemia.

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### 12.5.2 Neonatal Resuscitation

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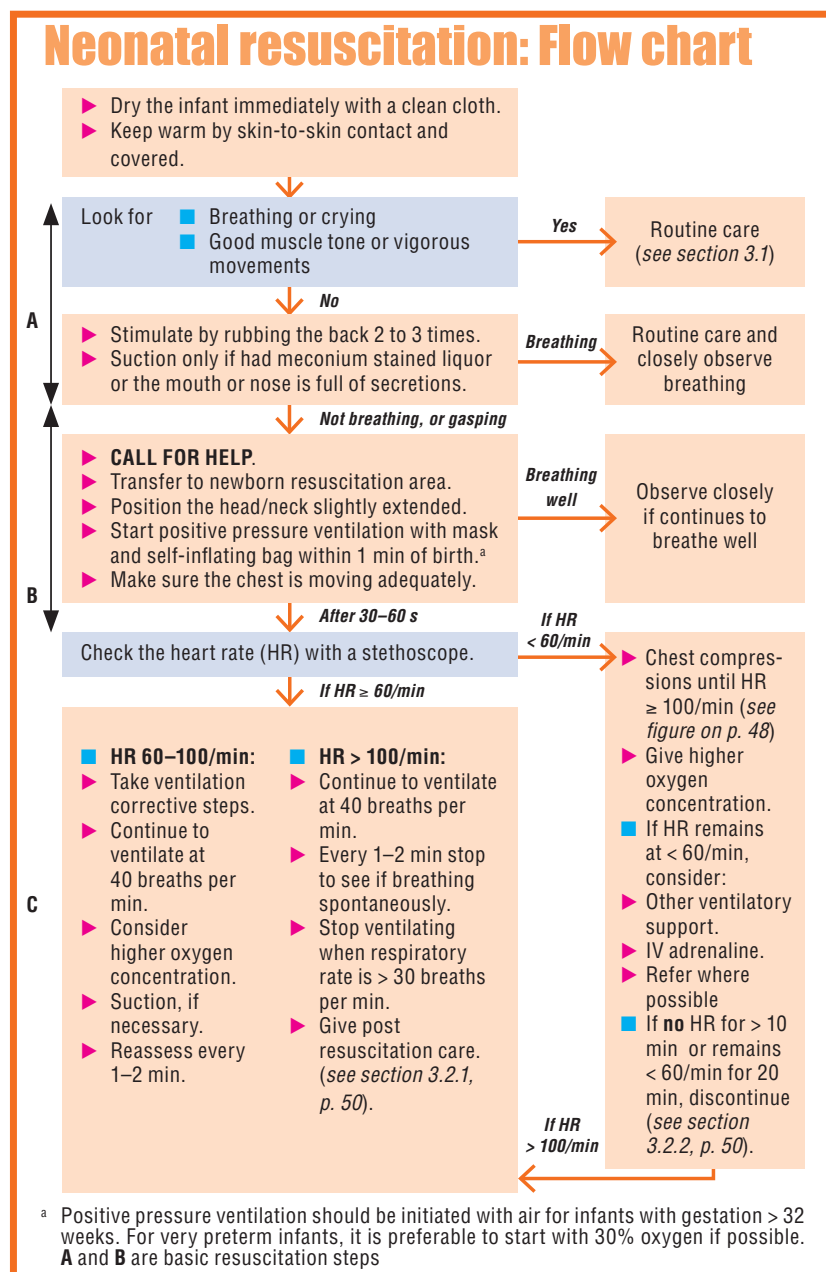
- For some babies the need for resuscitation may be anticipated
  - Those born to mothers with chronic illness
  - Where the mother had a previous fetal or neonatal death
  - A mother with pre-eclampsia, in multiple pregnancies
  - In preterm delivery
  - In abnormal presentation of the fetus

- With a prolapsed cord, or
- Where there is prolonged labour or rupture of membranes, or meconium-stained liquor.

Therefore,

- Be prepared for resuscitation at every delivery,
- Follow the assessment steps

### Cessation of resuscitation



**If after 20 minutes of resuscitation the baby is:**

- Not breathing and pulse is absent: cease efforts.
- Explain to the mother that the baby has died, and give it to her to hold if she wishes.

---

**12.5.3 Routine care for all newborn babies soon after delivery**

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- Keep dry in a warm room away from drafts, well covered
- Keep the baby with the mother, rooming in
- Initiate breastfeeding within the first hour
- Let the baby breastfeed on demand if able to suck
- Give **Vitamin K** (phytomenadione), according to national guidelines
- 1 ampoule (1 mg/0.5ml or 1 mg/ml) IM once
- (Do NOT use 10 mg/ml ampoule)
- Keep umbilical cord clean and dry
- Apply antiseptic ointment or antibiotic eye drops/ointment (e.g. **Tetracycline** eye ointment) to both eyes once, according to national guidelines
- Give oral polio, hepatitis B and BCG vaccines, depending on national
- Guidelines

---

#### 12.5.4 Prevention of Neonatal Infections

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- Many early neonatal infections can be prevented by:
  - Good basic hygiene and cleanliness during delivery of the baby
  - Special attention to cord care: use of spirit no longer recommended
  - Eye care
- Many late neonatal infections are acquired in hospitals. These can be prevented by:
  - Exclusive breastfeeding
  - Strict procedures for hand washing for all staff and for families before and after handling babies
  - Not using water for humidification in incubators (where *Pseudomonas* will easily colonize) or by avoiding incubators (using kangaroo mother care instead).

---

#### 12.5.5 Danger signs in newborns and young infants

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- Neonates and young infants often present with non-specific symptoms and signs which indicate severe illness.
- These signs might be present at or after delivery, or in a newborn presenting to hospital, or develop during hospital admission.

## 12. Sexual and Reproductive Health

- Initial management of the neonate presenting with these signs is aimed at stabilizing the child and preventing deterioration.

### *Danger Signs*

- Unable to breastfeed
- Convulsions
- Drowsy or unconscious
- Respiratory rate less than 20/min or apnoea (cessation of breathing for >15 secs)
- Respiratory rate greater than 60/min
- Perinatal Asphyxia
  - Grunting
  - Severe chest indrawing
  - Central cyanosis

### *Management*

- Give oxygen by nasal prongs or nasal catheter if the young infant is cyanosed or in severe respiratory distress.
- Start CPAP if there is no improvement
- Give bag and mask ventilation, with oxygen (or room air if oxygen is not available) if respiratory rate too slow (<20).
- Give **Ampicillin** (or **Benzylpenicillin**) and **Gentamicin**.
- If drowsy, unconscious or convulsing, check blood glucose.
- If glucose <2.2 mmol/l (<40 mg/100 ml), give **Glucose IV**.
- If you cannot check blood glucose quickly, assume hypoglycaemia and give **Glucose IV**.

## 12. Sexual and Reproductive Health

- If you cannot insert an IV drip, give expressed breast milk or glucose through a nasogastric tube.
- Give phenobarbital if convulsing.
- Admit, or refer urgently if treatment is not available at your hospital
- Give vitamin K (if not given before).
- Monitor the baby frequently.

---

### 12.5.6 Care of Low Birth Weight (<2.5kg) and Premature Babies

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- Low birth weight and premature babies are at risk of a number of problems – it is important to try and anticipate these and treat if necessary.

---

### 12.5.7 Hypoglycaemia and Feeding

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- Small babies should be fed every 3 hours.
- The daily feed volume should be calculated as below, and divided by 8 to give the 3 hourly feed volume, or divided by 12 to give 2 hourly feeds

Day	1	2	3	4	5 onwards
Amount /day	60 ml/kg	80-90ml/kg	110-120ml/kg	140-150ml/kg	150-200ml/kg

## *12. Sexual and Reproductive Health*

- If the baby shows any signs of hypoglycaemia (lethargy, floppiness, convulsions, apnoea, abnormal neurological behavior) please check the blood glucose level.
- If it is not possible to check then go ahead and treat:

### *Treatment*

- If Blood Glucose < 2.2mmol/l
  - 1ml/kg 50% **Dextrose** via NGT or
  - 5ml/kg 10% **Dextrose** IV
  - Recheck after 30 minutes to ensure the blood glucose level has improved

---

### **12.5.8 Hypothermia**

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- Prevent hypothermia by keeping in hot cot/under heater and ensuring baby is well-wrapped and wearing a hat.
- When the baby is stable, it should be nursed in 'Kangaroo' position.

---

### **12.5.9 Infection**

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- Premature delivery may be due to maternal infection.
- Have a very low threshold for starting antibiotics in premature babies. Remember that signs of sepsis in a newborn can be very non-specific.



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### 12.5.10 Respiratory Distress Syndrome

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- Very premature babies lack surfactant and therefore may have marked respiratory distress.
- Put the baby on O<sub>2</sub>, cover with antibiotics and ensure they are kept warm. For babies <1.5kg, start CPAP with any signs of distress.

---

### 12.5.11 Apnoea of Prematurity

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- Very premature babies have immature respiratory centres in the brain and sometimes 'forget' to breath.
- Use **Aminophyllin** as a respiratory stimulant for babies <34/40 gestation: 6mg/kg stat, then 2-3mg/kg twice a day.

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### 12.5.12 Neonatal Jaundice

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- For all jaundiced babies, consider whether infection may be the cause and investigate (blood culture, lumbar puncture) and treat appropriately.

#### Investigation

- Any baby who appears visibly jaundiced should have a bilirubin level.
- If the bilirubin level is greater than the value shown in the chart below, the baby should be started on phototherapy.
- If no bilirubin measurement available, start phototherapy if jaundice extends to extremities.

### Phototherapy treatment thresholds for jaundiced babies

	Healthy Term Baby	Preterm, LBW, Sick
Day Of Life	mg/dl	mg/dl
Day 1	Treat any visible jaundice with phototherapy	
Day 2	15	13
Day 3	18	16
Day 4 and after	20	17

### Once Under Phototherapy

- Ensure the baby is feeding well – top up with EBM via cupt or NGT if necessary.
- Babies under phototherapy should have their bilirubin level checked on a daily basis.
- Phototherapy should be stopped when the value is more than 3mg/dl below the threshold shown above.

### Other Problems:

- Patent Ductus Arteriosus
  - Suspect in the premature baby with full pulses and a blowing systolic murmur.

## *12. Sexual and Reproductive Health*

### *Treatment*

- Give **Ibuprofen** 10mg/kg Day 1, 5mg/kg Day 2 and Day 3.
- Necrotising enterocolitis
  - Suspect if abdominal distension, tenderness, bile stained vomitus, bloody stool, 'septic appearance'.

### *Management*

- Order abdominal Xray,
- Inform surgeons
- Keep NPO
- Begin treatment with **Ceftriaxone** and **Metronidazole**.

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## 13.0 Ophthalmic Conditions

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### 13.1 Conjunctivitis

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#### *Presentation*

- Foreign body sensation, burning, tearing, redness, photophobia and discharge. Usually bilateral though one eye may become affected 1-2 days later. On waking the eyelids are frequently stuck together and difficult to open.
- Purulent discharge, and lid oedema in infective causes

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#### 13.1.1 Allergic Conjunctivitis

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#### **Treatment**

- Avoid triggers when identified
  - **Mild**
    - ✓ Artificial tears e.g. **Hypromellose** and **Viscotears** tds
    - ✓ Cool compresses over the eyelids
  - **Moderate**
    - ✓ **Mast cell stabilizers (Sodium Cromoglycate 2% qid, Nedocromil Sodium 2% BD ) and Antihistamines (Emedastine bd or qid)**
    - ✓ Combined antihistamines and mast cell stabilizers (**Ketotifen** bd) can also be used

## 13. Ophthalmic Conditions

### ➤ Severe

- ✓ Treat as moderate disease and a short course of low potent steroid such as **Fluorometholone** 0.1% tds, otherwise **Dexamethasone** 0.1% gutt tds may be used
  1. Consider using **Acyclovir** 200mg 5x/day or 400mg bid in patients on prolonged immunosuppressants.

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### 13.1.2 Bacterial Conjunctivitis

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#### Treatment

- Eyelids to be cleaned of discharge before using topical antibiotics
- Eye drops include **Chloramphenicol** 0.3%, **Ciprofloxacin** 0.3%, **Ofloxacin**, and, **Moxifloxacin** 0.3% maybe used.
- Eye ointments such as **Chloramphenicol** and **Tetracycline** provide higher concentrations for longer periods than drops but inappropriate for day use because of blurred vision.

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### 13.1.3 Ophthalmia Neonatorum

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#### Key Diagnostic features

- This is conjunctivitis developing within the first month after birth as the result of infection transmitted from mother to infant during delivery.

### 13. Ophthalmic Conditions

#### Prophylaxis

- Give **Povidone-iodine** 2.5% (a cheap and effective agent against all of the common pathogens that cause Ophthalmia neonatorum).
- Give **Erythromycin** 0.5% ointment or **Tetracycline** 1% ointment

#### Treatment

- Give **Erythromycin** elixir 50mg/kg/day for 14 days with **Erythromycin** ointment or **Tetracycline** ointment qid (to treat Chlamydial infection).
- If Pneumonitis is suspected, treat for 3 weeks, and also treat the mother and her sexual partner.
- For Gonococcal infection,
  - Give **Ceftriaxone** 25-50mg/kg IV or IM for 7 days or **Cefotaxime** 100mg/kg IV or IM for 7 days
- Other bacterial infections
  - Give **Chloramphenicol** or **Neomycin** eye ointment qid
  - Systemic antibiotics may be considered in severe cases.
- For suspected Herpes simplex virus infection
  - Give **Acyclovir** 45-60mg/kg in 3 divided doses for 14 days and topical **Acyclovir** 5 times daily.

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## 13.2 Keratitis

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### 13.2.1 Bacterial Keratitis

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*Key diagnostic features*

- *Risk factors* include contact lens wear, trauma, ocular surface disease (such as herpetic keratitis, bullous keratopathy, and dry eyes), chronic blepharitis, trichiasis, and exposure keratopathy, severe allergic eye disease and corneal anaesthesia).
- *Other factors* include topical or systemic immunosuppression such as diabetes, vitamin A deficiency and measles.

*Presentation*

- Painful red eyes, with a purulent discharge, with circumlimbal injection and with corneal opacities  $\pm$  oedema  $\pm$  anterior uveitis
- May complicate with limbal and scleral extensions, corneal perforations and endophthalmitis

*Treatment*

- **Topical antibiotics**
  - Initially at hourly intervals day and night for up to 48 hours. Later reduced to 2-hourly during waking hours for a further 48 hours then qid for 7 days or until the epithelium has healed.

### 13. Ophthalmic Conditions

- Consider using eye ointments eg **Chloramphenicol** eye ointment 2% or **Tetracycline** eye ointment 2%
- **Oral antibiotics**
  - Give **Ciprofloxacin** 750mg bd 7-10 days or **Augmentin** 625mg bd 7-10 days (in threatened or actual corneal perforation or a peripheral ulcer in which there is scleral extension, for isolates for which there are potential systemic complications e.g *N. Meningitides*).
- **Subconjunctival antibiotics**
  - Only indicated if there is poor compliance with topical treatment.
- **Cycloplegics** (Atropine 1% gutt bd or **Cyclopentolate** 1% gutt tds).
- **Topical steroids** therapy to reduce corneal scarring ONLY after the ulcer has been sterilized and fungal infection has been excluded.

#### RED FLAGS:

- Consider using a bandage contact lens in impending or actual corneal perforation
- Counsel patient and guardians on visual prognosis



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### 13.2.2 Viral Keratitis

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#### *Treatment of epithelial keratitis*

- Give **Acyclovir** 3% ointment five times daily.
- Debridement may be used for dendritic but not geographic ulcers.
- The majority of dendritic ulcers will eventually heal spontaneously without treatment.

#### *Treatment of Disciform Keratitis*

- Initially with topical steroids (**Prednisolone** 0.5% eye drops) with **Acyclovir** 5% eye ointment both qid for 4 weeks, then tapering of both can be done
- A weak steroid such **Fluorometholone** 0.1% on alternate days maybe used subsequently for several months

#### *Treatment of Stromal Necrotic Keratitis*

- Lowest effective topical steroid therapy to control inflammation
- Topical **Acyclovir** 5% eye ointment five times a day
- Oral **Acyclovir** (400mg bd for a year) to reduce the rate of recurrent epithelial and stromal keratitis. The benefit is greatest in patients with frequent debilitating bilateral disease or if involving an only eye

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### 13.2.3 Fungal Keratitis

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#### **Treatment**

- Epithelium debridement over the lesion enhances penetration of antifungal agents.
- Local treatment initially hourly for 48 hours and then reducing as signs permit.
- Use topical **Natamycin** 5% gutt or **Econazole** 1% gutt **Amphotericin B** 0.15% for either filamentous or candida infections.
- Subconjunctival Fluconazole may be used in severe cases with hypopyon.
- Systemic anti-fungals may be required for severe keratitis or endophthalmitis such as daily **Fluconazole** 100mg for a week
- Cycloplegics (**Atropine** 1% gutt bd or **Cyclopentolate** 1% gutt tds.
- A broad spectrum antibiotic should also be used as bacterial co-infection is common

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### 13.3 Immune-Mediated Uveitis

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#### **Treatment**

- Treatment of immune-mediated uveitis involves predominantly the use of anti-inflammatory and immunosuppressive agents.
- Mydriatics
  - **Tropicamide** (0.5% and 1%),  
**Cyclopentolate** (0.5% and 1%),

### 13. Ophthalmic Conditions

- **Phenylephrine** (2.5% and 10%), and **Atropine** 0.5% to 1%
- Steroids
  - Topical steroids useful only for anterior uveitis because therapeutic levels are not reached behind the lens.
  - Periocular steroids
    - ✓ Therapeutic concentrations maybe achieved behind the lens e.g. **Triamcinolone Acetonide** (Kenalog) and depot steroids such as **Methylprednisolone Acetate** (Depomedrone).
  - Intraocular steroids
    - ✓ Intravitreal injection of **Triamcinolone Acetonide** (4mg in 0.1ml) or Slow-release steroid implant (**Flucinolone Acetonide**) via pars plana. Useful in patients with posterior uveitis.
  - Systemic steroids
    - ✓ Give oral **Prednisolone** 1mg/kg
    - ✓ Intravenous injection of **Methylprednisolone** 1g/day for 3 days.

### 13. Ophthalmic Conditions

- Antimetabolites
  - Give **Azathioprine** 1mg/kg/day od or in divided doses. Double dose after 1-2 weeks. For Sight-threatening uveitis and as a steroid-sparing therapy in patients with intolerable side effects from systemic steroids
  - Give **Methotrexate** 10-15mg/week (children can be given 30mg/week) as a steroid-sparing agent in patients with uveitis associated with Sarcoidosis. **Folic Acid** 2.5-5.0mg/day is co-administered to reduce bone marrow toxicity. Patients must refrain from alcohol.
  - Give **Mycophenolate Mofetil** 1g bd which may be increased to 4g daily. A good alternative to azathioprine in unresponsive or intolerant patients. Contraindicated in children. Monitoring involves a weekly full blood count for 4 weeks and then monthly.

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### 13.4 Cytomegalovirus (CMV) Retinitis

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- Ascertain HIV status and CD4 count. Consider drug failure or drug noncompliance

#### *Systemic treatment*

- Either of the following may be used in the treatment of CMV Retinitis
  - Give **Ganciclovir** 5mg/kg IV BD for 2-3 weeks, then 5mg/kg od during the induction phase. Oral **Ganciclovir** 300-450mg daily for prophylaxis and maintenance maybe given when retinitis is stable until CD4 count is more than 100-150 cells/ $\mu$ l. Ganciclovir is marrow toxic and hence the need for regular FBC checks.
  - Give **Foscarnet** 60mg/kg tds for up to 3 weeks for induction and 90-120mg od for maintenance. Foscarnet is nephrotoxic and causes electrolyte imbalances and seizures.
  - Give **Valganciclovir** 900mg bd in the induction phase and 900mg od in the maintenance phase.

#### *Intravitreal treatment*

- Intravitreal injections
  - **Ganciclovir 4mg** in 0.05ml
- Give **Ganciclovir** slow-release device (**Vitrasert**) effective for about 60 days.

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## 13.5 Endophthalmitis

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- **Endogenous Bacterial Endophthalmitis**
  - The choice of agents is dependent of on culture and sensitivity results
  - Empirically treat endophthalmitis with systemic infection with **Ceftazidime** 1g bd and **Vancomycin** 1g bd for 2-3 weeks
  - Isolated endophthalmitis is treated with oral **Ciprofloxacin** 750mg bd for 7-14 days and intravitreal antibiotics as in postoperative endophthalmitis below.
  
- **Postoperative Bacterial Endophthalmitis**
  - Intravitreal antibiotics are the key to management.
  - **Empirical Intravitreal Injections**
    - ✓ Give **Vancomycin** (2mg in 0.1ml) and **Ceftazidime** (2mg in 0.1ml) OR
    - ✓ Give **Vancomycin** (2mg in 0.1ml) and **Amikacin** (0.5mg in 0.1ml)
  - **Periocular Antibiotic Injections**
    - ✓ Give **Vancomycin** 25 mg in 0.5 ml and **Ceftazidime** 100 mg in 0.5 ml OR
    - ✓ Give **Vancomycin** 25 mg in 0.5 ml and **Amikacin** 25 mg in 0.5 ml

### 13. Ophthalmic Conditions

OR

✓ Give **Vancomycin** 25 mg in 0.5 ml and **Gentamycin** 20 mg in 0.5 mL

➤ **Oral Antibiotics** (Oral antibiotics are of uncertain benefit).

✓ Give **Fluoroquinolones** (eg **Ciprofloxacin** 750mg b.d for 10 days) have a better penetration of the eye

➤ **Steroids**

✓ Topical **Dexamethasone** 0.1% qid OR

✓ Oral steroids. High dose **Prednisolone** can be given if fungal infection has been excluded.

✓ Periocular steroids eg **Dexamethasone** 6 mg in 0.25 ml OR **Triamcinolone** 1mg should be considered if systemic steroids are contraindicated

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## 13.6 Glaucoma

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- This is an optic neuropathy with a characteristic visual fields defects

---

### 13.6.1 Primary Open Angle Glaucoma

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#### *Medical Treatment*

- Prostaglandin analogues – the first line treatment, avoid in uveitis
  - **Travoprost** 0.004% (Travatan) od
  - **Latanoprost** 0.005% (Xalatan) od
  - **Bimatoprost** 0.03% Lumigan
- Beta adrenergic antagonists, contraindicated in Asthma
  - Selective  $\beta$  1 antagonists
    - ✓ **Betaxolol** 0.5% bd
  - Non Selective  $\beta$  antagonists
    - ✓ **Timolol** 0.5% bd
  - Alpha 2 adrenergic agonists
    - ✓ **Brimonidine** 0.2% tds
  - Carbonic anhydrase inhibitors
    - ✓ Systemic
      - **Acetazolamide** 125 – 250mg qid
    - ✓ Topical
      - **Brinzolamide** 1% (Azopt) bd
      - **Dorzolamide** 2% (Trusopt) tds
- Parasympathomimetics (Cholinergics)
  - **Pilocarpine** 2%, 4% qid gel or drops



## 13. Ophthalmic Conditions

### *Surgical Treatment*

- Trabeculectomy – when maximal medical treatment is suboptimal in IOP control
- Consider transcleral cyclophotocoagulation in eye with poor visual potential

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### **13.7 Chemical Injury**

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- Treat and ask questions later
- Prognostic features of chemical corneal injuries depend on
  - The pH – alkalis are more damaging than acids
  - Duration of contact
  - Corneal involvement
  - Limbal involvement
  - Associated non chemical injury such as thermal injury and blunt trauma
  - Conjunctival involvement

### *Treatment*

- Immediate irrigation with water or 2 litres of normal saline until pH is normalized
- Double evert the upper eye lids and remove any retained particulate matter
- Repeat pH after 20 minutes, if abnormal repeat the irrigation
- Daily pH tests, any derangements may indicate the presence of retained chemical particulates and warrants further irrigations and forniceal inspection

### 13. Ophthalmic Conditions

#### Acute management:

- Use preservative free drugs where possible
  - Preservative free topical antibiotics eg **Chloramphenicol** 0.5% QID
  - Topical cycloplegia eg **Atropine** 1% ocular BD
  - Topical lubricants eg **Carmellose** 1 hourly
  - Oral analgesia

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#### 13.7.1 Severe Chemical Injuries

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- Admit
- Give
  - Topical steroids eg **Prednisolone** 1% 2-3 hourly for < 10 days –
  - Topical ascorbic acid – **Sodium Ascorbate** 10% 2 hourly for < 10 days
  - Give **Oral Ascorbic Acid** 1g bd
  - Systemic **Tetracyclines** 100mg od for 3 months
  - Give **Acetazolamide** 250mg qid ± **Timolol** 0.5% bd
  - Patients need to be counselled for long term follow up to manage complications

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## 13.8 Orbital Cellulitis

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### *Key diagnostic features*

- This is an ophthalmic emergency.
- Risk factors include sinus disease, traumatic orbital septal perforation and post orbital surgery
- Symptoms; fever, periorbital pain, inflamed eye lids, proptosis, restricted and painful extraocular movements, poor visual acuity, RAPD, reduced color vision
- Investigations
  - FBC, BC, CSF analysis if meningeal or cerebral signs develop
  - CT scan of the orbits, paranasal sinuses and brain

### *Treatment*

- Hospital admission
- ENT assessment is mandatory.
- Antimicrobial therapy
  - **Ceftazidime** 1g IV q8h and **Metronidazole** 500mg IV q8h. Therapy should be continued until the patient is afebrile for 4 days.
- Optic nerve function monitoring
- Visual acuity, color vision, pupillary reactions, and light brightness appreciation.
- Surgical intervention should be considered in orbital or subperiosteal abscesses, unresponsiveness to antibiotics and in decreasing vision.

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## 14.0 Oral and Maxillofacial Conditions

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### 14.1 Candidiasis/Oroesophageal

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- Give **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 tds for 7 days
- Give **Clotrimazole Troches** 10 mg tds for 4 weeks (children)

*Alternatively*

- Give **Chlorhexidine** 0.2% mouth rinses tds (should **not** be used together with **Nystatin**)
- *If not resolved after 7 days:*
- Continue with above treatment and add **Ketoconazole** 200-400 mg bd for 10-14 days
- Children: 1-4 years: Give **Ketaconazole** 50 mg bd for 10 – 14 days
- 5-12 years: Give **Ketaconazole** 100 mg bd for 10 -14 days

**Note:**

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

*Adults*

Give **Fluconazole** 50-100 mg qid for 14 days

*Children*

Give **Fluconazole** 6 mg/kg on day 1, then 3 mg/kg qid for 13 days

*Prophylaxis:*

*Adults*

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

*Children*

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

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## 14.2 Caries, Toothache

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*Treatment*

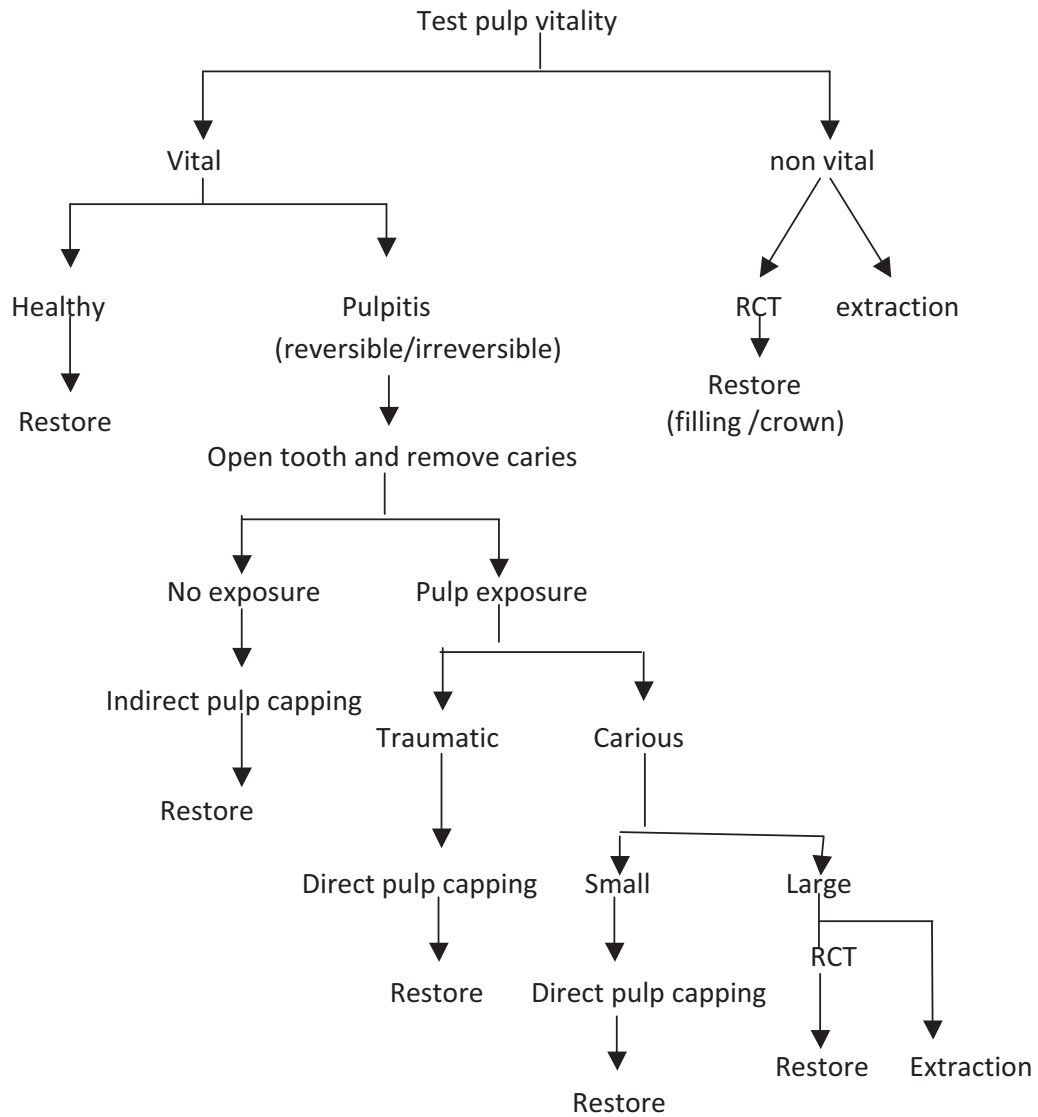
- Depends upon the extent of caries and clinical judgment:
  - *If minimal and confined to the enamel*
    - ✓ Apply topical **Fluoride**
  - *If in enamel and dentine but not involving the pulp*
    - ✓ Filling

#### *14. Oral Maxillofacial Conditions*

- *If involving the pulp and there is periapical infection and/ or pulp inflammation*
  - ✓ Root Canal Therapy
- *If severe*
  - ✓ Tooth extraction

## 14. Oral Maxillofacial Conditions

### • ALGORITHM FOR TREATMENT OF CARIOUS LESION



**Note:**

- Antibiotics are not indicated unless there is infection
- Reinforce oral hygiene practices including use of fluoridated toothpaste to all patients

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**14.3 Dental Abscess**

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*Treatment*

- Consider incision and drainage
- Give **Amoxicillin** 250-500 mg tds for 7 days  
*and*
- Give **Metronidazole** 200-400 mg (Children:7.5 mg/kg/dose ) tds for 7 days or
- Give **Benzyl Penicillin** 1-2 MU (Children: 25,000 units/kg/dose) IM or IV q6h for 7 days and
- Give **Metronidazole** 250-500 mg IV q8h for 7 days
- Give **Aspirin** 300 – 600 mg tds
- If abscess persists after 2 weeks , do culture and sensitivity
- Remove source of infection :
  - Extraction of infected tooth
  - Root canal therapy /Apicectomy /Apicectomy

*Alternatively*

- Give **Erythromycin** 250-500 mg qid for 7 days (if allergic to penicillins) and
- Give **Paracetamol** 1g tds for adults  
Children give **Paracetamol** 250mg tds



## 14. Oral Maxillofacial Conditions

- Give **Brufen** 400mg tds for adults (if **Paracetamol** is ineffective)  
Children give **Brufen** 200mg tds (if **Paracetamol** is ineffective)

**Note:** For moderate to severe pain, refer to pain management ladder

---

### 14.4 Gingivitis

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#### *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
- Gargle with antibacterial mouthwash twice a day until symptoms resolve
- Antibiotics are **not** indicated unless one has Acute Necrotizing Ulcerative Gingivitis (ANUG) or Linear Gingival Erythema (LGE)

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### 14.5 Periodontal abscess

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#### *Treatment*

- Give antibiotics as for dental abscess
- Reinforce oral hygiene practices
- Antibacterial mouthwash
- Scaling and/or root planing
- Topical fluoride application

## 14.6 Periodontitis

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### *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

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### *Signs and Symptoms*

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

### *Treatment*

- Ensure airway patency
- Culture and sensitivity
- Incision and drainage

## 14. Oral and Maxillofacial Conditions

- 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 (2-3L Fluids/24 hours for maintenance)
- Give analgesics for pain relief
- Encourage high-calorie food intake
- Prescribe appropriate antibiotics for rapidly progressive swelling as follows:
  - Give **Amoxicillin** 250-500mg tds for 7days *or* **Benzympenicillin** 0.5-2.0 MU IM or IV q6h for 7days
  - Give **Metronidazole** 200-400mg tds or 7days *or* **Metronidazole** 250-500mg IV q8h for 7 days
  - Give **Tetracycline** 250mg every six hours or 500 mg twelve hourly for 7 days
  - Give **Erythromycin** 250-500 mg qid for 7 days
  - Give **Clindamycin** 150-300 mg

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

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### 14.7.1 Salivary Gland Disease

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- Retention cysts, thyroglossal duct cysts, brachial cleft cysts, enlargements etc.

## 14. Oral and Maxillofacial Conditions

### Treatment

- Surgical procedure (if indicated)
- Give **Ciprofloxacin** 250 – 500 mg bd for at least 5 days plus
- Give **Metronidazole** 200 – 400 mg tds for at least 5 days if there is infection

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### 14.7.2 Trigeminal and Glossopharyngeal Neuralgia

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#### Signs and Symptoms

- Unilateral pain with *trigger zone*

#### Treatment

- Give **Carbamezepine** 600-1,600mg nocte for a month then review
- Give **Phenytoin** 300-500mg tds per day
  - Can be administered by IV for severe TN pain
- Give **Gabapentin** 300mg tds
- Give **Baclophen** 5mg bd or tds a day which can be increased
  - Usual effective dose is 50-60mg per day
  - Can be used alone or in combination with **Carbamezepine**

**Note:** If trigeminal neuralgia persists after 2 months refer to neurosurgery

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## **14.8 Local Anaesthesia Toxicity in Dental Surgery**

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### **14.8.1 Mild Local Anaesthetic toxicity**

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*Signs and Symptoms*

- Talkativeness, anxiety, slurred speech, confusion

*Treatment*

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

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### **14.8.2 Moderate Local Anaesthetic toxicity**

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*Signs and Symptoms*

- 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:**

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*Signs and Symptoms*

- Seizure, cardiac dysrhythmia or cardiac arrest

*Treatment*

- Place in supine position
- If seizures, protect from nearby objects,
- Suction oral cavity if vomiting occurs

## 14. Oral and Maxillofacial Conditions

- Administer oxygen
- Give **Diazepam** 5-10 mg IV slowly as stat dose
- Transport to emergency care facility / intensive care unit
- Monitor vital signs
- Summon for medical assistance

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### 14.9 Mouth Ulcers (Sores)

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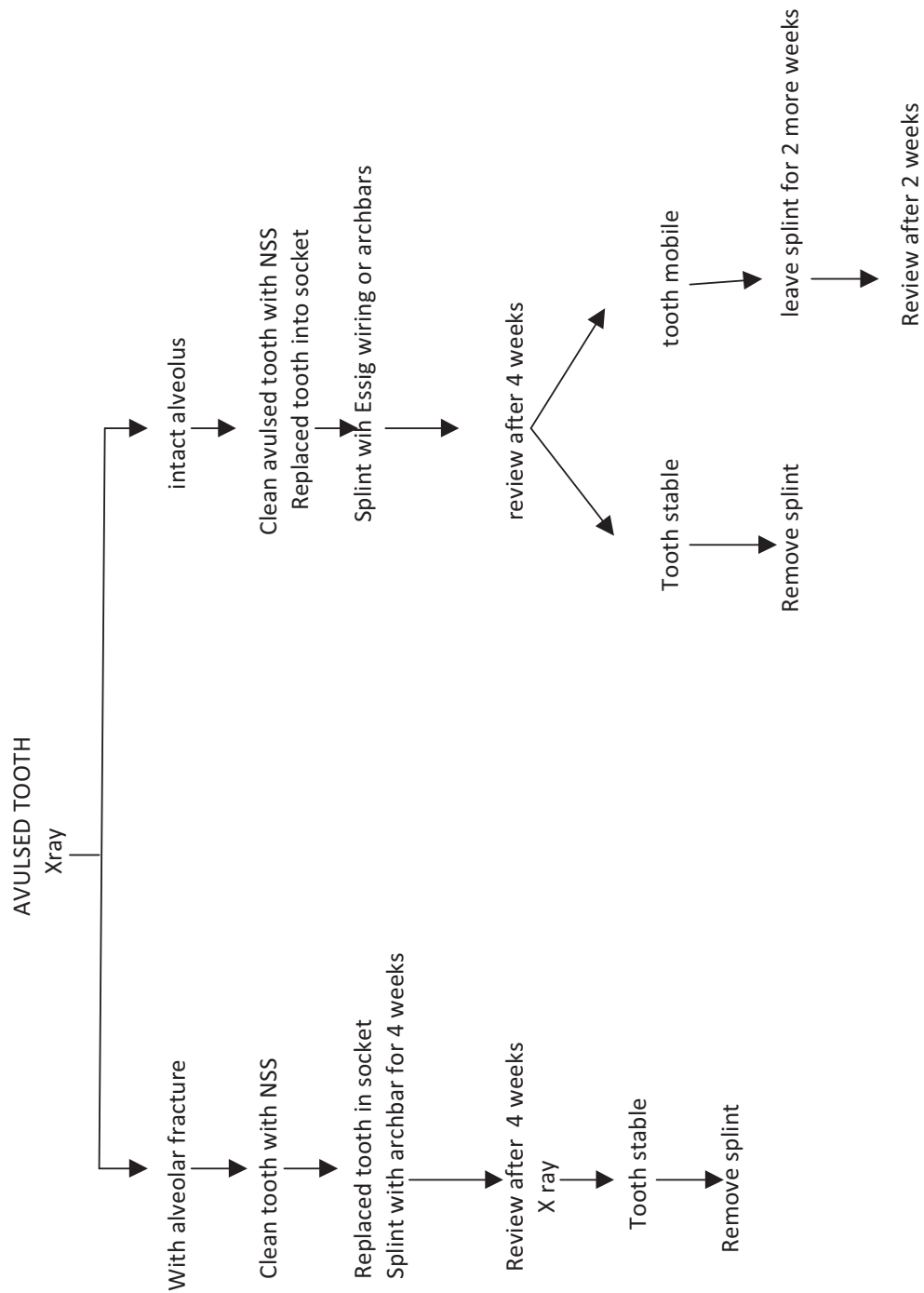
- If related to HIV infection, please refer to section on *Management of the HIV-Related Diseases*,
- All ulcers in the mouth regardless of the HIV-status, lasting more than three weeks, should be referred for further management

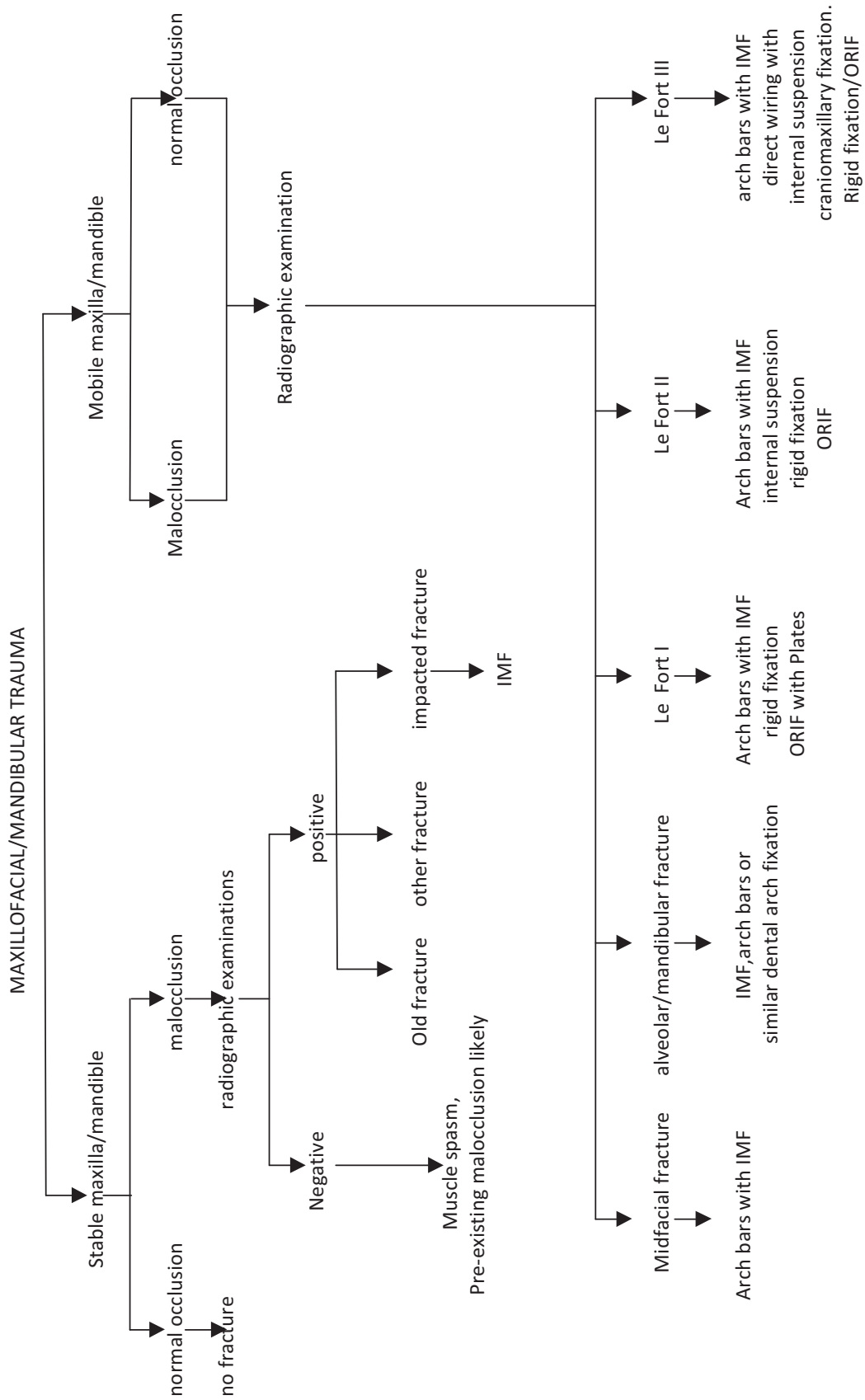
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### 14.10 Oral Trauma

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- Clean the area with NSS
- Check for fractures and break in the skin or mucosa ....treat accordingly
- Sutures and simple fractures can be treated under local anesthesia
- Complex and complicated fractures maybe treated under LA and premedicated with pethidine 100mg IM for 18 years and above
- Fractures not suited under local anesthesia must be treated under general anesthesia



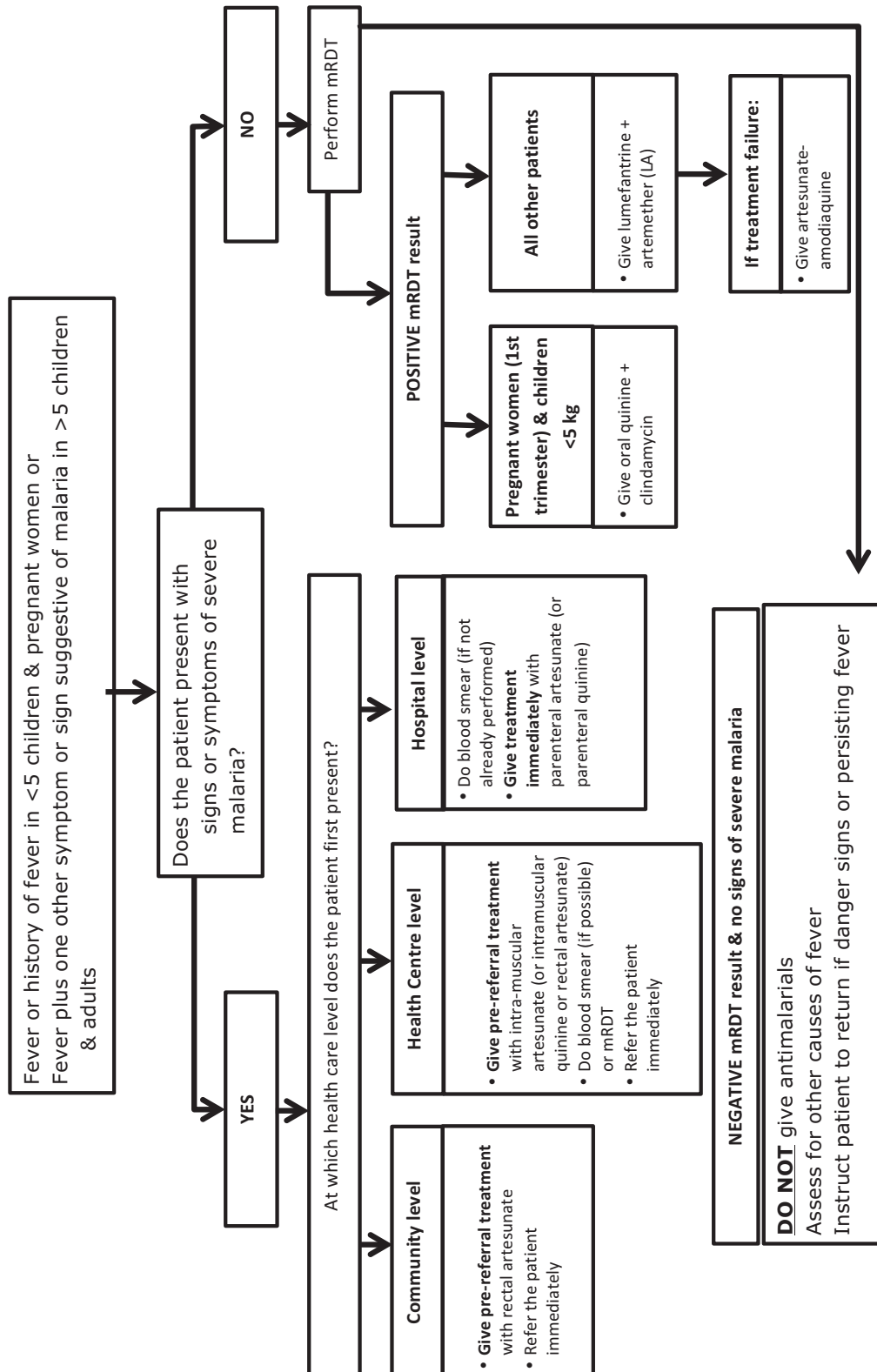




## 15.0 Parasitic diseases

### 15.1 Malaria

#### Flow Chart for the Diagnosis and Treatment of Malaria



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### 15.1.1 Malaria, non-severe, uncomplicated

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- Refer to the MOH National Malaria Control Programme Revised **Guidelines for the Treatment of Malaria in Malawi, July 2013**, for full details of malaria management

#### *Signs and Symptoms*

- Fever or recent history of fever in pregnant women or children under the age of five years and fever or history of fever plus one other symptom or sign suggestive of malaria in over five children and adults

#### *Diagnosis*

- All suspected uncomplicated malaria cases at all levels of the health care delivery system should be tested using malaria rapid diagnostic tests (mRDTs) or by microscopic examination of blood film wherever possible
- Testing (film or mRDT)
- Repeat diagnostic test (film or mRDT) if:
  - the first test was positive and there is persistent fever or worsening condition despite suitable antimalarial treatment

## 15. Parasitic diseases

- the first test was negative and antimalarial treatment was not given, but the patient's fever persists or condition deteriorates

### *Treatment*

- In the event that both mRDT and microscopy are not available, treat on the basis of presumptive diagnosis

### *First-Line Treatment*

- Give **Lumefantrine 120mg/Artemether 20mg (LA)**
  - Lumefantrine-artemether comes in two oral formulations:
    - Non-dispersible **LA** [LA(ND)] for older children weighing 25kgs or more including adults and
    - Dispersible **LA** [LA(D)] for children weighing from 5kg to less than 25kg
- Note:** If LA(D) is not available, LA(ND) can be used to treat children weighing from 5kg to less than 25kg

**Dosage Schedule for dispersible (D) and non-dispersible (ND) 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
LA(D) 5-14.9 kg (<3)	1	1	1	1	1	1
LA(D) 15-24.9 kg (≥ 3-8)	2	2	2	2	2	2
LA(ND) 25-34.9 kg (≥9-14)	3	3	3	3	3	3
LA(ND) ≥ 35 kg (>14)	4	4	4	4	4	4

## *15. Parasitic diseases*

- First dose should be given as DOT. If vomiting occurs within 30 minutes, 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 malaria microscopy, and if the result is positive, give second line treatment  
In patients with contraindications or intolerance to LA give second line treatment

### **Second-Line Treatment**

- Give **Artesunate** 4 mg/kg/day and **Amodiaquine** 10 mg/kg/day od for 3 days

15. Parasitic diseases

**Dosage schedule for fixed combination dose of artesunate-amodiaquine**

<b>Body Weight (kg)</b>	<b>Age</b>	<b>Daily dose for 3 days artesunate-amodiaquine</b>	<b>Preparation strength per tablet</b>
5.0 – 8.9	2 – 11 months	1 tablet	25 mg/67.5 mg
9.0 – 17.9	1 – 5 years	1 tablet	50 mg/135 mg
18.0 – 35.9	6 – 13 years	1 tablet	100 mg/270 mg
≥ 36	14 years old and above	2 tablets	100 mg/270 mg

**Note:**

- Treatment failure to first line treatment (LA) should be suspected if symptoms persist or the patient clinically deteriorates three to 14 days after initiation of LA drug therapy
- Side effects: Transient rise in transaminases and transient reduction in white blood cell count. The dosing schedule is indicated in Table 1.4 below
- Pregnant women in the first trimester with a confirmed treatment failure to quinine plus clindamycin should be treated with LA

**If pregnant and in first trimester and children weighing < 5kg**

- Give oral **Quinine** plus **Clindamycin**
- The table below shows the recommended dosages for oral Quinine and Clindamycin:

**Dosage schedule for oral Quinine plus Clindamycin**

<b>Population</b>	<b>Recommended dosage</b>
Pregnant women in the 1st trimester	Quinine tablets 600 mg tds for 7 days plus Clindamycin tablets 300 mg tds for 7 days
Children < 5 kg	Quinine (10 mg salt/kg body weight) tds for 7 days plus Clindamycin (20 mg base/kg body weight) tds for 7 days

*Second Line Treatment in pregnancy during first trimester*

## 15. Parasitic diseases

- If confirmed treatment failure to quinine plus clindamycin, mother should be treated with LA

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### 15.1.2 Severe Malaria

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- Most severe malaria occurs in children under 5 years of age
- Severe malaria is a medical emergency and as such treatment should begin immediately, whether the patient presents at the community, health centre, or hospital level
- Suspect severe malaria if a patient has one or more of the following conditions (mostly seen in combination):

#### Clinical manifestations and some laboratory findings

Clinical manifestations	Some laboratory findings
<ul style="list-style-type: none"><li>• Impaired level of consciousness (cerebral malaria)</li><li>• Respiratory distress (acidotic breathing)</li><li>• Repetitive convulsions</li><li>• Circulatory collapse</li><li>• Pulmonary oedema</li><li>• Prostration</li><li>• Excessive or persistent vomiting</li></ul>	<ul style="list-style-type: none"><li>• Severe anaemia: (Hb &lt; 5 g/dl) (i.e. Hb &lt; 5 g/dl or Hct &lt; 15 %)</li><li>• Hypoglycaemia: (&lt; 2.2 mmol/l or &lt; 40 mg/dl)</li><li>• Hyperlactataemia (lactic acidosis) (blood lactate &gt; 4 mmol/l)</li><li>• Electrolyte imbalance (hyponatraemia)</li><li>• Acute kidney injury (serum creatinine &gt; 265 µmol/l)</li><li>• Haemoglobinuria</li></ul>



## 15. Parasitic Diseases

<ul style="list-style-type: none"><li>• Extreme pallor</li><li>• Shock (weak pulse, cold extremities)</li><li>• Jaundice (yellowish coloration of eyes)</li><li>• Little or no urine output (think about acute kidney injury)</li><li>• Very dark coloured urine</li><li>• Spontaneous bleeding (mouth, nose, skin, eyes)</li></ul> <p>Hypovolaemia</p>	
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- 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

### Note:

- Patients with hyperparasitaemia: 4+ (40,000 – 400,000/ $\mu$ l or ring stage  $\geq$  5% of RBCs) who do not have any of these indicators of severe (disease) malaria should be admitted for observation. Treat with first-line antimalarial (LA).

## 15. Parasitic Diseases

- If severe malaria is diagnosed in an out-patient, refer the child for hospitalization (see below)

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### 15.1.2.1 Pre-referral treatment at Community level

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- Refer any patient with severe malaria to the nearest hospital

#### *Treatment*

- Give **Rectal Artesunate** at 10 mg/kg body weight in a single dose, followed as soon as possible by definitive therapy for severe malaria at a hospital
- In the event that **Artesunate Suppository** is expelled from the rectum within 30 minutes of insertion, a second suppository should be inserted
- If referral is not possible within 12 hours, a second dose of **Rectal Artesunate** should be administered at 12 hours after the initial dose, then once in every 24 hours until patient is transferred to a hospital

### Initial (pre-referral) Dosage of Artesunate Suppositories for patients aged $\geq 16$ yrs

Weight (kg)	Artesunate dose	Regimen (single dose)
<40	10 mg/kg bw	Use appropriate no. of 50 mg rectal suppositories
40 – 59	400 mg	Two suppositories of 200 mg each
60 – 80	800 mg	Four suppositories of 200 mg each
>80	1200 mg	Six suppositories of 200 mg each

**Note:**

- For children, hold the buttocks together for 10 minutes to ensure retention of the rectal dose
- Treatment with **Rectal Artesunate** is suboptimal and every effort should be made to refer the patient as soon as possible
- The table below shows the recommended pre-referral doses of **Artesunate Suppositories** for children aged <16 years
  - As in adult patients, if referral is not possible within 12 hours, a second dose of **Rectal Artesunate** should be administered at 12 hours after the initial dose

- Thereafter the dose may be repeated every 24 hours. Refer to the malaria treatment guidelines for RA insertion procedure

**Initial (pre-referral) Dosage of Artesunate Suppositories for Children Aged 2months –15 Years (and weighing at least 5 kg)**

<b>Weight (kg)</b>	<b>Age</b>	<b>Artesunate dose (mg)</b>	<b>Regimen (single dose)</b>
5 – 8.9	2 – 12 months	50	One 50 mg suppository
9 – 19	13 – 42 months	100	Two 50 mg suppositories
20 – 29	43 – 60 months	200	One 200 mg suppository
30 – 39	6 – 13 years	300	One 200 mg suppository + Two 50 mg suppositories
>40	>14 years	400	Two 200 mg suppositories

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**15.1.2.1 Pre-referral treatment at Health Centre Level**

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*Treatment*

- Give **Artesunate** 2.4 mg/kg (0.12 ml/kg) IM
  - **Artesunate** should be given by intramuscular injection into the upper-outer quarter of anterior thigh and **should not** be injected into the buttocks
  - To administer IM **Artesunate**, weigh the patient and determine the number of vials needed for treatment as per the table below:

**Number of Required Vials of Parenteral Artesunate by Body Weight**

<b>Weight</b>	<b>60 mg vials required</b>
5 kg – 25 kg	1
26 kg – 50 kg	2
51 kg – 75 kg	3
76 kg – 100 kg	4

- Each 60 mg vial of injectable **Artesunate** must be reconstituted with 1 ml of **Sodium Bicarbonate**
- Dilute the **Artesunate-Bicarbonate** mixture with 2 ml of 5% **Dextrose Solution** or **Normal Saline** (0.9% **Sodium Chloride**) to produce a 20 mg/ml solution

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- Withdraw the appropriate volume in a syringe ( $[2.4 \text{ mg} \times \text{body weight in kg}] / 20 \text{ mg/ml}$ ) for intramuscular injection, rounding to the next whole number in milliliters
- Administration of pre-referral IM **Artesunate** should be followed as soon as possible by definitive therapy for malaria at a hospital
- If referral is not possible within 12 hours, a second dose of IM **Artesunate** should be administered at 12 hours after the initial dose
- If referral is still not possible after 24 hours, a third dose of IM **Artesunate** should be given

### *Alternatively*

- If IM **Artesunate** is unavailable or contraindicated, treat with high dose **Quinine** IM, administered in the thigh not the buttock
- Give IM **Quinine** 10 mg (0.2 ml) per kg body weight

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- If the volume to be injected exceeds 3 ml, give half into each thigh. An example of body weights and dosing (ml) for IM quinine is given in the table below.

### ***Dosage of Parenteral Quinine per body weight***

<b>Body weight</b>	<b>Quinine (ml)</b>	<b>Number of injection sites</b>
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

- Administration of pre-referral IM **Quinine** should be followed as soon as possible by definitive therapy for malaria at a hospital
- If referral is not possible within 12 hours, a second dose of IM quinine should be administered 12 hours after the initial dose
- If referral is still not possible after 24 hours, a third dose of IM **Quinine** should be given
  - 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 artesunate or quinine should be for patients unable to take oral drugs.**

- Where there is no scale, weight of the child can be estimated as follows:
  - For children of 3months to 12months old
    - ✓ **Weight (Kg) = Age (months) + 9/2**
  - For children of 1 year to 6years old
    - ✓ **Weight (Kg) = [Age (in years) x 2] + 8**

*If IM Artesunate and IM Quinine are unavailable*

- *Give Rectal Artesunate*

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#### **15.1.2.2 Additional management and supportive measures**

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- 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*



- 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 after 2-4 hours

---

### 15.1.2.3 Management of Severe Malaria Patient in Hospital Setting

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- Consider the following (8-8-8) points in the management of patients with severe malaria

**Take 8 immediate measures:**

1. Start resuscitation, particularly maintenance of a patent airway.
2. Establish IV line.
3. Make a thick blood smear for immediate malaria parasite count, (if microscopy is not available, an mRDT 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 38.5°C or above: Tepid sponge, fanning and oral or rectal paracetamol (15 mg/kg every 4 to 6 hours).
6. Control convulsions: maintain airway, treat with rectal diazepam (0.5 mg/kg) or slow IV diazepam (0.3 mg/kg, maximum 10 mg in an adult), or paraldehyde 0.1 ml/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  $\leq 3$  mmol/l or  $\leq 54$  mg/dl; give 1 ml/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 5 ml/kg/hr. If there is no test for blood glucose, treat as if the patient is hypoglycaemic.
8. **Start intravenous or intra-muscular artesunate. Dosage schedule is provided from section 2.2.2.2 below. If intravenous or intra-muscular artesunate is unavailable, use intravenous or intra-muscular quinine.**

**Look for and Deal with the Following 8 Complications:**

1. **Shock:** If cold peripheries, delayed capillary refill, or Systolic BP <50 mmHg in children 1 – 5 years or <80 mmHg in >5 years, suspect Gram-negative septicaemia. In such cases take blood samples for culture. Give parenteral broad-spectrum antimicrobials. Correct fluid disturbance, and then continue with maintenance fluid as follows:

- **for children weighing <10 kg**, give 4 ml/kg/hr.;
- **for children weighing 10 – 20 kg**, give 40 ml/hr. *plus* additional 2 ml per kg for each kg of weight in excess of 10 kg;
- **for children weighing >20 kg**, give 60 ml/hr., *plus* additional 1 ml per kg for each kg of weight in excess of 20 kg. Give oxygen if possible.

2. **Altered consciousness and/or convulsions:** Check for hypoglycaemia, 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, or 'pedalling' of legs].* If seizure suspected, treat as in item 6 in Box1.
  
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<4 g/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.*

4. **Transfuse packed red cells in most cases; in shock or severe acidosis, use whole blood. The volume transfused should be 20 ml/kg.**
  
5. **Metabolic acidosis** (deep, fast breathing): **exclude or treat** hypoglycaemia, hypovolaemia and gram negative septicaemia. Give isotonic saline 20 ml/kg of body weight rapidly or screened whole blood 10 ml/kg if PCV <18% or Hb <6 g/dl. Consider lactic acidosis and enquire whether the patient has been taking ART (**lactic acidosis is a side effect of stavudine**).
  
6. **Spontaneous bleeding or coagulopathy:** If patients have underlying malnutrition, concomitant hepatic obstruction and bile salt excretion defects or prolonged fasting for more than 3 days, transfuse screened fresh whole blood, give Vitamin K 10 mg IV slowly once a day for 3 days. For Children give 2 – 3 mg/day slow IV. Vitamin K injections should not be given to “all” severe malaria patients with spontaneous bleeding, the risks and benefit of Vitamin K administration should be considered. Serious adverse events of Vitamin K injection include hypotension, difficulties in breathing, bradycardia or anaphylaxis.

- a) **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 (furosemide IV 40 mg for adult and 0.5 – 1 mg/kg/dose for children).
- b) **Acute respiratory distress syndrome:**  
supportive treatment +/- ventilation
7. **Acute kidney injury in adults:** detect this by monitoring fluid balance. 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)
2. Vital signs every 4 hours (temperature, pulse, respiration, blood pressure)
3. Fluid balance (urine volumes, intake volumes – IV and oral – puffy eyes, chest crepitation, elevated jugular venous pressure)
4. Increasing anaemia (pallor, heart failure with increasing liver size)
5. Occurrence of convulsions – see item 2 in previous Box
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 and walk – measures of overall strength.

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#### 15.1.2.4 Management of Severe Malaria in Paediatric In-Patients

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##### *Treatment*

- Give **Artesunate** 2.4 mg/kg body weight IV (for both adults and children) on admission (at 0 hour)
  - Repeat at 12 hours and 24 hours, after initiating the first dose then once daily for not more than six days
  - Switch to **LA** once the patient can take oral treatment after at least 24 hours of **Parenteral Artesunate**
  - There should be an interval of at least 8 hours between the last dose of **Artesunate** and the first dose of **LA**

##### *Alternatively*

- Give **Artesunate** 2.4 mg/kg body weight IM into the upper-outer quarter of anterior thigh if intravenous bolus is not feasible  
**Note:** Artesunate solution should be freshly prepared prior to administration and should never be stored

*In case **Artesunate** is not available or is contraindicated, then*

- Give **Parenteral Quinine**
- *Refer to section 15.1.2.1 to determine the number of vials needed for treatment*

- For children, **Quinine** IV is administered as follows:
  - Initial (loading) dose 20 mg (**Quinine Salt**)/kg body weight: inject this dose into 10 ml/kg of 5% **Dextrose** or half strength Darrow's and infuse over 3-4 hours
  - If patient has already received **Quinine** for this illness, the first dose IV infusion should be 10 mg/kg diluted as above and given over 3-4 hours with no loading dose
  - Subsequent doses of 10 mg/kg should be given every 12 hours
  - The infusion should run for 3 – 4 hours. Continue the 5% **Dextrose** or half strength Darrow's IV fluid (10 ml/kg given over 3 – 4 hours) between doses of quinine
  - Switch to **LA** once the patient can take oral treatment after at least 24 hours of **Parenteral Quinine**  
**Note:** LA should only be taken 12 hours after last dose of quinine to avoid cardiotoxicity

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#### 15.1.2.5 Management of Severe Malaria in Adult In-Patients

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##### *Treatment*

- If the patient can be weighed, intravenous **Quinine** is administered in the same manner as for children



- If the patient cannot be weighed, IV **Quinine** should be given as follows:
  - First dose 900 mg in one litre of 5% **Dextrose** or ½-strength **Darrow's Fluids** given over 3 – 4 hours
  - Subsequent doses 600 mg in one litre 5% **Dextrose** or ½-strength **Darrow's Fluids** q12h given over 3 – 4 hours
  - Continue the same IV fluids or **Ringer's Lactate** (10 ml/kg given over 3 – 4 hours) between doses of **Quinine** (Give a maximum of about 3 litres per 24 hours to avoid fluid overload)
  - Stop intravenous **Quinine** as soon as the patient can take food and fluids orally and at least 24 hours of **Parenteral Quinine** has been administered

Note: What if 60+ kg?

- Give the appropriate dose of LA beginning 12 hours of the last dose of quinine for 3 days. For pregnant women in the first trimester give oral quinine plus clindamycin for a total of 7 days

### ***Complication that may arise in adults***

- 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

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#### **15.1.4 Treatment of Severe Malaria in Pregnancy**

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- Special attention must be paid to anaemia, hypoglycaemia and pulmonary oedema
- See below for further information on the management of complications

**Box 4: Management of complications: (see The 8-8-8 schedule above)**

Manage complication as for any adult. *Of special importance in pregnancy are:*

- Pulmonary oedema: careful fluid management, diuretics if necessary, oxygen if possible, nurse patient in semi-upright position.
- Hypoglycaemia: consider this complication if there is altered consciousness or seizure.
  - Treat as in Item 2 in Box 2.
- Anaemia: be prepared for blood transfusion, especially if the patient is close to parturition. Otherwise, indications for blood transfusion are the same as in others – (see Box 2).
- Acute kidney injury: a particular danger if there has been eclampsia or shock. Identification and management as above.
- Shock: consider concealed haemorrhage, continuing blood loss, and septicaemia. Pay special attention to fluid needs. Culture blood if possible. Administer broad spectrum antibiotics in addition to quinine.

### Treatment

- Parenteral artesunate is the recommended treatment for severe malaria in the second and third trimesters of pregnancy.
- Refer to 15.1.2.5
- Parenteral **Quinine** is the recommended treatment for severe malaria in the first trimester of pregnancy  
**Note:** Random blood glucose should be measured before and after quinine administration
- Shift to oral **Quinine** plus **Clindamycin** (during 1st trimester) and **LA** (in 2nd and 3rd trimester) as soon as the patient is able to take oral medication and at least 24 hours of parenteral therapy has been administered (refer to malaria treatment guidelines for details)

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#### 15.1.5 Malaria: Selective Chemoprophylaxis

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- The appropriate regimen for an individual depends on the circumstances.

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##### 15.1.5.1 Risk Groups

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- The following high risk groups should be given antimalarial cheprophylaxis:
  - Patients with immunosuppression caused by illness (e.g. Leukaemia, but not HIV infection or malnutrition) or splenectomy

## 15. Parasitic Diseases

- 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

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### 15.1.5.2 Antimalarial Prophylaxis Regimens

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- Give **Mefloquine** (Lariam) 250 mg weekly
  - Contraindicated in pilots, people with history of cardiac disease, neurological disease or depression, and in those taking beta-blocking drugs
- Give **Atovaquone-proguanil ('Malarone')** – one tablet daily
- Take for only one week after exposure end
  - Give **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

- Give **Proguanil** (Paludrine®) 200 mg daily
  - Should combine with an additional drug such as weekly **Chloroquine**

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### 15.1.5.3 Intermittent Presumptive Treatment of Malaria in Pregnancy (IPTp)

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- Intermittent Presumptive Treatment of malaria in pregnancy (IPTp) is one of the major malaria preventive strategies in Malawi
- Pregnant women should receive at least three doses of **Sulfadoxine-Pyrimethamine (SP)** 525mg after the first trimester
- Administer three tablets of **SP** with each scheduled antenatal care visit after quickening
- The doses should be administered at least four weeks apart and given as directly observed therapy (DOT)
- The last dose of **SP** can be delivered safely up until the time of delivery
- **Sulfadoxine-Pyrimethamine** can be given either on an empty stomach or with food

**Note:** HIV positive women receiving **Cotrimoxazole Prophylaxis** should not receive **SP**

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## 15.2 Onchocerciasis (River blindness)

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- Occurs mainly in highland areas such as Thyolo

### *Treatment*

*Adults and children > 5 kg:*

- Give **Ivermectin** 150 mcg (0.15 mg)/kg single dose

*Children < 5 years:*

- 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

**Ivermectin dose table**

Weight (kg)	Height (cm)	Age (years)	No	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 month
  - Breast-feeding mothers with babies < 1 week old
  - Children < 5 years old (i.e. < 15 kg or 90 cm height)
  - Seriously ill patients

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## 15.2 Schistosomiasis (Bilharzia)

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### *Prevention*

- 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

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### 15.3.1 Schistosomiasis Haematobium

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#### *Treatment*

- Give **Praziquantel** 40 mg/kg as a single dose
- Children below 4 years of age **Praziquantel** 20mg/kg as stat dose

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### 15.3.2 Schistosomiasis Mansonii

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- 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*

- Give **Praziquantel** 40 mg/kg as a single dose.
- Children below 4 years of age give **Praziquantel** 20mg/kg as stat dose

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#### 15.4 Trypanosomiasis (Sleeping Sickness)

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- 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

## 15. Parasitic Diseases

- 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

### 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

### 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

## 15. Parasitic Diseases

- 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 IV injection.

## 15. Parasitic Diseases

- **Melarsoprol (Mel B) dose** is 3.6 mg/kg (=0.1ml/kg). Give this as a slow IV 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 **Melarsoprol** 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 IV 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

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### 15.5 Worm Infestations

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#### 15.5.1 Ascaris, Enterobius, Ancylostoma, Trichuris Infestation

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- Ascaris limbricoides = roundworm,  
Enterobius vermicularis = pinworm,  
Ancylostoma duodenale = hookworm,  
Trichuris trichiura = whipworm
- Hookworm can contribute considerably to anaemia especially in children

## 15. Parasitic Diseases

### *Treatment*

*Adults and Children > 2 years:*

- **Albendazole** 400 mg single dose

*Children below 2 years*

- **Albendazole** 200mg

### **NOTES:**

- **Albendazole** (and **Mebendazole**) are contraindicated in pregnancy
- Heavy trichuris infections generally require treatment for 3 consecutive days
- In enterobiasis, all family members must be treated concurrently

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### **15.5.2 Strongyloides Stercoralis Infestation**

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- A hyper-infection syndrome in immunosuppressed persons can occur and may be lethal and therefore requires specialist treatment.

### *Treatment*

- Give **Ivermectin** 200mcg/kg daily for 2 days

*Alternatively*

*Adults*

- Give **Albendazole** 400 mg daily for 5 consecutive days

*Children < 2 years*

- Give **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

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### 15.5.3 *Taenia Saginata/Solium* (Tapeworm) Infestation

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*Treatment*

*Adults*

- Give **Praziquantel** 10 mg/kg stat

*Children < 2 years*

- Give **Praziquantel** 10 mg/kg stat

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## 16.0 Respiratory Conditions

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### 16.1 Acute Respiratory Infections (ARI) in Children

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- 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 Breathing** for a summary of patient assessment, classification of illness and treatment instructions

#### Note ARI Case Management

- Refer all cases for severe disease/pneumonia to hospital for admission after initial IM doses of recommended antibiotics
- Treat all pneumonia cases as out-patients with **Cotrimoxazole** or **Amoxicilin**
- Do not use cough mixtures – they have no role to play in ARI management

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### 16.1.1 Home care of children with ARI

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#### 16.1.1.1 Home care of child with ARI (2 months – 5 years)

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*Advise guardian 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



## 16. Respiratory Conditions

- 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
  - 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.

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### 16.1.1.2 Home care of child with ARI (young infant)

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*Advise guardian 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

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### 16.1.2 Common cold (nasopharyngitis)

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- 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 difficulty in breathing
- Rule out pneumonia, otitis media, and streptococcal pharyngitis
  - Advise mother on how to correctly provide suitable home care (see section 16.1)

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### 16.1.3 Sinusitis

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- 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

## 16. Respiratory Conditions

- Sinus tenderness and/or
- Facial or periobital swelling and/or
- Persistent fever
- Extract tooth under antibiotic cover  
**Benzathine Penicillin** 1.2g IM 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 tds for 7 days

*Alternatively if penicillin hypersensitivity:*

- Give **Erythromycin** 500 mg qid for 7 days

*If there is pain or fever give:*

- Analgesic/antipyretic treatment as required

---

### 16.1.4 Pharyngitis, Tonsillitis and its Complications

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- 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
- Be sure to rule out streptococcal pharyngitis to prevent acute rheumatic fever and other non-suppurative (endocarditis) and suppurative complications (retropharyngeal and peritonsillar abscesses).

## 16. Respiratory Conditions

- Signs suggestive of bacterial pharyngitis 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)

**Note:** Do not use cotrimoxazole as it is not effective

### *Treatment*

#### *Adults:*

- Give **Benzathine Penicillin** 1.2 MU single dose IM

#### *Alternatively (if assured of compliance)*

- Give **Amoxicillin** 500mg tds for 7 days

#### *Alternatively in penicillin hypersensitive patients:*

- Give **Erythromycin** 500mg qid for 7 days

#### *Children > 30 kg:*

- Give **Benzathine Penicillin** 1.2 MU single dose IM

#### *Alternatively (if assured of compliance)*

- Give **Amoxicillin 250mg** tds for 7 days

#### *Alternatively in penicillin hypersensitive patients:*

- Give **Erythromycin** 500 mg bd

#### *Children < 30 kg*

- Give **Benzathine Penicillin** 600,000 IU single dose IM

## 16. Respiratory Conditions

*Alternatively (if assured of compliance)*

- Give **Amoxycillin** 125mg-250mg tds for 7 days

*Alternatively in penicillin hypersensitive patients:*

- Give **Erythromycin** 7.5-12.5 mg/kg orally qid

**Note:** If there is pain or fever give analgesic treatment as required

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### 16.1.5 Peritonsillar and Retropharyngeal Abscesses

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- Peritonsillar abscess (quinsy) and retropharyngeal abscess

*Signs and Symptoms*

- Fever
- May cause difficulty in swallowing
- Tenderness at the angle of the jaw
- Features of upper airway obstruction such as difficulties in breathing, stridor
- Patient is unable to drink at all

*Treatment*

- **Peritonsillar Abscess**

*Adults:*

- Give **Amoxycillin** 500mg tds and
- Give **Metronidazole** 400mg tds

*Alternatively*

- Give **Benzylpenicillin** 2 MU IV q6h
- Switch when possible (usually after 48-72 hours) to oral **Amoxycillin** 500mg tds
- Continue for a total of 14 days antibiotic treatment

## 16. Respiratory Conditions

*Alternatively if penicillin hypersensitivity:*

- Give **Erythromycin** 500mg qid

*Children:*

- Give **Benzylpenicillin** 25,000 units/kg/dose
- Switch when possible (usually after 48-72 hours) to oral **Amoxycillin** 15mg/kg tds.
- Continue for a total of 14 days antibiotic treatment

*Alternatively if penicillin hypersensitivity:*

- Give **Erythromycin** 12.5 mg/kg/dose

*Further treatment*

- Give analgesic/antipyretic for pain and fever
- *Refer to hospital for the following*
  - ✓ 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
- **Retropharyngeal Abscess**

*Signs and symptoms*

  - See above
  - Surgical drainage is usually necessary, therefore should be referred.

## 16. Respiratory Conditions

### Treatment

#### Adults:

- Give **Co-amoxiclav** 625mg tds (or **Co-amoxiclav** 375mg plus **Amoxycillin** 250mg) for 14 days

#### Alternatively

- For a total of 14 days antibiotic
- Analgesic for pain and fever

#### Children:

- **Chloramphenicol** 25 mg/kg tds, initially IM or IV. later orally for a total of 14 days
- Analgesic/antipyretic for pain and fever

---

### 16.1.6 Bronchitis (Acute)

---

- Cough productive of purulent sputum, not improving after 3 days, without signs of pneumonia

### Treatment

- Give **Amoxycillin** 500mg tds for 5 days or
- Give **Doxycycline** 200mg on first day followed by 100 mg od for a further 5 days

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### 16.1.7 Cervical Adenitis

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- Adenitis may be due to bacterial infection, TB, KS and/or HIV infection among other causes

## 16. Respiratory Conditions

### Treatment

- Give **Amoxicillin** 500mg tds for 10 days

*Alternatively* if penicillin hypersensitivity:

- Give **Erythromycin** 500mg qid or
- Give **Doxycycline** 200mg on first day followed by 100 mg od for a further 9 days
- For pain or fever give analgesic

**Note:** If no improvement, do a fine needle aspiration for AFBs

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## 16.2 Lower Respiratory Tract Infections

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### 16.2.1 Asthma (Recurrent Wheezing)

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- 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



## 16. Respiratory Conditions

- 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)

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### 16.2.2 Severe Asthma

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- 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 IV line and rehydrate with **0.9% Normal Saline**
- Give High flow oxygen 5l/min

## 16. Respiratory Conditions

- Give **Salbutamol Nebuliser** solution 5 mg by nebuliser repeated initially as required, then every 6 hours *or* **Salbutamol** 4 puffs inhaled via spacer device and
- Give **Hydrocortisone** 200 mg IV 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:
  - **Amoxicillin** 500mg tds for 5 days *or* **Doxycycline** 200 mg on first day followed by 100 mg od 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 only if not already taking* **Theophylline**
- Give **Aminophylline** 250mg slowly over 10 minutes. Beware of acute **Aminophylline** toxicity including cardiac arrhythmias and seizures.

## 16. Respiratory Conditions

- *If no response:*
  - Give **Aminophylline** 250 - 500mg an IV infusion in 1L of 5% **Dextrose** or 0.9% **Sodium Chloride** over 12 hours
  - Give **Magnesium Sulphate** 1.2 – 2.0g IV over 20 minutes
  - Give **Adrenaline** 0.5-1.0ml of 1:1000 slowly nebulised or IM
  
- You may need to rescue the exhausted patient with assisted ventilation
- Reassess continuously until the patient settles

---

### 16.2.3 Milder Asthma Attacks

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#### *General measure*

- Carefully teach and monitor correct inhaler use technique and recommend a spacer device

#### *Treatment*

##### *Adults:*

- Give **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:*

- Give **Salbutamol** 2 - 4mg orally tds

**Note:** Antibiotic therapy may be indicated if signs of infection

### 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)

- Give **Salbutamol tablets** 2-4 mg 3-4 times daily.
- Give **Aminophylline** 100mg twice daily.
- Give **Prednisolone** 5 mg orally once daily.

#### *Paediatrics*

##### *Treatment for Mild Asthma*

- Use Salbutamol inhaler via spacer (and facemask if <3 years)
- Puffs 4 hourly for 2-3days

## 16. Respiratory Conditions

- Discharge with advice:
  - Inhaler and spacer technique
  - Avoid allergens
  - Return if worse

### *Treatment for Moderate Asthma*

- Use **Salbutamol** inhaler via spacer (and facemask if <3 years)
- <4yrs – 5 puffs every 20min × 3
- ≥4yrs – 10 puffs every 20mins × 3
- Give **Prednisolone**:
  - <5yrs 20mg od for 3 days
  - ≥5yrs 30mg od for 3 days
- Clinician to review child after three treatments
  - Admit if no improvement
  - look carefully for severe or life-threatening features
  - Continue 2-4hourly salbutamol via spacer.

### *Treatment for Severe or Life-Threatening Asthma*

- Give **Oxygen**
- **Salbutamol Nebuliser**
  - <4yrs 2.5mg every 20-30mins
  - ≥4yrs 5mg every 20-30mins
- Steroids:
  - Give **Prednisolone** or IV **Hydrocortisone** if not taking orally
    - ✓ <5yrs 20mg **Prednisolone** od or 50mg **Hydrocortisone** IV single dose
    - ✓ ≥5yrs 30mg **Prednisolone** od or 100mg **Hydrocortisone** IV single dose

## 16. Respiratory Conditions

- Regular reassessment and consult
- 2/3 maintenance IV fluids
- If not improving
  - Consider IV Aminophylline loading dose = 5mg/kg over 20mins then 1mg/kg/hr only with senior input
  - Consider **Chest X-Ray** to rule out **Pneumothorax** and Foreign body then consider ITU

### Aminophylline – CAUTION

- If the child has been on maintenance **Theophylline** or has been taking **Erythromycin**, the loading dose of **Aminophylline** should be omitted.
- These children will need very careful monitoring. Stop the **Aminophylline** immediately if the child vomits, has a pulse rate of > 180/min, develops a headache or has a convulsion.
- Supportive Care
  - Ensure that the child receives daily maintenance fluids appropriate for his/her age. This can be orally or IV.
  - Encourage continued breast feeding.
- On Discharge
  - Prescribe **Salbutamol via spacer** 2-4puffs 4 hourly for 2-3 days, then as required.
  - Advise completion of 3 days of **Prednisolone**
  - Teach inhaler and spacer technique
  - Avoid allergens

## 16. Respiratory Conditions

### *Chronic / Ongoing Treatment of Asthma Medication*

- All children (except mildest wheeze) need a salbutamol inhaler on discharge for when the child is acutely breathless or wheezy. 2 puffs (200mcg) up to 4 times daily.
- If >1 asthma attack consider daily **Beclomethasone**
  - years – 1 puff (100mcg ) twice a day
  - 2-12 years - 2 puffs (200mcg) twice a day
  - 12-18
  - years - 2-4puffs (200-400mcg) twice a day.

**Note:** ‘Interval symptoms’ (cough/wheeze at night or after exercise, prolonges recovery from URTIs) are guides to poorly controlled asthma.

### *Guardian Education*

- How and when to take inhalers (this will need to be observed)
- How to use a spacer
- When to seek help (eg breathlessness not controlled by inhalers, sudden increase in the need for ‘relievers’)
- Possible precipitating factors
- Follow up monthly

**Note:**

- Use for the shortest time possible before reverting to preferred Agents

## 16. Respiratory Conditions

- Where asthma is mainly a problem at night, **Salbutamol** before bed may be sufficient
- If asthma is brought on by exercise, adults can take 2 puffs of **Salbutamol** inhaler via a spacer device a few minutes before games or sports
- Exercise induced asthma is usually a sign of poor control. If possible introduce an extra level of medication according to the stepwise approach above.
- If asthma is brought on by exercise, older children and adults can take 2 puffs of **Salbutamol** inhaler via a spacer device 30-60 minutes before games or sports

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### 16.3 Community Acquired Pneumonia (CAP)

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- For all forms of pneumonia HIV testing is required.

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#### 16.3.1 Mild to Moderate Pneumonia

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- Usually caused by pneumococcus (sudden onset)

#### *Treatment*

- Give **Amoxycillin** 500mg tds for 5-7 days

#### *If Penicillin allergic*

- Give **Erythromicin** 500mg qid for 5-7 days
- Give **Doxycycline** 100mg bd for 5 – 7 days



## 16. Respiratory Conditions

**Note:** 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

#### *Treatment*

- Give **Erythromycin** 500mg qid for 5 days

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### 16.3.3 Nosocomial Pneumonias

---

- Caused by *Staphylococcus aureus*, gram negative rods and *Pneumococcus*

#### *Treatment*

- Give **Co-amoxiclav** 1.2g IV q8h or **Ceftriaxone** 2g IV q24h
- Followed by oral **Co-amoxiclav** 625mg tds for 7 days

---

### 16.3.4 Severe Pneumonia

---

#### *Signs and Symptoms*

- Respiratory rate > 30/min, shock (- BP <90/60mmHg), confusion / drowsiness central cyanosis
  - Refer to district hospital

#### *Treatment*

- Give **Ceftriaxone** 2g IV q12h

*plus*

**Azithromycin** or **Erythromycin** 500mg qid

*Alternatively*

- Give **Co-amoxiclav** 1.2g IV q8h

## 16. Respiratory Conditions

### *If aspiration*

- Add **Clindamycin** 600mg qid or **Metronidazole** 400mg tds 1.2g IV q8h

**Erythromycin** 500mg qid for 7 days

Or Give **Doxycycline** 100mg od for 7 days

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### 16.4 Suppurative Lung Disease

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#### 16.4.1 Lung Abscess

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- Give **Co-amoxiclav** 625mg tds

*plus*

**Metronidazole** 400 mg tds

*Alternatively*

- Give **Erythromycin** 500mg qid

*or*

- Give **Doxycycline** 100mg bd

**Note:** Continue treatment for 21 to 28 days

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#### 16.4.2 Empyema

---

- Carry out surgical drainage
- Continue antibiotic therapy as for CAP for 21 to 28 days
- Rule out TB

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### 16.5 Bronchiectasis

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#### *Signs and Symptoms*

- Chronic cough and sputum production years after treatment of pulmonary TB

## 16. Respiratory Conditions

### *Treatment*

- Physiotherapy to aid postural drainage of secretions every morning
- Give prompt antibiotic therapy when secondary infection occurs
- Give **Co-amoxiclav** 625mg tds

### *Alternatively*

- Give **Doxycycline** 200mg stat then **Doxycycline** 100mg od
- If sputum is foul smelling, add **Metronidazole** 400mg tds

**Note:** Treat for 14 days

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### **16.6 Chronic Lung Disease / COPD**

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- 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*

- Give **Salbutamol** as required.
- Always use a spacer device as described in the section on asthma above.
- Give **Prednisolone** 40mg od for 10 days

*If there is fever and purulent sputum then*

- Give **Amoxicillin** 500mg tds for 7 days

### **Notes:**

- 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

## *16. Respiratory Conditions*

- Long term use of oral steroids is **NOT** recommended.

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### **16.7 Pulmonary Embolism**

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- 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)

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- Refer to the Management of Sexually Transmitted Infections using Syndromic Management Approach, Guidelines for Service Providers, MoH, 3<sup>rd</sup> edition May 2008 for more detailed information.
- All patients who present with STI symptoms should be offered HIV Testing and Counselling.

**Note:** 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's visit.

## 17. Sexually Transmitted Infections (STIs)

**Note:** Periodically check the patient's understanding of the above issues by asking him/her to repeat the information given

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### 17.1 Syndromic management of STIs

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- 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)
  - Urethral discharge (UD)
  - Genito-urinary symptoms in women (GUS)
  - Lower abdominal pain (women) (LAP)
  - Acute scrotal swelling
  - Enlarged inguinal lymph nodes (bubo)
  - Balanitis/balanopostitis

---

### 17.1.1 Genital ulcer disease (GUD)

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#### *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*

- Give **Ciprofloxacin** 500mg orally stat and
- Give **Benzathine penicillin** 2.4 MU IM stat
- Give **Acyclovir 800mg** bd for 7 days
- Tell patient to return for follow-up care in 7-10 days, *see below*

**Note:** Acyclovir is indicated only in symptomatic GUD clients

*If patient allergic to penicillin/Ciprofloxacin and pregnant or lactating:*

- Give **Erythromycin** 500mg qid for 15 days plus
- Give **Acyclovir 800mg** bd for 7 days

## 17. Sexually Transmitted Infections (STIs)

*Infants born to mothers treated for GUD with Erythromycin alone:*

- Give **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



## 17. Sexually Transmitted Infections (STIs)

- 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)

---

#### *Signs and Symptoms*

- 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, proctitis or schistosomiasis

#### *Treatment*

- Give **Gentamycin** 240mg IM stat plus
- Give **Doxycycline** 100mg bd with food for 7 days
- Give **Metronidazole** 2g stat

#### *Alternative to Doxycycline in pregnancy/lactation:*

- Give **Erythromycin** 500mg qid 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

## 17. Sexually Transmitted Infections (STIs)

- 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.

## 17. Sexually Transmitted Infections (STIs)

- Treat all women with vaginal discharge and a positive risk assessment for *gonococcus* and *Chlamydia infection*, plus *trichomoniasis* and *bacterial vaginosis*.
  - 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:*
  - Give **Gentamycin** 240mg IM stat plus
  - Give **Doxycycline** 100mg bd for 7 days, *plus*
  - Give **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:*
  - Give **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:*
  - Give **Gentamycin** 240mg IM stat plus
  - Give **Doxycycline** 100mg bd for 7 days

## 17. Sexually Transmitted Infections (STIs)

- *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

**Note:** 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)

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- A serious condition which should be considered in every woman with lower abdominal pain.

**Notes:**

- Not every woman with lower abdominal pain has PID.
- Be sure to include any conditions which require immediate surgical or gynaecological treatment

*Signs and symptoms*

- Fever, lower abdominal pain, pain on discharge, vaginal discharge, cervical tenderness, and often adnexal tenderness or masses on bimanual examination.

## 17. Sexually Transmitted Infections (STIs)

### *Signs and symptoms of acute illness requiring immediate gynaecological/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
    - ✓ When referring, ensure patient's general condition is stable
- *If the patient is very ill, bleeding heavily or in shock:*
  - 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.

## 17. Sexually Transmitted Infections (STIs)

- ✓ *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 and does not have any of the signs/symptoms listed on page 404 but does have cervical excitation tenderness or fever:*
  - Give **Gentamycin** 240mg IM stat,
  - Give **Doxycycline** 100mg bd and
  - Give **Metronidazole** 400mg bd 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*

## 17. Sexually Transmitted Infections (STIs)

- *If the patient does not have missed/overdue period or abnormal vaginal bleeding and does not have any of the signs/symptoms listed on page 404, 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 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
- Pregnancy
- Metrorrhagia
- Vomiting of oral medication.

**Note:** The patient should be admitted if follow-up care cannot be guaranteed

## 17. Sexually Transmitted Infections (STIs)

### Treatment

- *If toxic:*
  - IV fluids
  - Parenteral antibiotics.
    - ✓ **Gentamycin** 1.5 mg/kg slow IV or IM q8h plus
    - ✓ **Chloramphenicol** 500mg IV q6h
    - ✓ **Metronidazole** 500mg IV q8h
- *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
  - Analgesic
- *If pain is severe:*
  - Give **Pethidine** 100 mg IM or orally
  - Repeat every 3-6 hours, as required

### Notes:

- 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 scrotal swelling/pain due to:
  - *Other long-standing causes*, e.g. Scrotal hydrocele, varicocele, inguinal hernia
  - *Recent/acute illness*, e.g. Testicular torsion or trauma, inguinal hernia

**Note:** 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:
- Give **Gentamycin** 240mg IM stat and
- Give **Doxycycline** 100mg bd for 7 days.
- In pregnant or lactating mothers **Doxycycline** should be replaced with **Erythromycin** 500mg qid 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)

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- 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

**Note:** 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*

## 17. Sexually Transmitted Infections (STIs)

- Give **Doxycycline** 100mg bd with food for 14 days

### *Alternatively in pregnancy/lactation*

- Give **Erythromycin** 500mg qid 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 syphilis 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

**Note:** 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

## 17. Sexually Transmitted Infections (STIs)

- *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 syphilis, and *molluscum contagiosum*
- Besides local caustic applications, surgical removal or electrocautery may be used for treatment:
  - For more extensive growth
  - When topical applications have failed
  - When topical applications are contra-indicated

### *Treatment*

- Apply **Compound Podophyllin Paint** to the lesions at weekly intervals
- Apply **Yellow Soft Paraffin** to avoid normal tissue damage
- 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

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### 17.3 Neonatal Conjunctivitis

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- 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

**Note:** At birth give all neonates a single prophylactic application of tetracycline eye ointment

#### *Treatment*

*Adults and all parents of infected babies:*

- **Gentamycin** 240 mg IM single dose

*Infants with signs of conjunctivitis:*

- Isolate immediately
- Institute a rigorous system of barrier nursing with careful attention to hygiene
- Give **Gentamycin** 5mg/kg IM once (7.5mg /kg if the infant is older than 7 days) and **Erythromycin** 12.5mg/kg qid for 14 days.

*Alternatively for Gentamycin,*

- Give **Cefotaxime** 50mg/kg IM as a single dose (maximum 125mg)
- Give **Tetracycline eye ointment 1%** qid for 3 days applied in each eye every 6 hours for 3 days
  - Clean away any discharge before application

## 17. Sexually Transmitted Infections (STIs)

- Wash eyes with clean water/saline ideally every 2 hours until the purulent discharge is cleared
  - *Treat Father with*
    - **Gentamycin** 240mg IM stat, and
    - **Doxycycline** 100mg bd for 7 days
  - *Treat Mother with:*
    - **Gentamycin** 240mg IM stat, and
    - **Erythromycin** 500mg qid 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 Syphilis

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- 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



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### 17.4.1 All syphilis except neurosyphilis

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*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

**Note:** Treat as late syphilis all patients with a positive RPR or VDRL and no documented syphilis serology in the last 2 years.

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#### 17.4.1.1 Early syphilis in adults

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*Treatment*

- **Benzathine Penicillin** one dose of 2.4 MU IM
  - *Divide as 1.2 MU into each buttock*

*Alternatively, if hypersensitivity to penicillin:*

- **Doxycycline** 100mg bd for 15 days

**Note:** In pregnancy/lactation, substitute **Doxycycline** with **Erythromycin** 500mg qid for 15 days

---

### 17.4.1.2 Late syphilis in adults

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#### *Treatment*

- **Benzathine Penicillin** 3 doses of 2.4 MU IM 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:*

- **Doxycycline** 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

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- Treat with a single dose of **Benzathine penicillin** 50 000 IU/kg IM 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.

## 17. Sexually Transmitted Infections (STIs)

- 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*

- Give **Benzylpenicillin** 50 000 IU/kg/dose IV q12h, 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:*
  - Give **Benzylpenicillin** 50 000 IU/kg/dose IV every 4 to 6 hours 10 to 14 days,

### *Alternatively, in penicillin allergic children*

- Give **Erythromycin syrup** 12.5mg 6 hourly for 30 days.

**Note:** The risk of penicillin hypersensitivity in the 1<sup>st</sup> month of life can be safely discounted

### 17.4.3 Neurosyphilis

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- 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:*

- Give **Benzylpenicillin** 4MU IV q6h for 14 days then
- Give **Benzathine Penicillin** 2.4 MU IM once weekly for 3 consecutive weeks

#### *Alternatively 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

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### 17.5 Trichomoniasis, vaginal

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- Coincident bacterial vaginosis reduces the effectiveness of single dose **Metronidazole** treatment
- Asymptomatic male partners should also be treated

#### *Treatment*

#### *Adults:*

- See AVD Syndrome

*Infants with symptomatic trichomoniasis or urogenital colonization persisting after the 4<sup>th</sup> month*

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

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## 18.0 Skin conditions

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### 18.1 Bacterial skin infections

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#### 18.1.1 Impetigo

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##### *Signs and Symptoms*

- Pruritus
- Crusts

##### *Investigation*

- Pus Swab

##### *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*

- Give 5% Salicylic acid with 5% Sulphur ointment

###### *Children*

- Give 2% Salicylic acid with 5% Sulphur ointment

## 18. Skin Conditions

- If extensive or involving hairy areas: Give **Flucloxacillin** 125-500mg qid for 5-7 days *or*
- Give **Erythromycin** 125-500mg qid for 5-7 days  
*If no response, refer to next level of care*

---

### 18.1.2 Folliculitis

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Bacterial infection of the mouth of the hair follicle with staphylococcus aureus

#### *Symptoms*

- Pain on affected area, pruritis

#### *Signs*

- Swelling on affected area (pustules)

#### *Investigations*

- Biopsy

---

### 18.1.3 Furunculosis and Carbuncles

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#### *Signs and Symptoms*

- *Pain*
- *Swelling of affected area*

#### *Investigation*

- Pus Swab (biopsy at central hospital level)

#### *Red Flags*

- If affected area is wide (spread out) then refer to next level of care for Incision and drainage (I & D)

## 18. Skin Conditions

### Treatment

- Clean the affected area with water and soap
- Do incision and drainage if fluctuant
- Give systemic antibiotics
  - Give **Flucloxacillin** 125-500mg qid for 5-7 days *or*
  - Give **Erythromycin** 125-500mg qid for 5-7 days

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### 18.1.4 Ecthyma

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#### *Signs and Symptoms*

- Pain on affected area
- Formation of crust and ulceration

#### *Investigations*

- Pus swab and biopsy
- 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 with warm water
- Give systemic antibiotics (**Erythromycin** or **Flucloxacillin** and alternative treatment is **Amoxicillin**) for 14 – 28 days

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### 18.1.5 Neonatal Pustulosis/ Bullae

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#### *Signs and Symptoms*

- Pain on affected area, pruritis
- Pustules on affected area

#### *Investigations*

- Check Venereal Disease Research Laboratory (VDRL) status

#### *Causes*

- Staphylococcal aureus or Streptococcal pyogenes, syphilis (*Treponema pallidum*)

#### *Treatment*

- Give **Potassium permanganate** baths twice a day for two weeks
- Give **Benzylpenicillin** 50,000 units/kg IM or IV q12h for 5 days *plus* **Gentamycin** 2.5mg/kg IM or IV q12h for 5 days
- Check the mother's VDRL or TPHA – if positive, then treat

#### *Red Flag*

- If neonate shows signs of severe illness (e.g. not feeding)



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### 18.1.6 Erysipelas

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#### *Signs and Symptoms*

- Pain on affected area
- Well demarcated (defined), erythematous superficial skin lesion with some blisters

#### *Causes*

- Commonly caused by a beta- haemolytic group-A streptococci

#### *Investigations*

- Biopsy performed at central hospital level

#### *Treatment*

- Give **Benzyl Penicillin** 2MU IM q6h
- When temperature drops or when condition improves change to **Erythromycin** 500mg qid for 5-7days
- Apply **GV paint** bd

---

### 18.1.7 Cellulitis

---

#### *Signs and Symptoms*

- Pain on affected areas
- Poorly defined erythematous lesion
- This is bacterial infection of the deeper part of the dermis and the upper part of the subcutaneous tissue

#### *Investigations*

- Biopsy performed at central hospital level

#### *Treatment*

- Give **Flucloxacillin** 125 -500mg qid for 7 – 10 days

#### *If penicillin hypersensitive*

- Give **Erythromycin** 500mg qid for 7 -10 days

## 18. Skin Conditions

*If the patient is systemically unwell*

- Give **Benzyl Penicillin** 2 MU IM qid for 7 – 10 days or oral antibiotics
- Elevate the leg(s) on a pillow to reduce swelling

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### 18.1.8 Staphylococcal Scalding Skin Syndrome – Lyell's disease

---

*Signs and Symptoms*

- Pain on affected area
- 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

*Investigations*

- Biopsy performed at central hospital level

*General Supportive Measures*

- Replace fluid
- Give **Flucloxacillin** or **Cloxacillin** 250 – 500 mg qid for 7days

**Note:** Cortico-steroids are contraindicated

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## 18.2 Erythema Multiforme/Steven Johnson's Syndrome

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### 18.2.1 Erythema multiforme – Minor (Iris Type)

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#### *Signs and Symptoms*

- Usually asymptomatic
- 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 erythematous type outer border

#### *Treatment (Symptomatic)*

- Give **Potassium Permanganate** baths bd
- Apply **Calamine lotion** if vesicular origin or popular eruptions
- Identify the cause and treat. If the cause is medicine, stop the medicine
- Give **Chlorpheniramine 4mg** tds for 7 days

---

### 18.2.2 Steven Johnson's Syndrome/Vesicobullous type

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- Potentially fatal condition (to be managed at central hospital level)
- Often caused by hypersensitivity to medication
- Always ask for use of antiretroviral therapy (nevirapine), sulphur drugs, and penicillines. These need to be stopped immediately

## 18. Skin Conditions

### *Signs and Symptoms*

- Pain and burning sensation on affected area
- Peeling skin and ulceration of mucous membrane

### *Treatment (Symptomatic)*

- Give **Normal Saline**
- Add **Dextrose 50%**
- Identify the cause and treat. If the cause is medicine, stop the medicine
- Keep patient warm
- Give **Potassium Permanganate** baths bd
- Apply **GV Paint** bd on fresh lesions
- Give **Acyclovir 800mg tds for 5 days** in adults if of viral origin
- Give **Ceftriaxone 2g IV q24h for 5 days**
- High protein diet is recommended

---

### **18.3 Toxic Epidermal Necrolysis (TEN)**

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- Often caused by hypersensitivity to medication but unlike in Steven Johnsons Syndrome, the mucous membrane is not affected
- Always ask for use of antiretroviral therapy (nevirapine), sulphur drugs, and penicillines. These need to be stopped
- Refer to the hospital

## 18. Skin Conditions

### Treatment

- Give **Prednisolone (step-wise treatment)**  
80mg od for 1 week; 70mg od for 3 days;  
60mg od for 3 days; 50mg od for 3 days;  
40mg od for days; 30mg od for days; 20mg  
od for days; 10mg od for days; 5mg od for 3  
days
- Give **Normal Saline**
- Identify the cause and treat
  - Give **Ceftriaxone** 2g IV once daily for 5  
days
  - High protein diet is recommended

---

### 18.4 Fixed Medicine Eruption

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- Diagnosis is clinical and in relation to history
- Stop the offending medicine

### Signs and Symptoms

- Itching and/or pain on affected area
- Erythematous skin, blistering and  
hyperpigmentation on affected area

### Treatment

- Use potent topical steroids e.g.  
**Betamethasone 0.05% cream bd**

### If severe:

- Give **Chlorpheniramine** 4-8mg bd for 7 -14  
days

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### 18.5 Urticaria

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It is called angioedema if deep dermis and  
subcutaneous tissues are involved

## 18. Skin Conditions

### *Signs and Symptoms*

- Extreme pruritus
- Wheals on affected area

### *Red Flags*

- If it is angioedema, refer

### *General Management*

- Explain the condition to the patient
- Remove the cause if known

### *Treatment*

- Give antihistamines
  - Give **Promethazine** 25mg IM 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. Anthistamines can be given for 1-3 months

### *Alternatively*

- Give **Chlorpheniramine** 4-8mg at night or every 8 hours for 1-2 weeks (maximum of 3 months)
- Give **Cetirizine** 5-10mg od (if severe) for maximum of 3 months
- Give **Albendazole** 400mg stat
- Apply **Calamine lotion** at night or twice daily
- Give **Adrenaline** 0.5mg stat dose sub-cutaneously in severe urticarial with tracheal angioedema

## 18.6 Eczema (dermatitis)

---

### *Signs and Symptoms*

- An inflammatory itchy skin condition
- Erythematous skin, oozing, vesicles, bullae, crusts, lichenification

### *Treatment*

- Determine the type of eczema
- Types: Atopic (*seborrhoeic [indogenous]*), Allergic (*irritant contact eczema [exogenous]*)
- Eczemas are often secondarily infected (impetigo), systemic antibiotic treatment should be added if indicated
- *In HIV (+) children, extensive seborrhoeic dermatitis may occur*
  - Give **Potassium Permanganate** baths bd
  - And topical steroids e.g. Give **Hydrocortisone 1%** cream or ointment *or* **Sulphur 5% with emulsifying ointment** bd
  - If no response, give second line topical steroids or group 3 e.g. **Betamethasone 0.05% creams**
- *If secondary bacterial infection occurs:*
  - Treat with systemic antibiotics: Give **Flucloxacillin** or **Erythromycin 500mg** qid for 5-7 days in adults

## 18. Skin Conditions

### 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:

- Give **Promethazine** 25 mg orally at night for 7 days

#### Children:

- Give **Promethazine** 1 mg/kg at night for 7 days

#### Alternatively

- Give **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 then be treated with Betamethasone cream/ointment or Crude coal tar 5 % ointment.

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### 18.6.1 Acute eczema

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- Sudden eruption with erythema, vesicles and sometimes bullae, often with serous exudates (wet appearance)



## 18. Skin Conditions

### *General Management*

- Wet or oozing lesions - dry them first with **Calamine lotion** 2 times a day
- Give **Chlorpheniramine** 4mg at night for 7 days

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### **18.6.2 Subacute eczema**

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- Lesions take several days to erupt, are red but not wet or may be slightly wet. Few vesicles.

### *General Management*

- Normal or slightly wet lesions- use **Hydrocortisone 1% cream** twice a day
- Give **Chlorpheniramine** 4mg at night for 7 days

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### **18.6.3 Chronic eczema**

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- Develops after months/years, thickened dry and scaly skin, (lichenification), deep cracks (can bleed) scratch marks, sometimes infected

### *General Management*

- Dry skin lesions
  - Apply **Hydrocortisone ointment 1%** bd

### *Alternative*

- Give potent steroid e.g. **Betamethasone 0.1%**

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## 18.7 Fungal skin infections

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### 18.7.1 Tinea

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- *Types:* Capitis, corporis, pedis, cruris, unguium.
- Instruct patients on the importance of treatment compliance in order to eradicate the infection

#### *Signs and Symptoms*

- Pruritus
- Well-defined lesions and hair loss in tinea capitis
- In tinea corporis and cruris, there are well-defined lesions and scales
- Scaling and ulceration occur inter-digitally in tinea pedis

#### *Treatment*

- *For wet lesions*
  - Dry by soaking or mopping with **Potassium Permanganate bd for 2 weeks**

#### *Alternatives*

- Apply **Calamine Lotion** *or* **Gentian violet Paint**
  - Then, apply **Compound Benzoic Acid Ointment 6% and Salicylic Acid 3%** *or* **Clotrimazole Cream 1%**
  - *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

## 18. Skin Conditions

### 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*

- Give **Ketoconazole** or **Fluconazole**

### *Red Flag*

- Ketoconazole may cause liver toxicity when used for prolonged periods
- In HIV (+) patients all Tineas may be extensive

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## 18.8 Viral skin infections

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### 18.8.1 Herpes simplex

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*Types: Type 1 (affects lips), Type 2 (affects genitals but can interchange due to oral sex)*

### *Signs and Symptoms*

- Pain and pruritus on affected area
- Grouped vesicles on affected area

### *Treatment*

- In case of bacterial superinfection
- Use salt mouth wash or **Chlorhexidine Solution** bd for 7 days
- Give **Acyclovir Cream** or **GV Paint** or **Silver Sulphadiazine Cream Application** bd for 1-2weeks

## 18. Skin Conditions

- Give **Aspirin** 600mg tds or **Paracetamol 1g tds for 3 days** (*avoid Aspirin in children as it may cause Reye's syndrome*)
- In severe conditions give **Acyclovir** 200-400mg tds for 5 to 7 days and consider testing for HIV

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### 18.8.2 Varicella (Chicken pox)

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*Refer to Section 9.8*

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### 18.8.3 Herpes zoster (shingles)

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- *Causes:* varicella zoster virus
- A common presentation in HIV(+) patients

#### *Sign and Symptoms*

- Painful lesions
- Grouped vesicles, then development of blisters may occur

#### *Treatment*

- Give **Acyclovir** 800mg 5 times a day for 5-7 days; best within 24 -72hours from onset of the lesions
- Apply **Calamine lotion** or **Acyclovir cream** bd on intact lesions until they break or **GV paint** or **topical antibiotic** cream bd
- Give analgesics for pain relief
- *For ophthalmic herpes zoster* treat as above and refer to eye department
- Refer for HIV Testing

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## 18.9 Prurigo/Pruritus

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### Sign and Symptoms

- Itching

### Causes

- Iron deficiency, anaemia, lymphoma, leukaemia

### Treatment

- Adults and Children (symptomatic treatment):
- Apply **Calamine Lotion** 2-3 times daily
- Give **Promethazine** 25mg single dose at night

or

- Give **Chlorpheniramine** 4-8mg at night for 2 weeks
  - Children: 1 mg/kg/ dose
- Give Emollients like **Emulsifying plain ointment** applications or baths twice a day may help reduce itching
- Investigate the cause, and treat accordingly

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## 18.10 Scabies

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### Signs and Symptoms

- Pruritus
- Burrows and papules on affected area
- Secondary infection is common and may mask the condition.
- Treat the whole family and any other close contacts

## 18. Skin Conditions

### 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*

- Apply **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*
  - Apply **5% Salicylic acid and sulphur** ointment bd

## 18. Skin Conditions

- ✓ Consider checking HIV status

*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

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### 18.11 Tropical ulcer

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*Signs and Symptoms*

- Painful ulcers

*General Management*

- Improve nutrition and diet

*Treatment*

- Clean ulcer with **Hydrogen peroxide solution bd for two weeks**

*Alternatively*

- Apply **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

## 18. Skin Conditions

*If local infection presents:*

- Give **Amoxicillin** 500mg every qid for 7 days *or*
- **Erythromycin 500mg** qid 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

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### **18.12 Onchocerciasis**

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*Refer to Section 15.2*

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### **18.13 Buruli Ulcer**

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*Sign and Symptoms*

- Painless ulcers
- Papules, nodules, plaques, ulcers
- This is an ulcerative skin condition caused by *Mycobacterium ulcerans*

*Treatment*

- Depends on stage of condition, but if ulcerated
  - Daily wound dressing with **Normal Saline 0.9%**
  - Medicine therapy doesn't usually work
  - Surgery

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### **18.14 Leprosy**

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*Refer to Section 9.2*



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## 19.0 Vaccinations

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- For tetanus toxoid vaccination (TTV) see *Section 12.3*

### Vaccination schedule for children

At birth: **BCG** 0.05ml 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  
**ROTA 1**: 1ml oral  
**PCV 1**: 0.5ml IM

10 weeks: **PENTAVALENT 2** : 0.5 ml IM  
**Polio 2** : 2 drops orally  
**ROTA 2**: 1ml oral  
**PCV 2**: 0.5ml IM

14 weeks: **PENTAVALENT 3** : 0.5 ml IM  
**Polio 3** : 2 drops orally  
**PCV 3**: 0.5ml IM

6 months: Oral Vitamin A

9 months: **MEASLES**: 0.5 ml deep S/C

12 months: Oral Vitamin A

**PENTAVALENT = DPT, Hepatitis B and Haemophilus influenza type B**

**PCV = Pneumococcal Conjugate Vaccine**

**Notes:**

- Aim to complete this schedule within the first year of life
- **BCG vaccination:** give this as early as possible in life, preferably at birth – complications are uncommon. BCG is contraindicated in symptomatic HIV infection
- **Measles vaccination:** normally give this when a full 9 months of age is reached
- 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
- **Pentavalent/polio/ROTA/PCV:** the minimum interval between doses is 4 weeks
- **Tetanus toxoid** vaccination: give a full course of this:
  - To all women *see Section 12.3*
  - After administration of anti-tetanus serum (ATS) to any previously unimmunised patient
  - If over 10 years has elapsed since the last booster dose

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## 20.0 Bites, Burns and Wounds

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### 20.1 Animal Bites

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- 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 on Section 20.1.2)
- 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 on Section 20.1.2* 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*
- 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 *Section 20.1.2*
- Give **Co-amoxiclav 625mg tds** plus **Metronidazole 400mg tds**
- 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

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### 20.1.1 Post- exposure immunization

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- Give anti-rabies vaccines to all patients unvaccinated against rabies, together with local wound treatment, and in severe cases, rabies immunoglobulin (*see recommendation in Section 20.1.2*)

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### 20.1.2 Administration of anti-rabies vaccine

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- Use intra-dermal injection regimes for Anti Rabies Vaccine 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 IM on days 0, 3, 7, 14 and 28

#### *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

### 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
		Rabid	Vaccinate
3. Saliva in contact with mucosae, serious bites (face, head, fingers, or multiple bites)	Domestic or wild rabid animal or suspect		Vaccinate, and give antirabies serum
		Healthy domestic animal	Vaccinate, but stop course if animal healthy after 10 days

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### 20.1.3 Post-exposure immunization in previously vaccinated patients

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- 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** IM as above
- If completely vaccinated more than 3 years before or if incompletely vaccinated, give a complete post-exposure vaccination course

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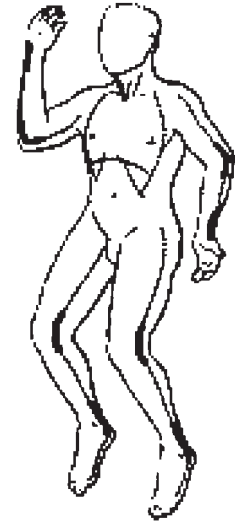
## 20.2 Burns

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- Remember the ABCs of life support
  - If evidence of inhalation, such as singed nasal hairs, soot in nose, refer to tertiary hospital
  - Pain relief (refer to Palliative Care section)
- Assess the severity of the burn (see table in section 20.2.1)
- 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

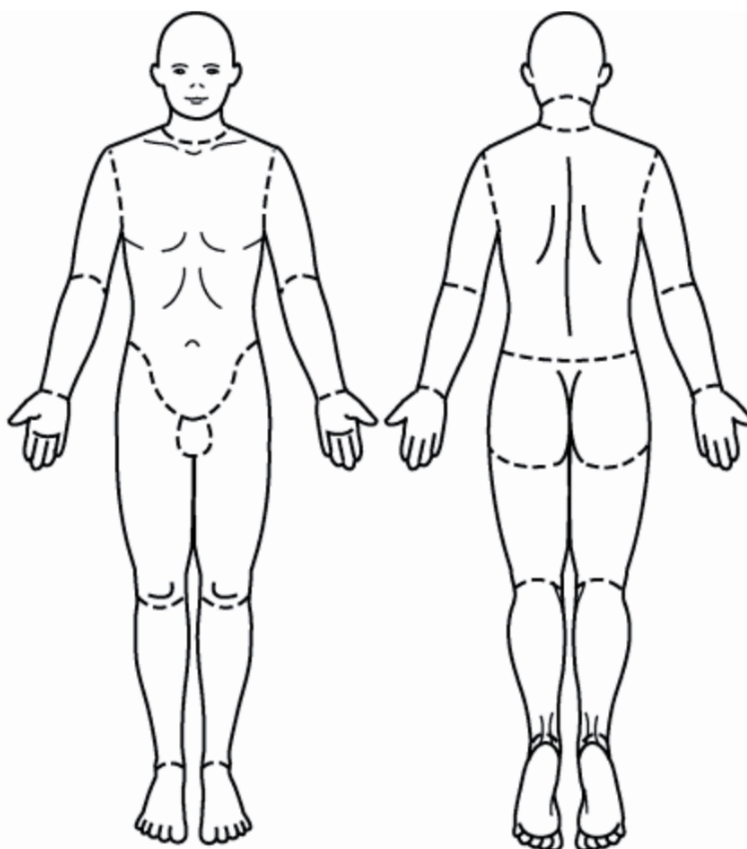
## 20. Bites, Burns and Wounds

- 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*)
  - Do a blood culture and malarial parasites
  - Start intravenous flucloxacillin





### 20.2.1 Calculation of Body Surface Area Affected



	Birth 1 yr.	1-4 yrs.	5-9 yrs.	10-14 yrs.	15 yrs.	Adult	Burn size estimate
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	2.5	2.5	2.5	2.5	2.5	2.5	
Left buttock	2.5	2.5	2.5	2.5	2.5	2.5	
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	2.5	2.5	2.5	2.5	2.5	2.5	
Left hand	2.5	2.5	2.5	2.5	2.5	2.5	
Right thigh	5.5	6.5	8	8.5	9	9.5	
Left thigh	5.5	6.5	8	8.5	9	9.5	
Right leg	5	5	5.5	6	6.5	7	
Left leg	5	5	5.5	6	6.5	7	
Right foot	3.5	3.5	3.5	3.5	3.5	3.5	
Left foot	3.5	3.5	3.5	3.5	3.5	3.5	

Total BSAB \_\_\_\_\_

*Adults and Children:*

- Give IV 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 IV 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 IV fluid replacement

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- The object is to maintain normal physiology as reflected by urine, vital signs and mental status
- Use **Ringer's Lactate** IV infusion or (if this is not available) **Normal Saline**
- A general formula and dosage schedule that may be used for the first 24 hours is:
  - Total volume of IV infusion required (before above additions) = 4 ml/kg x % BSA burned plus normal daily requirement

## 20. Bites, Burns and Wounds

- 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*)
  - 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*) *If patient is developing signs of tetanus*
  - Give **Tetanus Antitoxin (ATS)** 1,500 units s/c or IM
- *Once the lesion is clean/clear of necrotic tissue:*
  - Refer for skin grafting, if necessary, otherwise
  - Dress the burn with **Paraffin Gauze Dressing**

## 20. Bites, Burns and Wounds

- 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% bd**
  - 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

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### 20.3 Open wound

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*General Management*

- Clean fresh wounds with **Cetrimide 15% + Chlorhexidine Solution 1.5%** diluted 1 in 20 parts water
- Appropriately suture fresh wound (i.e. < 6 hours old)
- Do not suture penetrating wound
- Refer to the next level of care

**Note:**

- Any skin damage overlying a fracture makes it an open fracture
- It is important to ascertain the cause of the wound

*Alternatively*

- Clean with **Hydrogen Peroxide Solution** (10 vol)
- For local infiltration or as a peripheral nerve block use **Lignocaine Hydrochloride** injection 1% maximum dose: adults 4mg/ kg body weight; children 4mg/kg
  - Or use **Lignocaine 1%** (10mg per 1ml) + **adrenaline 1:200,000** injection
    - ✓ Maximum dose: adults 7mg/kg, children 7mg/kg

**Note:** Do not use anaesthetics containing adrenaline for anaesthesia in digits or appendages due to risk of ischaemic necrosis

- Always remember to give **Tetanus Toxoid Vaccination** (*Section 12.3*)
- If patient has signs of tetanus give **Tetanus Antitoxin Serum** (ATS) 1,500 IU s/c or IM
- If wound is grossly contaminated give **Tetanus Antitoxin Serum** 3,000 IU s/c or IM (alongside copious washing)

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## 20.4 Insect stings and bites

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### 20.4.1 Envenomation by insects

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- Bees, wasps: Usually benign, but may provoke either laryngeal oedema or anaphylactic shock (*see Section 5.1.1*)
- 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 below*)

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### 20.4.2 Snake bite

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- Venom diffuses mainly via the lymphatics, not via blood vessels, tourniquets are thus of little use

#### ***First Aid Treatment***

- Clean the wound with **Cetrimide + Chlorhexidine solution 15% + 5% diluted 1 in 20**

#### ***Alternatively***

- Clean with **Hydrogen Peroxide Solution (10 vol)**
- Apply firm constant pressure to the site of the bite
- Apply a crepe bandage firmly to the entire limb
- Immobilize the patient for 12 hours observation
- Give reassurance

**Note:** Not all patients with snake-bite should be given **Anti-venom**

**Administration of Snake Anti-venom**

- Ensure that the **Anti-Venom Solution** is clear
- Give 0.5 ml of **Adrenaline 1/1000** subcutaneously 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

### **Supportive Therapy**

- Give reassurance – most snake bites are not dangerous
- Treat shock if any (*see Section 5.1.1*)
- Give an antihistamine:

#### **Adults:**

- Give **Promethazine** 25 mg/day up to 75 mg/day in equal doses

#### **Children > 6 months:**

- Give **Promethazine** 1 mg/kg/day given in divided doses every 12 hours
- Give **Tetanus Toxoid Vaccination** (*Section 12.3*)  
*If patient is developing signs of tetanus:*
- Give **Tetanus Antitoxin (ATS)** 1,500 IU s/c or IM
- Give **Benzyl penicillin** 2.4 MU once daily for 5 days
  - 25,000 units/kg daily
- Eventually excise sloughs and graft skin early

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## **20.5 Superficial injury, bruise, minor cut**

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### **General management**

- Clean the wound with **Cetrimide 15% + Chlorhexidine Solution 1.5%** diluted 1 in 20 parts water



*Alternatively*

- Use **Hydrogen Peroxide Solution (10 vol)**

*If the patient is unimmunised or not fully immunized and the wound is grossly contaminated:*

➤ **Give Tetanus Toxoid Vaccination**

*(Section 12.3) If the wound is dirty:*

- ✓ Adults: Give **Benzympenicillin** 2.4 MU IM stat
- ✓ Children: Give **Benzympenicillin** 25,000 units/kg

*Then*

- ✓ Adults: Give Amoxicillin 500mg every 8 hours for 5 days
- ✓ Children: Give Amoxicillin 15mg/kg

*If Penicillin hypersensitivity:*

- ✓ Give **Erythromycin** 250 mg every 6 hours for 5 days

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## 21.0 Renal Conditions

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- Starts with upper complicated then acute lower urinary tract conditions

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## 21.1 Cystitis/Urethritis

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### *Signs and Symptoms*

- Pain when passing urine
- Fever
- Blood in urine

**Note:** Think of Bilharzia; Diabetes Mellitus and cancer of the urinary bladder also in patient with similar presentation and symptoms are recurrent

### *Treatment*

- Ensure adequate fluid intake
- For acute uncomplicated (all non-pregnant women, symptoms duration less than 1 week, not men or catheterized patients) give **Ciprofloxacin** 500mg bd for 5 days

### *Alternatively*

- Give **Nitrofurantoin** 100mg qid with food for 7 days
- Consider urine microscopy, culture and sensitivity if no response or recurrent infections to guide treatment

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## 21.2 Complicated Urinary Tract Infections

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- Includes men, pregnant women, catheterized patients, patients with abnormal urinary tracts and those with symptoms > 1 week

### *Treatment*

- Give **Ciprofloxacin 500mg** orally bd for 5 days  
*or*
- Give **Co-amoxiclav** 375mg tds or 625mg bd for 5 days

### *Alternatively*

- Give **Gentamycin** 240mg IM or IV stat
- Followed by any of the above oral antibiotics
- Consider urine microscopy, culture and sensitivity to guide treatment if no response to above treatment or recurrent infections

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## 21.3 Upper Urinary Tract Infections

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### 21.3.1 Pyelonephritis

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#### *Sign and Symptoms*

- Significant fever, rigors, vomiting, flank pain

#### *Treatment*

- Give **Ciprofloxacin 500mg** orally bd for 10-14 days *or*
- Give **Co-amoxiclav** 375 mg tds for 10-14 days
- IV fluids if clinically indicated

*Alternatively*

- Give **Gentamycin** 240mg IM or IV stat
- Followed by any of the above oral antibiotics for 10-14 days
- Refer patients with recurrent UTI for further investigations

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## **21.4 Urinary Tract Infections (UTIs) in Children**

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*Sign and Symptoms*

- In young children, UTI often presents with non-specific signs, on examination, such as vomiting, fever, irritability, or failure to thrive
- Older children may present with more specific signs such as abdominal pain, pain on passing urine or increased frequency of passing urine

*Investigations*

- Try to get a clean catch sample of urine
- In sick infants, suprapubic aspiration of urine may be required
- Dipstick the urine looking for leukocytes and nitrites
- Do microscopy if positive dipsticks result and consider UTI if more than 5 white cells per high power field

## 21. Renal Conditions

### Treatment

<3 months	Admit the child and treat with: <b>Gentamicin</b> and <b>Benzylpenicillin</b> , <b>Ceftriaxone</b> as second line; consider Blood Culture and Lumbar Puncture
>3 months or older child with signs of systemic illness (T>38C, rigors, renal angle tenderness)	Admit and treat with <b>Gentamicin</b> and <b>Benzylpenicillin</b> or <b>Ceftriaxone</b>  Change to oral antibiotic when fever settled and improving to complete 10 days treatment
>3 months or older child with no signs of systemic illness	Treat with oral antibiotics <b>Cotrimoxazole</b> 10mg/kg bd or <b>Amoxicillin</b> , <b>Ciprofloxacin</b> , <b>Nitrofurantoin</b> 1.5mg/kg qid

- Refer to hospital for further investigations and follow up in the following:
  - Atypical UTI:
    - ✓ Seriously ill
    - ✓ Poor urine flow
    - ✓ Abdominal or bladder mass
    - ✓ Raised creatinine if measured
    - ✓ Septicaemia
    - ✓ Failure to respond to treatment with suitable antibiotics within 48 hours

## 21. Renal Conditions

- Recurrent UTIs:
  - ✓ 2 or more episodes of UTI with acute pyelonephritis/upper urinary tract infection
  - ✓ One episode of UTI with acute pyelonephritis/upper urinary tract infection plus one more episode of UTI with cystitis/lower urinary tract infection
  - ✓ Three or more episodes of UTI with cystitis/lower urinary tract infections
- All males > 1 year of age with UTI
  - They should all have a renal tract ultrasound scan to look for structural abnormalities
  - Children with abnormalities should be followed up in clinic at the hospital

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### 21.5 Acute Nephrotic Syndrome

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- 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

**Note:** Renal diseases can easily be mistaken for malnutrition

## 21. Renal Conditions

### General Treatment

- Monitor BP, urine output, weight
- Urine dipstick and microscope
- Avoid added salt
- Treatment is usually supportive

### Adults:

- Give **Phenoxymethylpenicillin** 500 mg every qid for 7 days

### If oedematous:

- Give **Frusemide** 40-80 mg od

### If hypertension is present:

- Treat accordingly (*Section 2.3*)

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## 21.6 Nephrotic syndrome

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### Diagnosis

- Proteinuria
- Hypo-albuminaemia
- Oedema
- High cholesterol
- Investigate a possible cause
  - Blood pressure
  - Urinalysis
  - Urine microscopy (look for casts and check for schistosoma ova)
  - MPs and PCV
  - Electrolytes
  - Urea and Creatinine
  - Imaging on individual basis: renal USS, CXR, cardiac echo

## 21. Renal Conditions

### *General Management*

- Adequate protein intake
- Restrict salt intake
- Monitor fluid intake and output
- Daily weight measurements

### *Treatment*

#### *Adults*

- Give **Frusemide** 40-80 mg as a single dose each morning
- Give **Enalapril** 10-20 mg od (use with caution, stop if renal function deteriorates)
- A trial of steroids is indicated (responsiveness to steroids in adults is less than in children). Give **Prednisolone** 50-60 mg od for up to two months, tapering off is required after response

#### *If Schistosomiasis is diagnosed or suspected as cause*

- Give **Praziquantel** 40 mg/kg single dose

#### *Children*

- Give **Prednisolone** 2mg/kg/day or 60mg/m<sup>2</sup>/day for at least 4 weeks then a reducing regimen
- Should be reviewed at hospital clinics before reducing dose
- Only use steroids if picture consistent with minimal change disease (heavy proteinuria, NORMAL BP, NO haematuria)



## 21. Renal Conditions

- Consider **Frusemide** 1-4mg/kg/day oral or IV when hypertensive. Review use of diuretics on a daily basis
- **Prophylactic Penicillin** or **Amoxicillin** oral to prevent infections.
- Encourage mobilization as normal

*If presentation is acute:*

- Give **Phenoxymethyl Penicillin** 500 mg qid for 7 days
- Refer to Nephrologist

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### 21.7 Renal Colic

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#### *Treatment*

- Intravenous fluids
- Give **Morphine** or **Pethidine**. (Section 24.9)
- Give **Hyoscine butylbromide** 20 mg deep IM stat
- Repeat after 30 minutes if necessary
- Ensure fluid intake of 3-4 litres/day after the crisis
- Intravenous Pyelography is usually indicated

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### 21.8 Renal Failure (acute)

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- 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

#### *Signs and Symptoms*

- Oliguria
- Oedema

## 21. Renal Conditions

- Vomiting
- Look for clues for the cause of renal failure, which include:
  - Shock
  - Acute glomerulonephritis
  - Use of herbal remedies containing nephrotoxins

### *General Management*

- Assess the hydration status of the patient
- Patients who are dehydrated will need fluid resuscitation
- Avoid **Ringer's Lactate** fluids
- 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 fizzy drinks
    - ✓ If potassium is  $> 6.5\text{mmol/l}$  give **Insulin** 10 Units in 50ml of 50% **Dextrose** infusion over 30 minutes
    - ✓ Give a **Potassium Binding Resin** 30-60g orally

## 21. Renal Conditions

- Refer patient to Central Hospital for further management and consideration for dialysis if not responding to measures above

### *Indications for dialysis include:*

- Hyperkalaemia refractory to insulin shifting
- Fluid overload not responsive to diuresis
- Metabolic acidosis
- Pericarditis
- Uremic symptoms and signs (encephalopathy, haemorrhagic pericardial effusion bleeding)
- Lithium and theophylline overdose

### **Note:**

- Treat complications of renal failure such as convulsions, hypertension
- Do an HIV and Hepatitis B test before referral for dialysis

---

### **21.8.1 Use of medicines in renal failure/impairment**

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**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

## 21. Renal Conditions

### *Use with care in reduced doses:*

- Amoxicillin
- 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

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## 22.0 Poisoning

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### 22.1 General principles of treatment

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- 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

**Note:** In all cases of poisoning in children, the social workers must be involved to assess the social circumstances and take the necessary steps to ensure the child is not at risk of further incidences

#### *General Management*

- Conserve body heat (if necessary)
- Maintain respiration
- Clear the airway
- Breathing-Maintain ventilation – use artificial respiration if necessary, patient may need ventilation

## 22. Poisoning

- Maintain BP/treat shock
  - Correct hypotension
  - Elevate the legs
  - Correct hypertension
  - In refractory shock discuss with anaesthetist
- Maintain fluid balance
- Monitor fluid intake and output

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### 22.2 Swallowed poisons

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#### *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 substance is not known

- Treat any complications as necessary
  - E.g. hypothermia, hypoglycaemia, convulsions, electrolyte or acid/base disturbances

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### 22.2.1 Methods of emptying the stomach

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- **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
- **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

## 22. Poisoning

- Aspirate with the patient in the head down position, taking special note of the airway
- Repeat lavage until aspirated fluid is clear

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### 22.2.2 Use of activated charcoal

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- 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



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### 22.2.2.1 Administration of activated charcoal

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- 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

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### 22.3 Paraffin, petrol and other petroleum products

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- 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 anaesthesia
- Treat any pulmonary oedema and pneumonia as required
- Giving unabsorbable oral liquid, e.g medicinal liquid paraffin

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## 22.4 Iron poisoning

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### *Treatment*

- 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:*

- Give **Desferrioxamine** 5-10g orally or by nasogastric tube in 50-100 ml of **Sodium Bicarbonate** solution 5%

### *In serious cases:*

- Give **Desferrioxamine** 15 mg/kg/hour by IV 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

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- Gastric emptying 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*)

## 22. Poisoning

- 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) or **Ringers Lactate** may be needed to increase renal excretion

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### 22.6 Organophosphate or Carbamate Poisoning

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- 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

#### *General 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 IV or IM (children: 0.05 mg/kg)

## 22. Poisoning

- 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 IV (over 15-30 minutes) as a 5% solution in water for injections
- If IV not possible: give IM or s/c and repeat once or twice at 4-6 hour intervals if needed
  - If possible: monitor treatment by determination of blood-cholinesterase concentrations

**Note:** Do not give **Pralidoxime** (or other oximes) in carbamate poisoning

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### 22.7 Paracetamol poisoning

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- 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

## 22. Poisoning

- 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 IV 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*)
- Restart the infusion

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## 23.0 Nutritional disorders

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### 23.1 Malnutrition

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#### 23.1.1 Definition Severe Malnutrition

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- Children 6-59 months
  - $< -3Z$  score of expected weight for height
  - $< 11.5$ cm MUAC
- Children 5-9 years
  - MUAC  $< 13.0$ cm
- Children 10-12 years
  - MUAC  $< 16.0$ cm
  - $< -3Z$  score WFH
  - Oedema +1 or +2
- Children 12–14 years
  - Bilateral pitting oedema (to be assessed by a clinician for medical causes)
  - Weight for Height (WHZ)  $< -3$
  - Mid-Upper Arm Circumference (MUAC)  $< 16.0$  cm
- Children 15-18 years
  - Bilateral pitting oedema ( to be assessed by a clinician for medical causes)
  - MUAC  $< 18.5$  cm
  - Body-Mass Index (BMI)  $< 16$

## 23. Nutritional Disorders

- Adults (non-pregnant/ post-partum)
  - Bilateral pitting oedema (to be assessed by a clinician for medical causes)
  - MUAC < 18.5 cm
  - BMI < 16
- Pregnant/ post-partum women
  - MUAC < 19.0 cm

---

### 23.1.2 Definition Moderate Malnutrition

---

- Children 6-59 months
  - -3Z to <-2Z score of expected weight for Height
  - MUAC 11.5 to 12.5cm
- Children 5-12 years
  - BMI for age -3 to <-2Z score
- Children 12–14 years
  - WHZ  $\geq -3$  and  $< -2$
  - MUAC  $\geq 16.0$  to  $< 18.5$  cm
- Children 15-18 years
  - MUAC  $\geq 18.5$  to  $< 22.0$  cm
  - BMI  $\geq 16.0$  to  $< 17.0$ cm
- Adults (non-pregnant/ post-partum)
  - MUAC  $\geq 18.5$  to  $< 22.0$  cm
  - BMI  $\geq 16.0$  to  $< 17.0$ cm
- Pregnant/ lactating women
  - MUAC  $\geq 19.0$  to  $< 23.0$  cm



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### 23.1.3 Malnutrition Investigations and Signs and Symptoms

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#### *Investigations*

- Laboratory examinations identify nutrient deficiencies:
  - For blood (Hb, haematocrit)
  - Protein (serum albumin)
  - Micronutrient (vitamin B12, iron, zinc, and folate)
  - Blood glucose
  - Lipid (cholesterol and triglycerides)

#### *Signs and Symptoms*

- Symptoms that affect food intake
  - Diarrhoea
  - Nausea
  - Vomiting
  - Anorexia
  - Mouth and throat sores
  - Oral thrush
- Signs of clinical malnutrition
  - Wasting and weight loss
  - Skin changes
  - Oedema
  - Apathy
  - Hair changes
- Signs of anaemia
  - Pale conjunctiva, gums, nails, and skin
  - Breathlessness
  - Rapid pulse
  - Oedema

*Dietary assessment*

- Information about the types and amounts of foods eaten, appetite, food habits and eating behaviours to identify factors that affect food intake such as side effects of medications

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**23.1.4 Management of Malnutrition in Adolescents and Adults**

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- Refer to *The National 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) OR the CSB should be used in combination with a normal diet

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**23.1.5 Treatment of Severe Malnutrition**

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- 2 pots of **Ready-To-Use Therapeutic Food (RUTF)** 260g, 2700 kcal per day OR 6 sachets of **RUTF** 92g, 3000 kcal per day depending on what is available

## 23. Nutritional Disorders

- If patients achieves BMI of 17 or MUAC of 22cm (in adolescents WHZ <-2 ) then treat as moderate malnutrition (*see Section 23.2.2 below*)

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### 23. 1.6 Treatment of Moderate Malnutrition

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- Give 4.5kg of **Likuni Phala** (containing 10% sugar) and one litre of **Vegetable Oil** per month (1500 kcal per day) OR 3kg of **Corn Soya Blend++** (Super cereal)

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### 23.1.7 Outpatient Follow Up

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- 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

---

### 23.1.8 Use of Milk Based Formulations F75 and F100

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- Patients requiring Naso Gastric (NG) feeding cannot tolerate **RUTF** or are severely ill require milk based formulations F75 and F100 feeds
- Patients should be weighed twice weekly
- Milk based formulations are given in two phases

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### 23.1.8.1 Phase 1

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- 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 IV 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

#### **Amounts of F75 given to patients in Phase 1**

Class of weight (kg)    8 feeds per day    6 feeds per day    5 feeds per day  
ml for each feed

---

15.0-19.9	260	300	400
20.0-29.9	300	350	450
30-60	350	400	500

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## 23. Nutritional Disorders

- Patients should not eat any other foods or fluids, during Phase 1 unless they have diarrhoea
- Patients with diarrhea should be given ORS (Resomal)

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### 23.1.8.1.1 Transition Phase

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- 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 IV fluids in which case amounts should be reviewed

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#### 23.1.8.2 Phase 2

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- 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

#### Amounts of F100 given in Phase 2

F100 (ml) per feed phase 2 for 6 & 5 feeds

Class of weight (kg)	MI per feed	MI per feed
	6 feeds per 24 hours	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**

## 23. Nutritional Disorders

- **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  
OR
  - 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

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### 23.1.9 Discharge Criteria (when to stop treatment of malnutrition)

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#### *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

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## 23.2 Malnutrition (protein-energy) in Children

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### 23.2.1 Mild malnutrition

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- 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

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## 23.3 Acute Malnutrition in Children

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### 23.3.1 Moderate Acute Malnutrition

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#### *Signs and Symptoms*

- *Children 6-59 months*
  - MUAC 11.5 to <12.5cm or
  - WFH -3z to -2z score and
  - No Oedema
  - Appetite
  - Clinically well
- *Children 5-12 years*
  - BMI for age -3z to <-2z score and
  - No oedema
  - All discharges from NRU or OTP

#### *Investigations*

- Look for visible signs of wasting
- Check whether the child has got good appetite



### *23. Nutritional Disorders*

- Check whether the patient has medical condition that will impair nutrition status e.g TB or HIV
- Determine severity of malnutrition using MUAC, Oedema, WFH and BMI for age

#### *Management*

- Refer to Supplementary Feeding Programme
- Do a full assessment, especially looking for underlying disease such as TB, HIV infection, etc.
- Refer all children who have not been immunized to the nearest MCH clinic
- Give **Vitamin A**
  - Child 12-59 months: 200,000IU
  - Child 6-11 months : 100,000IU
- Give **Iron +Folic Acid Supplementation**
  - <10kg: 1 tablet every two weeks
  - >10kg: 2 tablets every two weeks

### 23. Nutritional Disorders

- Give **Albendazole** or **Mebendazole** as follows:

AGE	ALBENDAZOLE	MEBENDAZOLE
<12 months	None	None
12 to 23 months	200mg single dose	100mg twice daily for 3 days
24 to 59 months	400mg single dose	100mg twice daily for 3 days

- Provide 200g of **CSB++** per day (3kg for 14 days)

#### *Follow Up*

- Follow up visits to SFP occur every 2 weeks
- At every visit assess nutrition status of the patient
  - Take weight and MUAC measurement at each follow up visit
  - Check for oedema at each follow up visit
  - Calculate WFH Z score or BMI for age at each follow up visit
  - Assess nutrition status for possible discharge or referral

#### *Referral to OTP or NRU*

- If the child 6 months to 12 years in SFP deteriorates and meets OTP admission criteria, refer to OTP

- If the child 6 months to 12 years deteriorates in SFP, cannot be treated in OTP and now meets the admission criteria for NRU refer to NRU

---

### 23.3.2 Severe Acute Malnutrition without Complications

---

#### *Signs and Symptoms*

- Children 6-59 months
  - MUAC <11.5cm or
  - WFH <-3Z scores or
  - Oedema +1 or +2
  - With
    - ✓ Appetite for RUTF
    - ✓ Clinically well
  - If the child is HIV + admit to OTP with MUAC <12.5cm
- Children 5-12 years
  - MUAC <13.0cm (5-9 years)
  - MUAC <16.0cm (10-12 years) or
  - BMI for Age <-3Z score or Oedema +1 or +2
  - With
    - ✓ Appetite
    - ✓ Clinically well

#### *Management*

- Triage urgent cases
- Conduct Anthropometric Assessment
- Conduct Appetite test
- Conduct medical assessment
- Admit the child in the Outpatient Therapeutic Programme

*Routine Medical Treatment*

- Give **Vitamin A Supplementation**
  - 6-11 months (100, 000IU)
  - 12 months-12 years: 200, 000IU
  - Give **Vitamin A** on admission
    - ✓ Do not give to children with oedema
    - ✓ Do not repeat the dosage of **Vitamin A** if the child is readmitted or has already received curative dose of **Vitamin A** during the last 6 months
  
- Give **Amoxicillin** as follows:

<b>Weight of the Child (KG)</b>	<b>Syrup 125mg/5ml</b>	<b>Syrup 250mg/ml</b>	<b>Tablets 250mg</b>
	Dosage-give tds		
≤ 2.0	62.5mg (2.5ml) 3X per day	62.5mg (1.25ml) 3X per day	62.5mg (¼ tablet) 3X per day
2.0-9.9	125mg (5ml) 3X per day	125mg (2.5ml) 3X per day	125 (½ tablet) 3X per day
10.0-30.0	250mg (10ml) 3X per day	250mg (5ml) 3X per day	250mg (1 tablet) 3X per day
>30.0	Give tablets	Give tablets	500mg (2 tablets) 3X per day

### 23. Nutritional Disorders

- Give on admission except for children under 2kg
- If **Amoxicillin** is not available, use **Cotrimoxazole** according to IMCI protocol
- Give **Folic Acid**
  - Give on first day
  - Give to all beneficiaries
  - Give 5mg single dose
- **Antimalarials**
  - **LA should only be prescribed if there is a positive diagnostic test**

WEIGHT (KG)	DOSE
5-14.9	1 TABLET (2x/day/3 days)
15-24.9	2 tablets (2x/day/3 days)
25-35	3 tablets (2x/day/3 days)
>35	4 tablets (2x/day/3 days)

- Give **Albendazole or mebendazole**

AGE	ALBENDAZOLE	MEBENDAZOLE
<12 months	None	None
12 to 23 months	200mg single dose	100mg twice daily for 3 days
24 to 59 months	400mg single dose	100mg twice daily for 3 days

- If the child is transferred between OTP and NRU ensure that this dose is not repeated

#### *Nutritional management*

- Ready to Use Therapeutic Food (RUTF) is used to treat patients with SAM in OTP

## 23. Nutritional Disorders

- The amount of RUTF is based on weight of the patient (Refer to Table 9; RUTF Ration Table in the Guidelines for Community management of Acute malnutrition)
- Give the required RUTF to the carer
- Counsel the carer on how to give the RUTF to the child

### *Follow Up*

- The patient should come every week for nutrition assessment, medical checkup and to receive weekly supply of **RUTF**
  - Key activities should be done to assess the patient
    - ✓ Take weight and MUAC measurements
    - ✓ Calculate nutritional status
    - ✓ Review target weight for discharge
    - ✓ Assess for any illness since the previous visit
    - ✓ Conduct physical assessment for any illness
    - ✓ Conduct appetite test for RUTF
    - ✓ Make decision if there is need for any additional management
    - ✓ Reinforce key health and nutritional key messages

### Referral

- Children should be transferred to NRU if:
  - Medical condition deteriorates or any condition develops
    - ✓ The child refuses RUTF
    - ✓ There is an increase in bilateral pitting oedema (or Oedema appears when it was previously absent)
    - ✓ There is weight loss for 3 consecutive OTP sessions
    - ✓ There is static weight (no weight gain) after five consecutive OTP sessions
    - ✓ Discharge criteria have not been reached after 3 months in OTP

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### 23.3.3 Severe Acute malnutrition with Complication

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#### Signs and Symptoms

- Bilateral Pitting Oedema +3
- Marasmic Kwashiorkor
  - MUAC <11.5cm (6-59 months)
  - MUAC <13.0cm (5-9 years)
  - MUAC <16.0cm (10-12 years) or
  - WFH <-3Z score (6-59 months)
  - BMI for Age <-3Z score (5-<12 years)

#### Together with

- Any grade of Oedema +/++
- MUAC <11.5 or WFH <-3Z score (6-59 months)

### 23. Nutritional Disorders

- MUAC <13.0cm (5-9 years, MUAC <16.0cm (10-12 years or BMI for Age <-3Z score (5-12 Years) or
- Bilateral Pitting Oedema + and ++

With any of the following medical complications

- Anorexia, poor appetite
- High Fever
- Hypothermia
- Vomiting
- Severe dehydration
- Severe anaemia
- Not alert, very weak, apathetic, unconscious, convulsions
- Moderate to severe skin lesions
- Difficult or fast breathing

#### *Special Cases*

- All infants >6 months and weighing <3kg or
- Infants <6 months who meet any of admission for NRU as follows
  - *Visible severe wasting*
  - *Bilateral Pitting Oedema*
  - *WFH <-3Z score (for children ≥45cm*
  - *Static weight or not gaining weight or losing weight for 3 consecutive weighing in GMP but not severely malnourished*
  - *Mother reports that she does not produce enough milk and infant is not gaining weight on breastmilk despite counseling on appropriate breastfeeding technique and attachment*



- *Infant if sick, feeble and not suckling well but not severely malnourished*
- Referrals from OTP

### *Management*

- Must be admitted to hospital
- Do a full assessment, especially looking for underlying disease such TB, HIV infection, etc.

Assess and treat common complications and other medical condition (as indicated in the CMAM Guidelines; 2012 Edition) such as:

- Hypoglycaemia
- Hypothermia
- Diarrhoea
- Dehydration
- Severe anaemia
- Skin lesions
- Eye problems
- Oral Candidiasis

### *Nutrition Management*

- Phase 1
  - **F75** is used to stabilize malnourished children in Phase 1 of treatment
  - Give 8 feeds of **F75** per day (every 3 hours). This will assist to prevent hypoglycaemia and Hypothermia

- Give **F75** to all children except infants <6 months where breastfeeding is being established. For these infants use **F100-D** except if Oedema is present
- Continue breastfeeding on demand

#### *Preparation of F75*

- Mix one packet of **F75** with 500ml of cooled boiled water (see annex 5-3 in the CMAM Guidelines 2012 edition)
- If pre-packed **F75** is not available use one of the recipes (Annex 5-12 in the CMAM Guidelines 2012 Edition)

#### *Amounts to Give in Phase 1*

- Amounts to give depends on the admission weight
- Keep the amount the same for all of Phase 1 even if the child is gaining or losing weight

#### *Transitional Phase*

- Criteria to progress from Phase 1 to Transition Phase
  - The child has good appetite (easily finishes feeds)
  - Bilateral Pitting oedema is subsidizing
  - No serious medical complications

- Nutrition Treatment in Transition Phase
  - **RUTF** is introduced alongside **F75** in preparation for Phase 2
  - Last for 2-3 days
  - The number of feeds, their timing and the volume remains the same as in Phase 1
  - Give the caregiver the daily ration amount of **RUTF**. The caregiver should give the child **RUTF** throughout the day
  - After every 24-hour period, note the quantity of RUTF consumed
  - Give the child safe drinking water with RUTF in between feeds
  - Every three hours provide Phase 1 ration of F75
  - If the child is breastfed, breastfeeding should continue throughout the day and night
  - When the child finishes 50% of RUTF, reduce the volume to 50 % of the normal F75 ration
  - Stop F75 when the child is able to finish 75-100% of the daily RUTF ration
  - Give RUTF and water only. Observe for at least 24 hours eating RUTF to ensure he/she does not develop complications
  - If the child develops complications return him/her to Phase 11 and provide appropriate medical care.

## 23. Nutritional Disorders

### *Discharge Criteria from NRU to OTP*

- Appetite returned
- Medical condition resolved or stabilized (for chronic conditions).
- Bilateral pitting oedema subsidizing

### *Transition Phase in Classical Approach*

- Where **RUTF** is not available or cannot be used Classical or Traditional Approach should be used in transitional phase
- **F100** is used in the classical transitional phase.
- The number of feeds, timing and volume given remains exactly the same as in Phase 1 (see annex 5.4 of the CMAM Guidelines 2012 Edition)
- Breastfeeding should continue on demand

### *Preparation of F100*

- Mix one packet of F100 with 500ml of cooled boiled water (see annex 5.3 in the CMAM Guidelines 2012 edition)
- If pre-packed F75 is not available use one of the recipes (Annex 5.12 in the CMAM Guidelines 2012 Edition)

### *Criteria for change to Phase 2*

- Transfer after 2 days in transition phase (if stable and no Oedema)
- If Oedema is present the child should remain in transition phase until all oedema has resolved

*Criteria of moving back to Phase 1*

- If there is any sign of fluid overload
- If tense abdominal distension develops
- If the patient gets significant re-feeding diarrhea so that there is weight loss
- If a complication arises that necessitates an intravenous infusion
- If the child loses his/her appetite for therapeutic milk and requires NG feeding

*Phase 2 (Rehabilitation Phase)*

- **F100** (High energy milk) is used in this phase
- Children should be given unlimited intake of **F100**
- Give 6 feeds of **F100** per day
- Offer 2 feeds of **CSB++**
- Breastfeeding should continue on demand as usual
- Give **F100** milk according to weight (see annex 5.6 of CMAM Guidelines 2012 Edition)
- Encourage the child to eat until full

*Routine Medical Treatment and Prophylaxis*

- Vitamin A: (on day 1, Day 2) as follows:

AGE	<b>Vitamin A</b> orally on day 1 and 2 (and day 14 if the child stays in NRU)
<6 months	50, 000 IU (2 drops or one third red cap)
6 to 12 months	100, 000 IU
>12 months	200,000 IU

- Antibiotic Regime in NRU

On admission if	Give
No complications	<b>Amoxicillin</b> orally, 15mg/kg tds for all of Phase 1 and four days extra
Complications	Give <b>Benzyl penicillin</b> 50,000iu/kg q6h IV/IM for 48 hours then oral amoxicillin 15mg/kg tds for 5 days AND If the child fails to improve within 48 hours add <b>Gentamycin</b> 7.5mg/kg q24h IV/IM for 7 days or <b>Chloramphenicol</b> 25mg/kg IM/IV q8h for 5 days Other antibiotics based on specific diagnosis
If child is HIV infected or exposed give cotrimoxazole preventive therapy (CPT)	<b>Cotrimoxazole:</b> <6 months-120mg/day >6 months-5 years 240mg od >5 years-480mg od

- Assess dehydration (see *Section 7.5.1.4*)
  - 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*)

- The fluid tolerance of these children is limited. **ReSoMal** and especially IV 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 IV 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

**Note:** Frequent feeds spaced throughout the whole 24 hours are essential to prevent hypoglycaemia

- Provide antibiotic cover for 5 days
  - Give **Cotrimoxazole** 24 mg/kg bd

*Alternatively if sepsis suspected or child very ill:*

- Give **Benzyloxyethyl penicillin** 50,000 units/kg IM or IV q6h, and
- Give **Gentamycin** 6 mg/kg IM or IV q24h

*Alternatively to Gentamycin:*

- Give **Chloramphenicol** 25 mg/kg IM or IV q8h

If the child improves, then switch to oral **Ciprofloxacin** for 5 days

*Give supplements:*

- Give **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
- Give **Potassium** 1 mmol/kg qid 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<sup>+</sup>)

*From day 7:*

- Give **Ferrous sulphate** paediatric mixture 2.5 mL bd for 2 weeks *plus*
- Give **Folic acid** 5mg od for 5 days
- Give **Albendazole** 400 mg single dose, when recovering
  - Children <2 give 200 mg
- Treat complications:
  - *Hypothermia:*
    - ✓ Re-warm
    - ✓ Consider the possibility of sepsis or hypoglycaemia
  - *Hypoglycaemia:*
    - ✓ Give **Dextrose 50%**
    - ✓ *See Section 5.4 for dilution, dose, administration*
    - ✓ Then give **F75** orally or via NGT as soon as possible and recheck the blood sugar after 1 hour

**Note:** Hypothermia and hypoglycaemia are frequently signs of sepsis. Consider sepsis treatment if present

- *Cardiac failure:*
  - ✓ Give **Frusemide** 1-2 mg/kg IV or IM
  - ✓ Digoxin is contraindicated in kwashiorkor

- *Severe anemia:*
  - ✓ Transfuse 10 mL/kg packed cells
- *Mouth ulceration:*
  - ✓ If not severe use **GV Paint**
  - If severe like cancrum oris use:*
    - ✓ Give **Benzylpenicillin** 25,000 units/kg per dose IM q6h and
    - ✓ Give **Metronidazole** 7.5 mg/kg every tds for 7 days
- *Skin ulcers:*
  - ✓ Soak lesion with **Potassium Permanganate 1% solution** for 10-15 minutes *then*
  - ✓ Apply a **paraffin Gauze** dressing

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#### 23.4 Pellagra

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- Usually multiple vitamin deficiency is present and other vitamins may therefore be necessary

##### *Treatment*

- Give **Nicotinamide** 50 mg every tds for 28 days

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#### 23.5 Vitamin A Deficiency, Xerophthalmia

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##### *Prevention*

- Give **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

## 23. Nutritional Disorders

**Note:** Xerophthalmia is a medical emergency

### *Treatment*

#### *Adults*

- Give **Vitamin A** 200,000 units/ dose on days 1, 2, and 8

#### *Children*

- Give **Vitamin A** < 1:100

## 24.0 Palliative Care

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- 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*

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## 24.1 Pain Management in Palliative Care

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### 24.1.1 Areas to Consider in Pain Management

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- Effective pain control requires:
  - Holistic assessment including psychological, spiritual, and social aspects
  - Accurate diagnosis of the cause: defined as somatic and neuropathic
  - Appropriate analgesics: Non opioid, opioids and adjuvants
  - To consider:
    - ✓ Radiotherapy if available
    - ✓ Chemotherapy if available

- ✓ Surgical / orthopaedic procedures
- ✓ Neurolytic procedures if available

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### 24.1.2 Principles of Analgesic Use

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- 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 patient
  - Dosage is determined on an individual basis
- By the ladder
  - Three step analgesic ladder with treatment moving up as pain increases should be used when prescribing analgesics

### 24.1.3 The WHO Analgesic Ladder

- The choice of analgesic drugs should be based on severity (intensity), type (neuropathic or nociceptive) and cause of pain



#### Mild Pain - Step 1

- Give **Paracetamol** 500mg - 1g every 4-6 hours (max 4g daily)
- Give **NSAIDS** anti-inflammatory effects are good for metastatic bone and soft tissue pains
- Give **Aspirin** 300-600mg every 4-6 hours
- Give **Ibuprofen** 400mg P.O every 6-8 hourly (max 1.2 g daily), children >7kg 20mg/kg (max 40mg/kg/day)
- Give **Diclofenac** (NSAID) 50 mg, PO 8hourly (max 150mg)

**Notes:**

- Do not give **Aspirin** to children under 16 years because of the risk of Reye's syndrome
- Aspirin causes gastric irritation and ulceration, therefore administer with food and milk
- 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 or in asthmatic patients
  - ✓ Do not use two **NSAIDs** at the same time

*Moderate Pain - Step 2*

- **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
- Give **Tramadol** 50-100 mg every 8 hours oral
- Always prescribe codeine with a laxative (not tramadol) e.g. Give Bisacodyl 10mg at night, unless the patient has diarrhoea

*Severe Pain - Step 3 (strong opioid)*

- Give **Morphine** – a drug of choice for severe pain
- Can be sedaloned with non-opioids for severe pain

- Oral **Morphine** (1 mg/ml) solution starting dose 2.5ml - 5mls, 4 hourly and double dose at night (10pm) titrating upwards every 12 hours to achieve pain control
- Patients who were previously on **Codeine** should start on morphine 10mgs po 4 hourly
- For children, 0.2- 0.4mg/kg po 4 hourly (max 3mg)
- Cachexic patients start **Morphine** with a low dose 2.5mg 4 hourly
- Elderly / frail patients start **Morphine** at 2.5mg po 6-8 hourly due to potential risk of renal impairment
- Where **Oral Morphine Tablets (MST)** is available start with 10mg tablets bd 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 diarrhoea
- Nausea and vomiting are common side effects and may require medical management if persist after 24 - 48 hours
- Morphine does not have a ceiling effect and must be titrated up to gain effective control of pain



## *24. Pain Management and Palliative Care*

- Increase Morphine dosage by 30-50% of the normal dose, for maximum pain control
- For breakthrough pain, give the regular dose of Morphine as a "rescue" dose as often as required and keep record
- Initiate Weak Liquid Morphine (1mg/ml) and if the required dose is very high can be changed to Strong Morphine (10mg/ml) 4 hourly
- If patient cannot swallow, Liquid Morphine can be administered through bucal and rectal
- Use fentanyl patches if available as soon as pain is under control for maintainance

### **Note:**

- Never prescribe more than one modified release opioid at a time
- Explain common opioid side effects to patients (constipation, drowsiness, nausea)
- If pain has been controlled reduce the dose gradually to avoid withdraw symptoms (sweating nausea, agitation)
- For painful procedures (dressing, fracture reduction), give **Morphine** 5mg start (adult) or 0.2- 0.4mg/kg (children) 3- 40 minutes before procedure to reduce pain and distress. If the procedure is repeated you can titrate the dose to the best effect.

## 24. Pain Management and Palliative Care

- For regional anaesthesia (epidural, caudal, or specific LA blocks) and chronic pain relief can give bupivacaine 0.1% - 0.5% (preservative free), ropivacaine (preservative free) 0.1%. For management of local anaesthetic toxicity refer - dental section
- **Pethidine** is not recommended for use in chronic pain due to its short duration of action and its side effects

### *Adjuvant Analgesics*

- Drugs useful in pain that is only partially sensitive to opioids, such as neuropathic and bone pain, smooth or skeletal muscle spasms, or pain related to anxiety
- Can be used alone, or in conjunction with step 1, 2 and 3 analgesics

### *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
  - Give **Dexamethasone** 4 - 8mg in divided doses daily for a minimum of 10 days
  - For increased intracranial pressure start 24mg daily and reduce by 2mg daily to the lowest effective dose

## 24. Pain Management and Palliative Care

- For nerve compression 8mg daily
- For spinal cord compression 16 mgs

### *If dexamethasone not available*

- Give **Prednisolone** 30 - 50mg od for 10 days
- Then reduce gradually to lowest effective dose, depending on prognosis
- In advanced disease, corticosteroids can improve appetite, decrease nausea and improve quality of life

### *Monitor side effects such as:*

- Neuropsychiatric syndrome
- GIT disturbance
- Immuno suppression

### *Anti-depressants*

- Helpful for neuropathic pain, which may present as burning, pricking, allodynia, paraesthesia or sharp, shooting pain

### *For adults*

- Give **Amitriptiline** 25mg at night. Dose can be increased slowly up to 75mgs

### *For children*

- 2-12 years: 0.2 - 0.5mg/kg po at night
- 12 -18 years: 10-25mg/kg po at night

## 1.1 14. Hiccup

This is a relatively common symptom in advanced disease which causes distress to the patient

### 1.2 Common Causes

- Irritation of the phrenic nerve by tumour involvement at the hilum of the lung.
- Direct irritation of the diaphragm (infection, tumour).
- Uraemia.
- Dyspepsia (especially with hiatus hernia).
- Elevation of diaphragm (from enlargement of the liver or ascites).
- CNS tumour.

### 1.3 Management

- Immediate:
- Pharyngeal stimulation e.g. by swallowing dry bread or two teaspoons of sugar.
  - Correct uraemia if possible.
  - Simple re-breathing from a paper bag to elevate pCO<sub>2</sub> level.
  - Drugs:
    - (i) Haloperidol 0.5mg bd orally or 1.5mg intramuscularly during attacks.
    - (ii) Chlorpromazine 12.5- 25mg bd. or prn during attacks (although its sedative effect may distress the patient).
    - (iii) Metoclopramide 10mg qid or domperidone 10-20mg qid may be quite effective if due to gastric distension.
    - (iv) Muscle relaxants e.g. baclofen 5-10mgs TDS are effective for some patients

## 24. Pain Management and Palliative Care

### *Anti – convulsants*

#### *Adults*

- Give **Phenytoin** 100mg bd, maybe increased slowly to 100mgs tds
- Give **Carbamazepine** 100 - 200 mg tds

#### *Children*

- 2-12 years 10/kg day 1, then bd day 2, tds day 3

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### **24.5.3 Antispasmodics**

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- Helpful in relieving visceral distension pain and colic
- Give **Hyoscine butylbromide** 10-20mg every 8 hours tds orally

#### *Children*

- 1 month – 2 years give 0.5mg/kg po 8 hourly
- 2-5 years give 5mg po 8 hourly
- 6-12 years give 10mg po 8 hourly

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### **24.5.4 Muscle Relaxants / Anxiolytics**

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- Helpful in painful muscle spasms (cramps), myofascial pain and anxiety related pain

#### *Adults*

- Give **Diazepam** 2.5mg every 8 hours

*Children*

- 6 - 14 years give 2-10mg/day in 2 or 3 divided doses

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**24. 5 Management of Common Symptoms in Palliative Care**

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*General Approach*

- Assess cause and severity
- Treat reversible causes
- Initiate disease specific palliative care (drug and non-drug measures)
- Involve and explain the plan to patient and family
- Review

**1.1 16. Halitosis - an unpleasant or bad breath**

**Common causes :** Poor dental and oral hygiene, Oral thrush, Dry mouth – loss of saliva, mouth breathing, dehydration, Gingivitis (gum infection), sepsis in the mouth, pharynx, nose, nasal sinuses, lungs tonsillar disease, lung abscess/cancer and necrotic ulcers

**1.2 Management**

**1.3 General Measures**

Good oral hygiene

- The patient may be unable to do this for himself,
- Cleaning with soft tooth brush
- Rinse the mouth with salty water or diluted lemon juice
- Encourage oral fluids, chew or suck small pieces of fruit( pine apple or orange)
- Mouth wash and paste- crushed flagyl + sobo+crushed steroids (prednisolone) to reduce odour and pain

## 1.1 23. Squashed Stomach Syndrome

This is a reduction in stomach capacity leading to a feeling of fullness after taking only a small amount of food.

### 1.2 Clinical Features

- Early satiety / constant feeling of fullness
- Oesophageal regurgitation
- Indigestion

### Common causes

Liver enlargement, gross ascites, pelvic tumours, e.g. ovarian, bowel

### Management

- Small frequent meals
- Antacids – to remove gas, thus increasing stomach capacity
- Antiemetics, e.g. Metoclopramide 10mg tds, taken 30 mins before meals, to control nausea and speed gastric emptying
- Steroids – to reduce tumour size



**1.1 18. Anorexia - loss of appetite**

**1.2 Common Causes**

- Cancer
- Opportunistic infections
- Pain
- Weakness / fatigue
- Treatment side-effects – antibiotics, chemotherapy
- Gastrointestinal problems – sore mouth, dysphagia
- Anaemia
- Changes in taste sensation – common in cancer and HIV
- Psychological causes – depression, anxiety, fear
- Disease process – anorexia increases as disease progresses
- Unappetizing food, poorly presented
- Strong food smells during cooking – may cause nausea

**1.3 Management**

- Explain to the patient and family that anorexia is normal as disease progresses
- Identify and treat underlying causes, if possible
- Encourage small, frequent meals of the type of food which the patient likes
- Present food attractively
- Cook food away from where the patient is, to reduce cooking smells
- Don't force feed
- Encourage the patient to eat with other family members – appetite is usually better when meals are eaten in company
- Encourage the patient to sit in an upright position when eating
- Encourage gentle exercise, to promote appetite
- Appetite stimulants – eg. Prednisolone 10mg tds, before meals; small amounts of alcohol
- Drugs, e.g. antiemetics to reduce nausea, Metoclopramide to speed up gastric emptying.
- Generally contraindicated in advanced cancer.

## Management of Nausea and Vomiting in Palliative Care in Adults

### *Treat*

- Oral/oesophageal candidiasis
- Constipation
- Infections – malaria, gastroenteritis, urinary tract infection etc.,
- Indigestion/heartburn

### *Care*

- Review new medication that may have caused nausea/vomiting
- Encourage clear fluids – small sips better absorbed
- If the patient is dehydrated give ORS
- Ginger chewed or boiled as a drink may help

### *Prescribe*

- Nausea and vomiting can arise from many different causes and respond to particular drugs – see table below
- If vomiting is severe, injectable anti-emetics are best until the vomiting is controlled

Pattern of nausea and vomiting	Causes	Suggested drugs
<b>Poor stomach emptying:</b> <ul style="list-style-type: none"> <li>Main symptom is vomiting</li> <li>Vomiting relieves nausea</li> <li>Patient feels full quickly</li> <li>May have reflux</li> </ul>	<ul style="list-style-type: none"> <li>Opioids</li> <li>Constipation</li> <li>Stomach &amp; bowel conditions</li> </ul>	<ul style="list-style-type: none"> <li>Metoclopramide 10-20mgs tds before meals <b>or</b></li> <li>Domperidone 10-20mg bd</li> </ul>
<b>Blood chemistry disturbances</b> <ul style="list-style-type: none"> <li>Nausea is the main symptom</li> <li>Vomiting does not relieve nausea</li> </ul>	<ul style="list-style-type: none"> <li>Drugs</li> <li>Renal failure</li> <li>Hypercalcaemia</li> </ul>	<ul style="list-style-type: none"> <li>Haloperidol 1.5mg nocte <b>or</b></li> <li>Prochlorperazine 5-10mg tds</li> </ul>
<b>Inflammation or swelling in the head</b> <ul style="list-style-type: none"> <li>May be worse on movement</li> <li>Vomiting does not relieve nausea</li> <li>May be worse in the morning</li> </ul>	<ul style="list-style-type: none"> <li>Ear infections</li> <li>Brain tumours</li> <li>Meningitis</li> <li>Malaria</li> </ul>	<ul style="list-style-type: none"> <li>Prochlorperazine 5-10mg tds <b>or</b></li> <li>Cyclizine 25-50mg tds</li> </ul>
<b>Vomiting with diarrhoea</b> <ul style="list-style-type: none"> <li>Exclude constipation with overflow</li> </ul>	<ul style="list-style-type: none"> <li>Infectious diarrhoea</li> </ul>	<ul style="list-style-type: none"> <li>Promethazine 25mg tds <b>or</b></li> <li>Cyclizine 25-50mg tds</li> </ul>
<b>Partial bowel obstruction</b> <ul style="list-style-type: none"> <li>Large volume vomiting</li> <li>Patient still passing occasional flatus/stools</li> </ul>	<ul style="list-style-type: none"> <li>Constipation</li> <li>Abdominal or pelvic tumour</li> </ul>	<ul style="list-style-type: none"> <li>Metoclopramide 10-20mg IM. <b>STOP if increasing abdominal pain and prescribe as below</b></li> </ul>
<b>Complete bowel obstruction</b> <ul style="list-style-type: none"> <li>Large volume vomiting</li> <li>Patient <b>not</b> passing flatus or faeces</li> </ul>	<ul style="list-style-type: none"> <li>Abdominal or pelvic tumour</li> </ul>	<ul style="list-style-type: none"> <li>Promethazine 25mg s/c tds <b>or</b></li> <li>Cyclizine 50mg s/c tds</li> </ul>

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## **Chapter 25: Psychiatric Conditions**

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These are the common conditions covered in this chapter:

- Organic mental disorders – delirium and dementia
- Alcohol and drug use related disorders
- Psychotic disorders – schizophrenia
- Mood disorders – depression and bipolar affective disorder
- Anxiety disorders
- Mental disorders during pregnancy and postpartum period

### **25.1 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

## *25. Psychiatric Conditions*

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

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### **25.2 Organic Mental Disorders**

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#### **25.2.1 Delirium**

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- Sudden onset of confusion often accompanied by impairment of consciousness and agitated behaviour often caused by underlying organic conditions (e.g. infections) and usually reversible

#### *Signs and Symptoms*

- Confusion
- Agitation
- Perceptual disturbances
- Possible physical complaints such as headache or fever
- Fluctuating level of consciousness
- Disorientation
- Raised temperature
- Sweating
- Hallucinations and delusions

*Investigations*

- Look for possible causes:
  - Systemic and CNS infections
  - Hypoxia
  - Hypo- or hyperglycaemia
  - Drugs
  - Alcohol intoxication or withdrawal
  - Post-convulsion phase in epilepsy
  - Head trauma
  - Subdural hematoma
  - Stroke etc.

*Full physical examination including vital signs*

- Full blood count
- Urine/ Blood glucose test
- Blood film or rapid diagnostic test for malaria
- Consider LP for CSF analysis if suspect meningitis or encephalitis
- Advisable to determine HIV serostatus

*Treatment*

- The aim of the treatment is to control the behavioural disturbances in order to allow identification and management of the underlying cause (e.g. infections, alcohol withdrawal, hypoglycaemia etc)
- For behavioural disturbances or aggression give short course of low dose of antipsychotic medications, preferably orally

## 25. Psychiatric Conditions

- 1st line: **Chlorpromazine** 50 - 100mg bd or **Haloperidol** 2 - 5mg bd for 7 days or until agitation / confusion resolves
- If the patient is refusing oral medications, use **Chlorpromazine** 50 – 100mg IM bd or **Haloperidol** 2.5 – 5mg IM bd until sufficiently improved to accept medications orally
- If agitation is severe consider adding **Diazepam** 5 – 10mg po or slow IV push for short time or until less agitated (3-5 days)
- Nurse the patient in calm, quiet and well-lit environment with frequent reassurance and orientation

### *Red Flags*

- For referral
  - Decreasing level of consciousness
  - Worsening physical health
  - Investigations required not available at health facility
- For admission
  - If underlying condition and behavioural disturbance cannot be managed at home or health facility
  - Note:** Intravenous or high dose **Diazepam** can cause respiratory depression/ distress

### *Follow-up*

- If agitation is severe review the patient regularly

## 25. Psychiatric Conditions

- As an outpatient review at least every 24-48 hours until stable
- If admitted review every 8 hours until stable
- Once symptoms have resolved, stop antipsychotics and arrange review in 5-7 days' time to ensure patient remained stable

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### 25.2.2 Dementia

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#### *Signs and Symptoms*

- Forgetfulness
- Deterioration in personal hygiene and social interaction
- In later stages:
  - Wandering away from home
  - Poor memory of recent events
  - Disturbances of orientation
  - Personality changes such as irritability, and suspiciousness (sometimes persecutory delusion)

#### *Investigations*

- Formal memory tests can also be used; for example, ask patient to:
  - Give the names of 3 common objects and repeat them after about 3 minutes
  - Accurately identify the day of the week, month, year etc (as appropriate)
  - Give their full name and where they live



## 25. Psychiatric Conditions

***Any impairment symbolises possibility of dementia, then***

- Do physical examination to look for possible causes such HIV, high BP, alcohol, vitamin deficiencies etc.
- Assess for depression which can cause confusion in elderly

### ***Treatment***

- The aim of treatment is supportive
- Maintain patient's physical health – good diet exercise, personal hygiene
- Treat any physical illness promptly
- Encourage patient to use remaining abilities as much as possible
- Use reminders and prompts to help memory
- If depressed, refer to depression section for treatment details
- If the psychotic symptoms are prominent, use low dose antipsychotic medications
  - 1st line: **Haloperidol** 1.25-2.5mg po od/bd until the symptoms resolve or
  - 2nd line: **Risperidone** 0.5 – 1mg po od/bd until the symptoms resolve
  - Consider long term antipsychotic medication use if the psychotic symptoms persist after stopping the medication.
  - If possible, avoid use of medication especially sleeping tablets (e.g. Diazepam) as they make confusion worse. Aspirin in low doses may slow down vascular dementia

### **Red Flags**

- Admission
  - If there is sudden increase in confusion in known cases of dementia which may be due to acute infection, toxic reaction to medication, acute psychosis, misuse of alcohol or drugs (rule out Delirium or Acute Psychosis)
  - If the possible cause is treatable or manageable diseases such as HIV, High blood pressure

### **Follow-up**

- Consider reviewing the patient once a week until stable
- Once the condition is stable, review once a month
- Always do a physical check up to rule out comorbid illnesses which can complicate the dementia
- Assess risk for committing suicide
- Consider stopping antipsychotics if symptoms resolve
- Consider continuing with low dose antipsychotic medications if the psychotic symptoms persist
- Assess for and treat moderate - severe depression in the carers (guardians)

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## 25.3 Alcohol Related Disorders

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### 25.3.1 Alcohol intoxication

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- Behavioural change with disinhibition, potentially agitated and aggressive behaviour after recent ingestion of alcohol

#### *Signs and Symptoms*

- Argumentativeness
- Lability of mood
- Impaired attention and judgment, and interference with personal functioning
- Unsteady gait
- Difficulty standing
- Slurred speech
- Decreased conscious level
- Flushed face
- Conjunctival injection

#### *Investigations*

- Blood or breath alcohol (if available)

#### *Treatment*

- Management is primarily supportive until the effects of the alcohol have worn off
- If very aggressive then follow treatment guidelines for Violence and Aggression management

**Note:** Diazepam should be avoided as there is increased risk of respiratory depression

## 25. Psychiatric Conditions

### *Red Flags*

- Admission
  - If underlying condition and behavioural disturbance cannot be managed at home or health facility

### *Follow-up*

- Give advice about safe levels of alcohol intake and screen for alcohol use disorders (CAGE questionnaire)

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### **25.3.2 Alcohol Withdrawal Syndrome**

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- Acute confusional state that occurs within hours to days of cessation, or reduction of alcohol intake after prolonged (weeks to months) of heavy consumption
- The peak onset is at 24-48 hours post last ingestion and it can last for 7 – 10 days if untreated

### *Signs and Symptoms*

- Headache
- Nausea
- Anxiety
- Fevers
- Shaking
- Tremor
- Sweating
- Vomiting
- Increased pulse and blood pressure
- Agitation

## 25. Psychiatric Conditions

- Can present as Delirium Tremens with: confusion, marked agitation, aggression, hallucinations (frequently visual) and delusions, seizure

### *Investigations*

- Full physical examination including vital signs (to exclude other causes of delirium if present)
- Consider FBC LFT
- Blood/ Urine glucose

### *Treatment*

- The aim of treatment is to reduce the symptoms associated with alcohol withdrawal, which can result in seizures and potentially be fatal
- Primary treatment
  - A short course of oral **Diazepam** should be given at least four times a day, reducing in dose over a week to ten days, titrated according to symptom resolution; for example:
    - ✓ Diazepam 20mg qid for 2 days
    - ✓ Diazepam 10mg qid for 2 days
    - ✓ Diazepam 5mg qid for 2 days
    - ✓ Diazepam 5mg bd for 2 days

## 25. Psychiatric Conditions

- It should be accompanied by oral **Thiamine** supplements
  - ✓ Thiamine 300mg OD orally for 1 month
- Secondary /alternative treatment
  - If markedly agitated and unable to comply with oral medication IV **Diazepam** 5-10mg can be used up to 4 times per day until able to comply with oral treatment
    - ✓ High dose IM / IV thiamine can be given if available
    - ✓ IV fluids may be required if evidence of dehydration (low BP, tachycardic)

### *Red Flags*

- For admission:
  - Delirium tremens should be treated as an inpatient (medical emergency)
  - People with a high risk of seizures (previous seizures, known epilepsy, prolonged heavy alcohol use)
  - People with co-morbid physical illnesses (HIV, jaundice)

**Note:** The dose of **Diazepam** should be reduced in the physically frail of those with liver impairment

*Follow-up*

- If agitation is severe review the patient regularly
- As an outpatient review at least every 24-48 hours until stable
- If admitted review every 8 hours until stable
- Once detoxification complete offer advice regarding safe levels of alcohol intake and counseling support if planning to stop drinking

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**25.3.3 Wernicke -Korsakoff Syndrome**

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- Is characterized by confusion and drowsiness, ataxia and ocular disturbances (usually due to weakness or paralysis of 6th cranial nerve) including nystagmus
- May have acute onset or develop slowly over 1 week or so
- Korsakoff's psychosis is a state of amnesia that usually follows wernickes' syndrome
- This is due to thiamine (vitamin B1) deficiency in alcoholics and malnourished non-alcoholics

## *25. Psychiatric Conditions*

- Mostly anterograde amnesia (inability to retain new memories) and possibly retrograde amnesia (inability to recall the past),
- Fabricating answers or confabulating to cover their memory problems, and
- Oculomotor disturbances - nystagmus.
- Patient is alert but can be confused if having wernicke's disease, responsive and normal

### *Investigations*

- Substance use history
- String test to diagnose Korsakoff's psychosis (clinician asks the patient to take an imaginary string in his or her hands, and the patient complies, as though the string were real)
- Do a physical examination to rule out medical complications or comorbid illnesses
- Laboratory tests include FBC, offer PITC for HIV, LFTs, Urine/ Blood glucose test

### *Treatment*

- The aim is to rapidly treat Wernicke's syndrome in order to prevent onset of Korsakoff's psychosis



## 25. Psychiatric Conditions

- Immediately give **Thiamine (Vitamin B1)** 100 mg IV or IM followed by 100 mg IM or orally qd for the next 2 days for complete reversal of ocular abnormalities and ataxia
- Give **Glucose (5-10%)** IV with multivitamins orally and/or **Vitamin B Complex** can be given
- **Glucose** without **Vitamin B1** can worsen Wernicke's encephalopathy
- Advise the patient to abstain from alcohol use or consider alcohol detoxification to prevent alcohol withdrawal
- Always treat medical complications of chronic alcohol use such as GIT, neurologic, cardiovascular, pulmonary, hematologic and endocrine.
- To treat delirium tremens: *see alcohol withdrawal section*

### Red Flags

- For Admission
  - If delirium tremens or alcohol withdrawal is suspected
  - Severe medical complications of chronic alcohol use such as vomiting blood
  - Continued high risk alcohol use or multiple substance use

*Follow up*

- Review the patient once a week until the confusion resolves
- Assess for continued alcohol use and offer brief intervention to promote change in alcohol use on each visit
- Assess for and treat the medical complications

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**25.3.4 Alcoholic Hallucinosis**

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- Is a substance-induced psychotic illness which is a rare complication of prolonged heavy alcohol use, and often starts during a phase of abstinence.

*Sign and Symptoms*

- Perceptual disturbances
- Signs: auditory hallucinations in clear consciousness and while sober
- If insight is not present, may form basis for delusional thinking

*Investigations*

- Comprehensive alcohol use history from patient as well as guardians

*Treatment*

- The aims of treatment are abstinence and supportive care
- It is a self-limiting condition, symptoms resolve rapidly after ceasing alcohol consumption after a few months
- If symptoms persist for more than 6 months, consider giving antipsychotics (refer to the substance induced psychosis section)

## 25. Psychiatric Conditions

### *Red Flags*

- For admission
  - Persisting symptoms for more than 4-6 weeks of antipsychotic medication trial
  - Continued risky alcohol use
  - Severe medical complications
  - Emergence of more typical schizophrenia symptoms

### *Follow-up*

- Assess for emergency of schizophrenia symptoms on each visit once a month
- Assess for continued alcohol use and offer brief intervention
- Assess for and treat medical complication for chronic alcohol use

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### **25.3.5 Management of Physical and Neurological Complications of Alcohol Dependence**

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- Counsel the patient
- Abstinence may be essential
- Refer to Alcoholic Anonymous groups if available or link with other agencies such as religious organizations, social welfare services, etc
- 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) as per guidelines

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### 25.3.6 Treatment of Psychological and Social Complications

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- Counsel the patient using problem solving technique
  - Identify the problems
  - Prioritize the problems
  - Select the problem to be addressed
  - Think about all possible solution to the problem
  - Select the most appropriate solution
  - Implement the solution
- Educate and support the family

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### 25.4 Anxiety disorders

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- May be a perfectly normal response to stressful life events or circumstances
- Only illness if no obvious stress or threat, or worse than the situation warrants
- Types:
  - Panic disorder: characterized by spontaneous panic attacks
  - Generalized anxiety disorder: excessive worry about actual circumstances/ events

## 25. Psychiatric Conditions

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

### *Signs and Symptoms*

- Feeling tense and anxious and worry a lot about things
- Associated physical health symptoms, heart palpitations
- Sweating, chest pains or difficulty breathing, feeling dizzy, lightheadedness or faint

### *Investigations*

- Perform a physical examination to rule out other causes of anxiety such as thyrotoxicosis, asthma, etc.
- Elicit psychosocial stressors including alcohol and drug use from patients as well as guardians (carers)

### *Treatment*

- Explain anxiety to patient especially the link between physical and psychological symptoms
- Give good health advice such as reducing or stopping substance use, good diet, etc.
- Educate on relaxation methods such as breathing exercise during panic attack

## 25. Psychiatric Conditions

- If symptoms are severe prescribe
  - 1<sup>st</sup> line: Give **Diazepam** 2-10mg 2-4 times daily po for 5-7 days
  - 2<sup>nd</sup> line: Give **Amitriptyline** 50-150mg nocte po for 4-6 weeks
  - 3<sup>rd</sup> line: Give **Fluoxetine** 20-60mg od (morning) po for 4-6 weeks
- Psychotherapy such as cognitive behavioural therapy (CBT) if available

### *Red flags*

- For referral/admission
  - If there is significant comorbid physical illness
  - The symptoms are interfering with activities of daily living
  - The patient is suicidal with no significant psychosocial support at home

### *Follow up*

- Review patient once a week until symptoms resolve
- Once symptoms resolve, continue treatment for 6 months and consider stopping thereafter
- Assess for substance use and other psychosocial stressors

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## 25.8 Psychiatric Emergencies

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### 25.8.1 Self-harm and Attempted suicide

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- An **act of self-harm** without suicidal intent is deliberately harming oneself, e.g. cutting oneself. A **suicide attempt** is an act of self-harm with suicidal intent but not resulting in death
- Both are to be taken very seriously because they are high risk factors for completed suicide in the future
- Risk of future attempt is raised if:
  - Underlying psychiatric disorder (depression, bipolar affective disorder, schizophrenia/ drug or alcohol misuse)
  - Ongoing suicidal thoughts or plans
  - Regret at having survived the attempt
  - Access to dangerous means (firearms/ agro-chemicals/ medicines etc)
  - Evidence of hopelessness, marked emotional distress
  - Previous self harm/ suicide attempts
  - Family history of completed suicide
  - Male gender, older age, lack of social support

## 25. Psychiatric Conditions

### *Sign and Symptoms*

- Evidence of injuries from or history of actual suicide attempt method e.g. hanging, poisoning, drowning, etc.

### *General Management*

- Asking about suicidal thoughts in a routine assessment
  - First establish a good relationship
  - Ask how they feel about their life at the moment. How do they see the future for themselves? Do they ever think that life is not worth living?
  - Do they have thoughts about trying to harm them-self or end their life? If yes, have they made any plans harm themselves or end their life?
  - What has prevented them from acting on these thoughts? What protective factors are in their life? (family/ religious faith/ hope that things will get better)
  - Have they made at attempt to harm them-self end their life in the past? If yes, what happened?



## 25. Psychiatric Conditions

### Treatment

- If assessing someone presenting with a medically serious attempt at self-harm, first treat the underlying condition whilst ensuring that they are in a safe environment e.g. suture any wounds and manage bleeding, monitor appropriately if ingested poisons such as rat poison/fertiliser/ overdose of prescribed or over-the-counter medication
- All people with a self-harm/ suicide attempt should be referred for assessment by the district mental health team or local psychiatry services before leaving the health facility
- If there is current active suicidal ideation with a plan and access to dangerous methods, the person should be referred for assessment and possible admission by the psychiatry team urgently
- If suicidal thoughts are present but there is no plan and protective factors are in place, treat any underlying psychiatric disorder, give supportive counselling and monitor the suicidal thoughts at follow up visits. If the suicidal ideation does not improve, refer for assessment by the psychiatry team

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### **25.8.2 Acutely Disturbed or Violent Behaviour Management**

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- The vast majority of people with psychiatric disorders are never aggressive or violent
- However some factors do make it more likely that some people may become aggressive when unwell (active psychotic symptoms, agitation and over activity associated with mania, auditory hallucination, confusion and disorientation, alcohol or drug use)
- Other people attending health care facilities can also be aggressive or violent for a variety of reasons, so it is important to know how to manage this situation in a way that is safe for the patient, their carers and the health care staff
- Factors associated with violence or aggression
  - Young male
  - Previous or recent history of aggression
  - Drug or alcohol use
  - Increased impulsivity – eg delirium, brain injury, learning disability, dementia
  - Psychiatric disorders – e.g. schizophrenia with current active psychotic symptoms especially command hallucination or paranoid persecutory delusion, mania.

## 25. Psychiatric Conditions

### *Signs and Symptoms*

- Making verbal threats or shouting
- Agitation or irritability
- Suspiciousness/ anxious look
- Pacing up and down
- Actual physical aggression towards people or property

### *Investigations*

- Assess for biopsychosocial causes of the acute disturbed or violent behaviour

### *Treatment*

- The aim is to alleviate suffering and to prevent harm/ injury to the patient and the health care staff
- Also to allow investigation and management of the underlying cause of the aggression e.g. delirium, psychosis, mania

### *General Measures*

- De-escalation techniques and skills such as
  - First ensure your own safety - Move towards a safer place – avoid being trapped in a corner; have other staff or guardians with you;
  - Give clear, brief, assertive instructions
  - Explain your purpose or intention
  - Negotiate options and try to understand the reason for their distress
  - Avoid verbal and non-verbal threats
  - Allow greater body space than normal

## *25. Psychiatric Conditions*

- Pharmacological management (rapid tranquilization) may be optional if de-escalation fails
- Have at least four additional people to handle patient if rapid tranquilization is needed
- If patient comes while tied do not immediately remove physical restraints until safe to do so

*Steps of Rapid Tranquilization (RT)*

Step	Intervention	Dosages of Medication	Other/ Adjuvant treatment
1	De-escalation		
2	Offer oral treatment Repeat this up to 2 more time at 30-minute intervals if person remains agitated	<b>Haloperidol</b> 2.5-5mg or <b>Chlorpromazine</b> 100-200mg	With or without oral <b>Diazepam</b> 5-20mg or <b>Promethazine</b> 50mg
3	Consider IM treatment ( if the person doesn't accept oral medication or is not effective. These medications can be combined in one syringe & given into large muscle e.g. gluteus or deltoid	<b>Haloperidol</b> 5mg or <b>Chlorpromazine</b> 50-200mg or <b>Lorazepam</b> 1-2mg if available	<b>Promethazine</b> 50mg IM is an alternative in benzodiazepine-tolerant patients (people with alcohol dependence)
4	Consider IV treatment using large vein	<b>Diazepam</b> 10mg slow push over at least 5 min. repeat after 5-10 min if insufficient effect (up to three times)	<b>Note:</b> if giving IV <b>Diazepam</b> , care should be taken as it causes respiratory depression: patient could stop breathing
5	Seek expert advice		

## 25. Psychiatric Conditions

### General monitoring after RT

- Pulse
- BP
- Respiratory rate
- Temp
- If available, oxygen saturation should be monitored every 15 minutes for the first hours and then every 30 minutes until the patient is awake and alert
- Full physical examination including vital signs to determine if any physical cause for the aggression (e.g. delirium, drug or alcohol withdrawal)

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### 25.9 Psychotic Disorders

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- This is an umbrella term for a group of conditions where the person thinking, emotions and behaviour are affected
- They experience hallucinations, normally auditory and have unusual beliefs, which are often paranoid about other people
- They can behave in unusual ways and lack insight into the fact that they are ill

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#### 25.9.1 Schizophrenia

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##### Signa and Symptoms

- To diagnose schizophrenia there must be a **one month** history of symptoms listed below
  - Hallucinations (often auditory but can be visual etc) and delusions (fixed false belief) often paranoid/ suspicious in nature

## *25. Psychiatric Conditions*

- Speech can be irrelevant and incoherent
- Abnormal behaviour and at times agitation and aggression
- Lack of insight is prominent

### *Investigations*

- In a first episode of psychotic symptoms, physical causes for the symptoms must be excluded (delirium, drug and alcohol use/ withdrawal etc)
- Full physical examination
- FBC
- VDRL
- Urine drug screen if available
- Consider HIV serotesting.

### *Treatment*

- Treatment is both biological (medications) and psychological (supportive counselling about the illness, compliance with medication, education to the guardians)
- The aim of treatment is to remove all symptoms if possible and to help the person to return to their previous level of functioning

## 25. Psychiatric Conditions

- Primary treatment
  - First line commence an anti-psychotic medication which will need to be continued for **at least one year if this is a first episode or several years if the person has had many previous episodes**
  - Give **Chlorpromazine** 100-300mg nocte or **Haloperidol** 2.5-5mg nocte
  - All anti-psychotic medication have a delayed onset of action – advise the patient/ guardian it will take 1-2 weeks before improvement is noted
  - Advise about the side effects:
    - ✓ **Chlorpromazine**: sedation, postural hypotension, constipation, photosensitivity
    - ✓ **Haloperidol**: Extra-pyramidal side effects (EPSE) eg. tremor, stiffness of limbs/jaw, salivation
    - ✓ This dose can be increased at subsequent reviews if symptoms remain present
    - ✓ If EPSEs persist consider reducing the dose of anti-psychotic or adding **Benzhexol** 5mg daily



## 25. Psychiatric Conditions

- Secondary /alternative treatment
  - If symptoms have not improved on chlorpromazine or if the person has lots of side effects use a second generation anti-psychotic **Risperidone** 1-2mg nocte
  - Advice about side effects:
    - ✓ **Risperidone**: weight gain, sedation, impaired glucose tolerance OR
    - ✓ If compliance with medication is poor despite trying to reduce side effects and counselling on the importance of compliance with medication consider a long-acting depot anti-psychotic **Fluphenazine** 12.5mg IM into a large muscle (eg gluteal/ deltoid) as a test dose
    - ✓ Caution: risk of Acute Dystonic reaction (painful spasm of head and neck muscles)
    - ✓ If occurs give **Benzhexol** po if able to swallow
    - ✓ Otherwise IV/IM **Procyclidine** or **Benzhexol** 5mg OR slow IV push **Diazepam** 5-10mg
    - ✓ Advice about side effects: EPSE
    - ✓ Maintenance dose **Fluphenazine** 25-50mg IM every 4 weeks

## 25. Psychiatric Conditions

- ✓ If EPSE persist consider reducing the dose adding Benzhexol 5mg daily

### *Red Flags*

- For referral
  - If symptoms persist/ worsen despite 6-8 weeks of anti-psychotic medication at an effective dose
  - If side effects are not manageable
  - If the person has Catatonic symptoms (mute, maintaining unusual postures for many hours, stiffness/ rigidity despite not being on medication)
- For admission
  - Marked agitation / aggression should be managed as an inpatient following the Violence and Aggression treatment guidelines
  - Evidence of dehydration and malnutrition due to prolonged poor self care
  - Evidence that the patient is a risk to themselves (self harm/ neglect/ vulnerable to exploitation) or a risk to others (agitation/ aggression)
  - If insight is lacking and there is no guardian to ensure compliance with medication at home

**Note:** Neuroleptic Malignant Syndrome is a severe but rare complication of anti-psychotics, presenting with fever, rigidity, fluctuating pulse and BP and reduced conscious level. It is a medical emergency. All anti-psychotics should be stopped and the person referred for medical admission.

### *Follow-up*

- If inpatient review the person every 24 hours until stable
- If outpatient review in 1-2 weeks initially and then every 4-8 weeks once more stable
- Screen for ongoing symptoms and monitor for side effects at each review
- Adjust the dose of medication accordingly
- Ask about any drug or alcohol use and give advice about use
- Screen for low mood and suicidal ideation at each review and follow Depression Treatment Guideline if present
- Once symptoms are improving advise the patient to return to their usual daily activities, including work if employed

## 25. Psychiatric Conditions

### Treatment duration:

- First episode: Medication should be continued at an effective dose for one year from when all symptoms are resolved
- Recurrent schizophrenia: Medication should be continued for 2-5 years from complete resolution of symptoms. If many episodes of relapse or symptoms never fully resolves may need to remain on medication lifelong.
- When considering stopping medication, discuss carefully with the patient and guardian and start to reduce slowly over 4-8 weeks
- Advise about symptoms that would indicate relapse (difficulty sleeping, auditory hallucinations, suspicious thoughts) and inform to return to the clinic promptly. Continue to monitor until medication free for 2-3 months before discharging
- Advise them to return to the clinic for review if have any concerns in the future

---

### 25.9.2 Substance Induced Psychosis

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- Development of psychotic symptoms (abnormal behaviour, hallucination and delusions) related to prolonged use of psychoactive drugs (eg cannabis) within the last month

## 25. Psychiatric Conditions

### *Signs and Symptoms*

- Hallucinations (often auditory but can be visual etc) and delusions (fixed false belief) often paranoid/ suspicious in nature
- Speech can be irrelevant and incoherent
- Abnormal behaviour and at times agitation and aggression
- Lack of insight is prominent

### *Investigations*

- Physical causes for the symptoms must be excluded (delirium, drug and alcohol use/ withdrawal. Etc.)
- Full physical examination
- FBC
- VDRL
- Urine drug screen if available
- Consider HIV serotesting

### *Treatment*

- Aim of treatment is to reduce/ remove symptoms and to encourage abstinence from the psycho-active drug
- Treatment duration is shorter (6 months) than for schizophrenia
- Primary treatment
  - Advise to stop using the drug (eg cannabis)
  - In some cases the symptoms will resolve without any further treatment

## 25. Psychiatric Conditions

- A short course of oral **Diazepam** may help with agitation, insomnia while symptoms resolve (**Diazepam** 10mg bd for 1 week)
- Secondary /alternative treatment
  - If symptoms persist despite cessation of substance use, or markedly agitated or aggressive behaviour, an anti-psychotic can be used
  - Give **Chlorpromazine** 100-300mg nocte or **Haloperidol** 2.5-5mg nocte
  - All anti-psychotic medications have a delayed onset of action – advice the patient/ guardian it will take 1-2 weeks before improvement is noted
  - Advice about the side effects:
    - ✓ **Chlorpromazine**: sedation, postural hypotension, constipation, photosensitivity
    - ✓ **Haloperidol**: Extra-pyramidal side effects (EPSE) eg. tremor, stiffness of limbs/jaw, salivation
    - ✓ This dose can be increased at subsequent reviews if symptoms remain present
    - ✓ If EPSEs persist consider reducing the dose of anti-psychotic or adding **Benzhexol** 5mg daily

## 25. Psychiatric Conditions

- Third Line

- If symptoms have not improved on **Chlorpromazine** or if the person has lots of side effects use a second generation anti-psychotic
- Give **Risperidone** 1-2mg nocte
- Advice about side effects:
  - ✓ **Risperidone**: weight gain, sedation, impaired glucose tolerance

OR

- ✓ If compliance with medication is poor despite trying to reduce side effects and counselling on the importance of compliance with medication consider a long-acting depot anti-psychotic
- ✓ Give **Fluphenazine** 12.5mg IM into a large muscle (eg gluteal/ deltoid) as a test dose
- ✓ Caution: risk of Acute Dystonic reaction (painful spasm of head and neck muscles)
- ✓ If occurs give **Benzhexol** po if able to swallow
- ✓ Otherwise IV/IM **Procyclidine** or **Benzhexol** 5mg OR slow IV push **Diazepam** 5-10mg
- ✓ Advise about side effects: EPSE
- ✓ Maintenance dose **Fluphenazine** 25-50mg IM every 4 weeks

## 25. Psychiatric Conditions

- ✓ If EPSE persist consider reducing the dose adding **Benzhexol** 5mg daily

### *Red Flags*

- For referral
  - If symptoms persist/ worsen despite 6-8 weeks of anti-psychotic medication at an effective dose
  - If side effects are not manageable
- For admission
  - Marked agitation / aggression should be managed as an inpatient following the Violence and Aggression treatment guidelines.
  - Evidence that the patient is a risk to themselves (self harm/ neglect/ vulnerable to exploitation) or a risk to others (agitation/ aggression)
  - If insight is lacking and there is no guardian to ensure compliance with medication at home or if compliance is poor at home despite supervision.  
**Note:** Neuroleptic Malignant Syndrome is a severe but rare complication of anti-psychotics, presenting with fever, rigidity, fluctuating pulse and BP and reduced conscious level. It is a medical emergency. All anti-psychotics should be stopped and the person referred for medical admission.



## 25. Psychiatric Conditions

### *Follow-up*

- If inpatient, review the person every 24 hours until stable.
- If outpatient, review in 1-2 weeks initially and then every 4-8 weeks once more stable.
- Screen for ongoing symptoms and monitor for side effects at each review. Adjust the dose of medication accordingly.
- Ask about any other drug or alcohol use and give advise about use.
- Screen for low mood and suicidal ideation at each review and follow Depression Treatment Guideline if present.
- Once symptoms are improving advice the patient to return to their usual daily activities, including work if employed.

### Treatment duration:

- Medication should be continued for 6 months from complete symptom resolution
- When considering stopping medication, discuss carefully with the patient and guardian and start to reduce slowly over 2-4 weeks
- Advise about symptoms that would indicate relapse (difficulty sleeping, auditory hallucination, suspicious thoughts) and inform to return to the clinic promptly
- Continue to monitor until medication free for 4- 6 weeks before discharging
- Advise them to return to the clinic for review if have any concerns in the future

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### 25.9.3 Puerperal Psychosis

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- A psychotic disorder affecting the mother, which can develop within a few hours and up to 4 weeks of childbirth, with peak incidence around 24-28 hours
- It can be particularly florid with marked agitation and aggression due to vivid hallucinations and delusions
- Care must be taken, as there can be significant risk to both mother and baby

#### *Signs and Symptoms*

- Confusion
- Insomnia
- Anxiety
- Agitation
- Possible aggression
- Hallucinations (in any modality) and delusions (particularly paranoid persecutory)

#### *Investigations*

- The puerperium is a time of increased risk of many physical conditions such as sepsis, post-partum haemorrhage, metabolic imbalance, eclampsia etc.
- These conditions can present with delirium and so care must be taken to exclude underlying physical causes

## 25. Psychiatric Conditions

- Full physical examination including vital signs
- FBC U&E LFT
- Blood/ urine glucose
- MRDT
- Consider HIV serotesting

### *General Management*

- The aim of treatment is to reduce/ alleviate symptoms to allow a return to usual functioning and to promote good bonding between mother and baby
- As with all psychotic disorders treatment duration is for at least 1 year
- First assess the risk of the mother to herself and her baby (some may have thoughts of harming their baby due to the psychotic symptoms) and the risk of aggressive behaviour
- If present follow Violence and Aggression Treatment Guideline. Ensure that the baby is in the care of the guardian and that all mother baby interactions are supervised until more stable
- Care should be taken in breastfeeding mothers as medication can be found in the breastmilk. Use low doses and increase slowly. Monitor the baby for evidence of sedation
- Primary treatment
  - Give **Chlorpromazine** 100-200mg nocte or **Haloperidol** 1.25-2.5mg nocte

## 25. Psychiatric Conditions

- All anti-psychotic medication have a delayed onset of action – advise the patient/ guardian it may take 1-2 weeks before significant improvement is noted
- Advise about the side effects:
- **Chlorpromazine**: sedation, postural hypotension, constipation, photosensitivity
- **Haloperidol**: Extra-pyramidal side effects (EPSE) eg. tremor, stiffness of limbs/jaw, salivation
- This dose can be increased at subsequent reviews if symptoms remain present
- If EPSEs persist consider reducing the dose of anti-psychotic or adding **Benzhexol** 5mg daily
- Secondary /alternative treatment
  - If no improvement after 4-6 weeks on adequate dose of **Chlorpromazine/ Haloperidol** or unacceptable side effects persist, consider a second generation anti-psychotic
  - Give **Risperidone** 0.5-1mg nocte
  - Advice about side effects:
    - ✓ **Risperidone**: weight gain, sedation, impaired glucose tolerance

## 25. Psychiatric Conditions

### *Red Flags*

- For referral
  - If symptoms persist or worsen, despite adequate doses of anti-psychotic for 6-8 weeks
  - If there is evidence that the baby is failing to thrive (dehydration, weight loss, inadequate care etc)
- For admission
  - Marked agitation / aggression should be managed as an inpatient following the Violence and Aggression treatment guidelines
  - Evidence that the patient is a risk to themselves (self harm/ neglect/ vulnerable to exploitation) or a risk to others (agitation/ aggression)
  - If there is no guardian to take care of the baby and to ensure compliance with medication at home or if compliance is poor at home despite supervision

### *Follow-up*

- If an inpatient review every 8 hours until the symptoms improve.
- If an outpatient review twice weekly until symptoms improve. Then review every 2-8 weeks.
- Screen for ongoing symptoms and monitor for side effects at each review. Adjust the dose of medication accordingly.

## 25. Psychiatric Conditions

- Ask about any drug or alcohol use and give advise about use.
- Once symptoms are improving advise the patient to return to their usual daily activities, including work if employed
- Treatment duration
  - If first episode: Medication is continued for 1 year from complete resolution of symptoms
  - If previous episodes of psychotic illness (e.g. schizophrenia/ Bipolar affective disorder) continue medication for 2-5 years from complete resolution of symptoms
  - When considering stopping medication, discuss carefully with the patient and guardian and start to reduce slowly over 4-8 weeks
  - Advise about symptoms that would indicate relapse (difficulty sleeping, auditory hallucination, suspicious thoughts) and inform to return to the clinic promptly
  - Continue to monitor until medication free for 2-3 months before discharging
  - Advise them to return to the clinic for review if have any concerns in the future or when pregnant again (high risk of recurrence in future pregnancies)

## **25.10 Mood Disorders**

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- These disorders mainly present with a disturbance of mood, which can either be elevated or depressed, with associated changes in activity levels and behaviour

### **25.10.1 Depression**

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- The person experiences persistent sadness with decreased energy and enjoyment of usual activities, everyday for at least 2 weeks
- If it is moderate to severe there is impairment of the usual occupational and functional activities such as going to work, housework and self care
- Suicidal ideation should be asked about at every assessment

#### Signs and Symptoms

- Low mood or irritability
- Reduced energy and enjoyment
- Poor sleep
- Reduced appetite and weight loss
- Poor concentration
- Feelings of guilt and worthlessness
- Possible suicidal ideation
- Looks sad
- Poor eye contact
- Reduced speech at low volume
- Evidence of weight loss and poor self care
- Possible agitation
- If severely unwell can develop psychotic symptoms (delusions and hallucinations)

## 25. Psychiatric Conditions

### *Investigations*

- Some physical illnesses can present with depressive symptoms (anaemia, hypothyroidism) so these must be excluded and the person assessed for dehydration and malnutrition
- Full physical examination including vital signs.
- FBC ,U&E, glucose
- If evidence of hypothyroidism on examination (weight gain, dry skin, goitre) check TFTs if possible
- VDRL
- Consider testing HIV serostatus
- Urine drug screen if available

### *General Management*

- The aim of management is to completely resolve symptoms, if possible, to allow the person to return to their previous activities and occupation
- Duration of treatment varies from 6 months to 2 years depending on whether it is a first episode of a recurrent illness



## 25. Psychiatric Conditions

- Primary treatment
  - If mild to moderate depression (symptoms of depression present but still managing to undertake most of daily activities), first line treatment should be supportive counselling (listen to and try to understand their problems, help them to think about possible solutions, encourage enjoyable activities)
  - Consider referring to local supportive groups (church, womens groups, etc.)
  - If moderate to severe, or if mild depression persists despite counselling commence anti-depressant treatment
  - Give **Amitriptyline** 50-75mg nocte
  - Increase after 2 weeks by 25mg if symptoms persist up to a maximum of 200mg
  - Monitor for side effects (sedation, hypotension, dry mouth, constipation, sexual dysfunction)
  - Explain that antidepressants have delayed onset of action and it may take 1-2 weeks before improvements are noted
  - If suicidal ideation is present, give medication to the guardian to administer (**Amitriptyline can be fatal in overdose due to cardiac effects**). If no guardian, admit the patient until suicidal ideation is resolved.

## 25. Psychiatric Conditions

- If person is elderly or physically frail (eg HIV) reduce the starting dose to **Amitriptyline** 25mg nocte and increase the dose slowly.
- Secondary /alternative treatment
  - If not improved on an adequate dose of amitriptyline for 4-6 weeks or unable to tolerate due to side effects change to SSRI
  - Give **Fluoxetine** 20mg daily
  - Increase after 2 weeks by 20mg upto a maximum of 60mg daily (rarely needed)
  - Monitor for side effects (agitation, increase in anxiety initially, insomnia, GI upset)
  - If psychotic symptoms (hallucinations or delusions) present, treat with an anti-psychotic and consider referral to district psychiatry team
    - ✓ Give **Chlorpromazine** 75-150mg nocte or **Haloperidol** 1.25-2.5mg nocte
    - ✓ Increase dose every 2 weeks until psychotic symptoms have resolved

### *Red Flags*

- For referral
  - Ongoing or worsening symptoms despite adequate anti-depressant treatment for 2- weeks
  - Depression with psychotic symptoms

## 25. Psychiatric Conditions

- Persistent or increasing suicidal ideation or if the person has developed a suicide plan
- Evidence of self neglect, dehydration or malnutrition
- For admission
  - Evidence that the patient is a risk to themselves (self harm/ neglect/ vulnerable to exploitation) or a risk to others (agitation/ aggression)
  - If presents with severe depression with psychotic symptoms and evidence of psychomotor retardation, this is an emergency and should be referred for admission for consideration of Electro Convulsive Therapy (ECT)
  - If has active plans of suicide or a recent suicidal attempt.
  - If has thoughts of harming others.
  - Evidence of self neglect including not eating and drinking properly.

### *Follow-up*

- If inpatient review daily until more stable, monitoring vital signs if food and fluid intake is poor
- IV fluids may be required
- If outpatient and suicidal ideation or psychotic symptoms present review weekly, until symptoms improved. Thereafter review every 2-4 weeks.
- At each review, ask about symptoms, suicidal ideation and side effects from medication.

## 25. Psychiatric Conditions

- Monitor for emergence of manic symptoms (see below) as some people can develop manic symptoms when treated with anti-depressants.
- Give supportive counselling to patient (see mild –moderate depression above).
- Advise to increase physical activity gradually once improved and to return to usual activities when possible, including work if employed.
- Once stable review every 8 weeks.
- Duration of treatment
  - First episode of depression: continue medication for 6 months from complete resolution of symptoms.
  - Recurrent depressive illness: continue medication for 2 years after complete resolution of symptoms
  - When considering stopping medication, discuss carefully with the patient and guardian and start to reduce slowly over 4-8 weeks. Advise about symptoms that would indicate relapse (difficulty sleeping, low mood, reduced energy, increase worries) and inform to return to the clinic promptly. Continue to monitor until medication free for 1-2 months before discharging

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### 25.10.1.1 Post Partum Depression

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within 6 months of childbirth.

- Assess risk: of self harm, of harm from mother to baby and of neglect of the baby.
- If any concerns admit or refer for review.

### Treatment

- Caution should be used when prescribing medication to pregnant and breast-feeding women.
- If mild to moderate depression, treat with supportive counseling.
- If medication is required:
  - Give **Amitriptyline**: start at 25-50mg nocte and increase slowly. Avoid during first trimester of pregnancy. In breastfeeding mothers it is the treatment of choice. Monitor the baby for evidence of sedation as small amounts can be found in the breast milk.
  - Give **Fluoxetine**: Generally safe in pregnancy. Avoid in breastfeeding mothers.
  - Otherwise follow Depression Treatment Guidelines as above.

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#### 25.11 Mania

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- Mania presents with elevated or irritable mood with associated increase in energy and activity and possible aggression and psychotic symptoms present for at least a week or resulting in complete disruption of usual functioning.

## 25. Psychiatric Conditions

### *Signs and Symptoms*

- Elevated or irritable mood
- Reduced need for sleep
- Increased energy and activity
- Talkativeness
- Over spending
- Increased libido
- Agitation and over activity
- Possible aggression
- Rapid speech
- Reduced attention and concentration
- Possible psychotic symptoms (hallucinations and delusions which are grandiose in nature – belief that special/important/ very rich person etc)

### *Investigations*

- Full physical examination to exclude underlying organic causes (delirium)
- Vital signs: If severely unwell, dehydration/ exhaustion can be potentially fatal
- FBC, U&E, glucose
- If evidence of hyperthyroidism on examination (weight loss, tremor, exophthalmos, goitre) consider TFTs if available
- VDRL
- Consider HIV serotesting (HIV can present with secondary mania)

*General Management*

- The aim of management is to reduce/ alleviate symptoms, to allow the person to return to their previous daily activities and occupation if employed and to prevent any further relapses in the future. It is continued for at least 2 years.
- If marked agitation / aggression follow the Violence and Aggression Treatment Guideline.
- Always assess risk – of suicide, harm to others and of self neglect
- Primary treatment
  - Commence either a mood stabiliser or an anti-psychotic
  - Give **Sodium Valproate** 400mg nocte increasing every few days by 200mg until symptoms improved. Usual effective dose 600- 1000mg.
  - Caution: **Sodium Valproate should be avoided in women of child-bearing age due to teratogenic effects.** If no available alternative advise about contraception.
  - Side effects: sedation, weight gain, liver impairment
  - Give **Carbamazepine** 200mg nocte increasing by 200mg every few days until on 400-600mg. Usual dose 400-600mg daily.

## 25. Psychiatric Conditions

- Caution: **Carbamazepine** should be avoided in women of childbearing age due to teratogenic effects. If no available alternative advise about contraception.
- Side effects: sedation, rash, incoordination, RARELY Steven Johnsons syndrome
- If psychotic symptoms present also give an anti-psychotic medication
- Give **Chlorpromazine** 100-200mg nocte or haloperidol 2.5mg nocte
- Alternative treatment
  - Give **Chlorpromazine** 100-200mg nocte increasing every week by 100mg until symptoms improve. Usual dose 100 – 500mg daily
  - Side effects: sedation, postural hypotension, constipation, photo-sensitivity
  - Give **Haloperidol** 2.5mg nocte increasing by 1.25mg every week until symptoms resolves. Usual dose 1.25-5mg daily

### *Red Flags*

- For referral
  - Ongoing or worsening symptoms despite adequate treatment for 2-4 weeks



## 25. Psychiatric Conditions

- For Admission
  - Evidence of exhaustion, dehydration due to over-activity. IV fluid may be necessary
  - Evidence that the patient is a risk to themselves (self harm/ neglect/ vulnerable to exploitation) or a risk to others (agitation/ aggression)
  - No guardian available to monitor adherence to medication

### *Follow-up*

- If inpatient review every 24 hours until stable.
- If outpatient and suicidal ideation/ psychotic symptoms present review twice a week until more stable.
- Otherwise review every 1-2 weeks until symptoms improve.
- Once stable review every 4-8 weeks.
- At every review, ask about symptoms, suicidal ideation and medication adherence and side effects.
- Provide education about illness to patient and guardians. Give supportive counselling and encourage return to previous activities and occupation as soon as able.
- Duration of treatment
  - First episode treatment should be continued for 2 years from complete resolution of symptoms.

## 25. Psychiatric Conditions

- Multiple episodes: treatment should be for at least 5 years from complete resolution of symptoms and some may need lifelong medication.
- When considering stopping medication, discuss carefully with the patient and guardian. There is significantly increased risk of relapse if medication is stopped suddenly. Start to reduce slowly over 2-3 months. Advise about symptoms that would indicate relapse (difficulty sleeping, low/elevated mood, reduced or increased energy, increased worries) and inform to return to the clinic promptly. Continue to monitor until medication free for 1-2 months before discharging

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**MALAWI ESSENTIAL  
MEDICINES LIST  
(MEML) 2015**



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## Introduction

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The MEML lists all those medicines considered to be most suitable for current use in the country. Although primarily intended for public sector application, it is equally appropriate for private sector prescribers, who are strongly encouraged to select medicines on the MEML whenever possible.

### 1. Categorisation of medicines

- medicines items have again been categorised using a three letter coding system according to the:
  - approved level of use (H,D or C)
  - therapeutic priority (V or E)
  - procurement system (A or B)
- Details of this are given in the Presentation of Information section. Such categorisation is intended to facilitate the prioritisation of selection and subsequent procurement of drugs both by Central Medical Stores Trust (CMST) and user units.

### 2. Procedure for amendments of the MEML

- Prescribers are encouraged to continually and critically review the relevance of the MEML to current clinical practice.
- Suggestions for amendments should be made through submission of a proposal in writing to:

*HTSS-Pharmaceuticals*  
*PO Box 30377, Lilongwe 3, Malawi*  
*Tel: (265) 01 788 371*  
*Fax: (265) 01 788 502*
- An amendment form which may be used for this purpose has been included at the end of this booklet.
- Amendments can include the addition or deletion of an item, change of dose presentation, change of categorisation code (s), change of layout of the publication, etc.)
- When sufficient proposals have been received or if urgent amendments are required, a special NMC will be convened to review these and agree on any changes to the MEML.
- Otherwise it is planned for the MEML to be revised once every 3 years in conjunction with the MSTG.
- 

### 3. For adverse reactions:

Please contact the Pharmacy, Medicines and Poisons Board at [info@pmb.mw](mailto:info@pmb.mw)



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## Presentation of Information

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### 1. General

- 1.1 **Medicines names:** as in previous lists, each medicines item is described by its *generic name* which, according to the National Medicine Policy (NMP) 2014, should be used for all prescribing and dispensing.
- 1.2 **Order of Sections:** Medicines are arranged by pharmacological/therapeutic groups following the same basic format as the “WHO Model List of Essential Drugs (Eighteenth List)” April 2013, with the addition of an extra section (Number 31; Nutritional Disorders)
- 1.3 **Medicines numbering:** each item is numbered within its section and thus can be conveniently identified by a composite number, consisting of the section number and the medicines numbers (final number):

### 2. Categorisation/Prioritisation of medicines items

Each MEML item is categorised by the following three code letter system:

#### 2.1 Level of use code (H, D, or C)

This indicates the level of Health Institution at which the item would normally be permitted for use:

**H = Health Centre level** (i.e. for use throughout the health system at Health Centre, District Hospital and Central Hospital levels).

**D = District Hospital level** (i.e. for use at District Hospital and Central Hospital levels only)

#### **C = Central Hospital level** (i.e. for use at Central Hospital level only)

Thus C drugs should not normally be used at D and H levels, and D drugs should not normally be used at H level.

However, there are **possible exceptions** to this general rule:

- (a) Additional clinical expertise:** if this is available at H level (e.g. An Ophthalmic Medical Assistant, Psychiatric Enrolled Nurse/Midwife, Clinical officer, etc), certain D level drugs may be made available for use by that particular prescriber.

This however will be at the discretion of the District Health Officer (DHO). Written authorisation should be given to the named prescriber by the DHO, listing the drugs authorised and a copy of this sent to the Chief of Health Services (CHS).

**Note:** Such D level drugs will be ordered from the district hospital and will not be part of the LMIS report the health centre sends to the DHO and therefore will not be delivered directly to the health centre by Regional Medical Stores.

**(b) Special clinical expertise:** certain DHOs may have access to specialised clinical expertise in one or more areas and must request their Regional Medical Stores to make available certain C level drugs for use at the particular district hospital.

Authorisation stating name of prescriber, specified drugs etc should be sought in writing from the Chief Executive Officer of CMST.

**(c) Maintenance treatment:** individual patients being treated for chronic conditions may have arrangements made for them to receive maintenance treatment with the required D or C level drugs at H level.

In these cases, such arrangements should be authorised by the DHO and formalised in writing (named patient specified drug/s and duration of treatment) with a copy retained at the district.

## 2.2 Therapeutic priority code (V or E)

This code identifies the therapeutic importance of each item using the VEN system as follows:

(a) **V (Vital) drugs** which:

- are potentially life-saving
- have significant withdrawal side-effects making regular supply mandatory
- are of major public health importance (e.g. needed by many patients for treatment of serious, contagious diseases, needed to control epidemics, etc)

(b) **E (Essential) drugs** which:

- are effective against less severe, but nevertheless significant forms of illness

(c) The **VEN** system also has a third category of N (Non-essential) drugs which are:

- used for minor or self-limiting illnesses
- of questionable efficacy
- have a high cost for a marginal therapeutic advantage

Items in this category were not included in the MEML due to economic constraints that affect the drug supply system and the subsequent need to carefully prioritise/rationalise drug selection and procurement.

## 2.3 Procurement system code (A or B)

This third code specifies how items will be procured by CMST and by the user units.

(a) **A – List items:**

- Are generally required for large numbers of patients
- Will be routinely procured and stocked by CMST
- Include all H level drugs

**Note:** Where funds for procurement are insufficient, first priority will be given to the procurement and supply of (Vital) A-list items (see 2.2 above) i.e. those of the highest therapeutic importance.

If funds remain after securing such VA items, procurement of (Essential) A – list items will then be initiated.

Thus ensuring the availability of A-list items is primarily the responsibility of CMST.

**(b) B – List items:**

- are generally required for limited number of patients
- will **not** be routinely procured and stocked by CMST
- estimates of annual requirements for these will have to be made well in advance by the hospitals and submitted to CMST through the Pharmaceutical section of the HTSS, according to a pre-agreed time schedule.
- payment for these must also be made in advance prior to procurement by CMST and subsequent supply to the hospitals.

Thus procurement of B-list items is primarily the responsibility of the user units.

Each user unit must carefully consider the total annual budget allocated for medicines and medical supplies and make appropriate allocations for other categories.

It should be clearly understood that the ultimate decision as to which items to select/procure lies with the user units.

The categorisation of items by the NMC by therapeutic priority (see 2.2 above) should facilitate this selection process and is intended to help ensure the continuous availability of the most important (ie. VA) items.

**3. Emergency orders**

- Because of the limited numbers of patients involved, some potentially life-saving MEDICINES on the MEMLL are categorised as **VB** items.
- Following established procurement priorities, CMST will not therefore routinely stock these (B-list) items. Ideally user units should keep small *contingency stocks* of such items to cover emergencies. However, if necessary, **special emergency orders** can be placed (initially by phone or fax and then followed up by a written requisition with CMST for identified life saving VB drugs.
- These orders, which must be authorised by the DHO and countersigned by the Regional Medical Stores Pharmacist-in-charge, will not require advance payment, as with other B-list drugs. User units will be promptly notified if CMST is unable to procure and deliver these items within 24 hours.

#### **4. Listing by category/priority within sections**

In order to make the MEML easier to use by different levels of health institution, drugs are listed by generic name within individual sections and subsections according to the following order of priority.

1. H level then D level then C level.
2. Within each level the listing is V (vital) then E (essential) drugs which are on the A list for procurement (i.e. always stocked by CMST) followed by V (vital) then E (essential) drugs which are on the B list for procurement (i.e. only stocked if ordered/paid for in advance)

## 5. Abbreviations

amp	=	ampoule
aq	=	aqueous
cap	=	capsule
CHSU	=	Community Health Sciences Unit, Lilongwe
CMST	=	Central Medical Stores Trust
COM	=	College of Medicine
EO	=	emulsifying ointment
g	=	gram
inj	=	injection
IU	=	international units
i/m	=	intramuscular
i/v	=	intravenous
L	=	litre
KCH	=	kamuzu Central Hospital
mg	=	milligram
mixt	=	mixture
mL	=	millilitre
MOH	=	Ministry of Health
MU	=	mega (million) units
oint	=	ointment
paed	=	paediatric
PFR	=	powder for reconstitution
PIH	=	pregnancy – induced hypertension
PMPB	=	Pharmacy, Medicines and Poisons Board,
QECH	=	Queen Elizabeth Central Hospital,
RMS	=	Regional Medical Stores
s/c	=	subcutaneous or sugar-coated as appropriate
soln	=	solution
susp	=	suspension
tab	=	tablet
vag	=	vaginal
YSP	=	yellow soft paraffin
%v/v	=	percentage volume in volume
ZCH	=	Zomba Central Hospital
ZMH	=	Zomba Mental Hospital
mcg	=	microgram

<b>1. Anaesthetics</b>			
<b>1.1 General anaesthetics and oxygen</b>			
<b>1.1.1 Inhalation Medicines</b>			
1.2			
1	Halothane	inhalation	DVA
2	Isoflurane	inhalation	CVA
3	Nitrous oxide	medical gas	CEB
4	Oxygen	inhalation (medicinal gas)	DVA
<b>1.1.2. Injectable Medicines</b>			
2	Atracurium	inj, 10mg/mL, 5mL amp	CEB
3	Fentanyl	inj, 50mcg/mL, 10mL	CEB
4	Ketamine HCl	inj, 50 mg/mL, 10 mL amp	DVA
5	Morphine sulphate	inj, 2mg/mL, 50mL vial	CVA
6	Neostigmine	inj, 2.5mg/mL, 1mL amp	DVA
7	Pethidine	inj, 50mg/mL, 2mL amp	DVA
8	Propofol	inj, 2%, 50mL vial	CVA
9	Suxamethonium	inj, 50mg/mL, 2mL amp	DVA
10	Thiopentone sodium	inj, 0.5 g vial PFR	DVA
11	Vecuronium	inj, 10mg vial, PFR	DVA
<b>1.2 Local anaesthetics</b>			
1	Lignocaine HCl	inj, 1%, 25 ml vial	HEA
2	Lignocaine HCl	dental cartridges,	HEA
	+ adrenaline	2% + 1/80,000, 2.2 mL	
3	Lignocaine HCl	inj, heavy spinal,	CVB
	+ glucose	5% + 7.5%	
4	Lignocaine HCl	gel, 2%, 30 g tube	DEA
5	Lignocaine HCl	inj, 2%, 20 mL vial	CVB
6	Lignocaine HCl	spray, 10%	CEB
7	Bupivacaine (heavy)	inj, 5mg+80mg/mL, 4mL amp	DVA
	+glucose		
8	Bupivacaine( plain)	inj, 2.5mg/mL, 10mL amp	DVA
9	Ropivacaine	Inj, 7.5mg/mL, 10mL amp	CEB

### 1.3 Preoperative medication and sedation for short-term procedures

1	Amiodarone	inj, 30mg/mL, 10mL	CVA
2	Atropine sulphate	inj, 600 mcg/mL, 1mL amp	DVA
3	Diazepam	inj, 5 mg/mL, 1 mL amp	DVA
4	Diazepam	tab, 5 mg	DEA
5	Dobutamine	inj, 12.5mg/mL, 20mL amp	CVA
6	Ephedrine	inj, 30mg/mL, 1mL amp	DVA
7	Epinephrine	inj, 100mcg/mL, 10 mL amp	DVA
8	Lorazepam	inj, 4mg/mL	CEB
9	Metoclopramide	inj, 5mg/mL, 2mL amp	CEB
10	Midazolam	inj, 1mg/mL, 2mL amp	CEB
11	Morphine sulphate	inj, 15 mg/mL, 1 mL amp	DVA
12	Morphine sulphate	tab, slow-release, 10 mg	DVB
13	Nitro glycerine	tab, 0.3mg	CVA
14	Pethidine HCl	inj, 50 mg.mL, 2 mL amp	DVA
15	Phenylephrine	inj, 10mg/mL, 1mL amp	CEB
16	Promethazine	tab, 25 mg	DEA
17	Promethazine HCl	elixir, 5 mg/5 mL	DEA
18	Promethazine HCl	inj, 25 mg/mL, 2 mL amp	DEA
19	Sodium citrate	soln, oral, 300mmol/L	DVA

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## 2. Medicines for Pain and Palliative Care

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### 2.1 Non-opioids and non-steroidal anti-inflammatory medicines (NSAIMs)

1	Aspirin	tab, 300 mg	HVA
2*	Diclofenac sodium	tab, 50 mg	DEA
3*	Ibuprofen	tab, 200 mg	DEA
4	Indomethacin	tab, 25 mg	HEA
5	Mefenamic acid	cap, 250mg	DVA
6	Paracetamol	elixir 125mg/ml	HVA
7	Paracetamol	tab, 500 mg	HVA
8	Tranexamic acid	tab, 500mg	DEB

### 2.2 Opioid analgesics

1	Codeine phosphate	tab, 15 mg	DVA
2	Dihydrocodeine tartrate	tab, 30 mg	DEA
3	Morphine sulphate	strong soln, 10mg/ml	DVA
4	Morphine sulphate	weak soln, 5mg/5ml	DVA
5	Morphine sulphate	inj, 15 mg/mL, 1 mL amp	DVA
6	Morphine sulphate	tab, slow-release, 10 mg	DVB
7	Naloxone HCl	inj, neonatal,	DEA
8	20 mcg/mL, 2 mL amp		
9	Pethidine HCl	inj, 50 mg/mL, 2 mL amp	DVA
10	Tramadol	cap, 50mg	DEB

### 2.3 Medicines for other common symptoms for palliative care

1	Amitryptiline	tab, 25mg	HVA
2	Baclofen	tab, 5mg	DEB
3	Bisacodyl	tab, 5mg	DEA
4	Bupivacaine	inj, 1mg/ml ampoule	CVA
5	Carbamazepine	liquid, 100mg/5ml	HVA
6	Chlopromazine	tab, 25mg	HVA
7	Dexamethasone	inj, 4mg/ml,1 ml ampoule	DEB
8	Dexamethasone	tab, 0.5mg	DEB
9	Diazepam	inj, 5mg/ml	DVA
10	Diazepam	tab, 5mg	DVA
11	Haloperidol	tab, 0.5mg	DEA
12	Hyoscine Hydrobromide	inj, 400mcg/ml	CEB



13	Lactulose	liquid, 3.1-3.7g/5ml	CVB
14	Metoclopramide	tab, 10mg	DEB
15	Phenytoin	tab, 100mg	HVA
16	Prednisolone	tab, 5mg	DVA
17	Senna	liquid, 7.5mg/5ml	DVB
18	Gabapentine	cap, 100mg	DVA
19	Gabapentine	tab, 600mg	DVA

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**3. Antiallergics and medicines used in Anaphylaxis**

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**3.1 Antihistamines**

1	Betamethasone	tab 0.5mg	DEB
2	Cetirizine	tab, 10mg	DEB
3	Chlorpheniramine maleate	tab, 4 mg	HEA
4	Chlorpheniramine maleate	inj, 10mg/ml, amp	DVA
5	Promethazine	tab, 25 mg	HVA
6	Promethazine HCl	elixir, 5 mg/5 mL	DEA
7	Promethazine HCl	inj, 25 mg/mL, 2 mL amp	DEA

**3.2 Medicines used in nasal allergy**

1	Beclomethasone dipropionate	nasal spray, 50mcg/spray	DEB
2	Oxymetazoline hydrochloride	nasal drops 0.1%, spray 0.1%	DEB

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**4. Antidotes and other medicines used in poisoning**

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**4.1 Non specific**

1	Activated charcoal	powder	DVB
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**4.2 Specific**

1	Atropine sulphate	inj, 600 mcg/mL, 1 ML amp	DVA
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2*	Acetylcysteine	inj, 200 mg/mL, 10 mL amp	DVB
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3	Darrows Half strength	infusion, 1L with 5% glucose	CVB
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4	Desferrioxamine	inj, 500 mg vial (PFR)	DVB
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5	Dextrose	infusion, 5% 1L	HVA
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6	Ipecacuanha	emetic mixture, paediatric	HEA
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8	Pralidoxime mesylate	inj, 200 mg/mL, 5 mL amp	CVB
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9	Sodium Bicarbonate	tab, 600mg	CVB
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10	Sodium Chloride	infusion, 0.9%, 1L	HVA
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<b>5. Anticonvulsants/Antiepiletics</b>			
1	Carbamazepine	tab, 200 mg	DEB
2	Diazepam	inj, 5 mg/mL, 2 mL amp	DVA
3	Ethosuximide	cap, 250 mg	CEB
4*	Magnesium sulphate	inj, 500 mg/m, 2 mL amp	DVA
5	Paraldehyde	inj, 10 mL amp	HVA
6	Phenobarbitone sodium	tab, 30 mg	HVA
7	Phenobarbitone sodium	inj, 200 mg/mL, 1 mL amp	HVA
8	Pheytoin sodium	tab, 100 mg	DVA
9	Phenytoin sodium	inj, 50mg/ml, amp	DVA
10	Sodium valproate	tab, 200 mg	CVB

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**6. Anti-infective medicines**

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**6.1 Anthelmintics****6.1.1 Intestinal anthelmintics**

1	Albendazole	tab, 200 mg	HEA
2	Mebendazole	tab, 500mg	HEA
3	Niclosamide	tab, chewable, 500 mg	DEB

**6.1.2. Antifilarials**

1	Ivermectin	tab, 6 mg	HVB
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**6.1.3 Antischistosomes and other antitrematode medicines**

1	Praziquantel	tab, 600 mg	H
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**6.2 Antibacterials****6.2.1. Penicillins and cephalosporins (Beta Lactam medicines)**

1	Amoxicillin	cap, 250 mg	HVA
2	Amoxicillin	elixir, 125 mg/5 mL	HVA
3	Amoxicillin dispersible	tab, 250mg	HVA
4	Amoxicillin + clavulanic acid	tab, 500 + 125mg	CEA
5	Ampicillin sodium	inj, 250 mg vial PFR	DVA
6	Benzathine/ Benzylpenicillin	inj, 1.44 g vial PFR (=2.4 MU)	HVA
7	Benzylpenicillin	inj, 4 g vial PFR (=5 MU)	HVA
8	Cefotaxime	inj, 500 mg PFR	DVA
9	Ceftazidime	inj, 1g vial, PFR	CVB
10	Ceftriaxone	inj, 1g PFR	DVA
11	Cephalexin	cap, 250 mg	DVA
12	Cloxacillin	cap, 250mg	DEA
13	Flucloxacillin	capsule, 250 mg	DVA
14	Flucloxacillin	elixir, 125 mg/5 mL	DVA
15	Flucloxacillin	inj, 250 mg vial PFR	DVA
16	Imipenem	inj 500mg vial PFR	CVA
17	Imipenem+ Cilastatin	inj, 250mg+250mg PFR	CVA
18	Meropenem	inj 500mg vial PFR	CVA
19	Piperacillin + Tazobactam	inj, 4g + 500mg vial PFR	CEB
20	Procaine penicillin	inj, 4.8 MU vial	CVB

**6.2.2 Other antibacterials**

1	Azithromycin	cap, 250mg	DEA
2	Azithromycin	susp, 200mg/5 mL	DEA
3	Chloramphenicol sodium Succinate	inj, 1 g vial PFR	HVA
4	Co-trimoxazole	tab, 480 mg	HVA
5	Clarithromycin	tab, 500mg	CVA
6	Clarithromycin	susp, 125mg/5ml	DVA
7	Ciprofloxacin	tab, 250 mg	DVB
8	Clindamycin	cap, 150mg	DEB
9	Doxycycline	tab, 100 mg	HVA
10	Erythromycin	tab, e/c, 250 mg base	HVA
11	Erythromycin ethyl succinate	susp, 125 mg/5 mL (of erythromycin base)	DVA
12	Gentamicin	inj, 40 mg  (as sulphate) mL, 2 mL vial	HVA
13	Gentamicin	paed inj, 10 mg (as sulphate)/mL, 2 mL vial	DEA
14	Metronidazole	tab, 200 mg	HVA
15	Metronidazole	inj, 5 mg/mL, 100 mL vial  (lv infusion)	DVA
16*	Metronidazole	susp, 200 mg/5 mL	DVA
17	Nalidixic Acid	tab, 500 mg	DVA
18	Neomycin	tab, 500mg	DEB
19	Nitrofurantoin	tab, 50 mg	DEA
20*	Nitrofurantoin	susp, 25 mg/5 mL	DVB
21	Sodium fusidate	tab, 250 mg	CVB
22	(Sulphamethoxazole + Trimethoprim)	(400 mg + 80 mg),960mg	DVA
23	Vancomycin	inj, 1g vial PFR,	CVA
24	Vancomycin	cap, 250mg	DVB

### 6.2.3 Antileprosy medicines

#### 6.2.3 Antileprosy medicines

1	Clofazimine	cap, 50 mg	DVA
2	Dapsone	tab, 100 mg	DVB
3	Rifampicin	caps, 150 mg	DVB

#### 6.2.4 Antituberculosis medicines

1	Amikacin	inj 1g vial PFR	CVA
2	Capreomycin(Cm)	inj 1g, vial PFR	CVA
3	Cycloserine	tab 250mg	CVB
4	Ethambutol HCl	tab, 400 mg	DVA
5	Ethionamide	tab 250mg	CVA
6	Isoniazid (H) + ethambutol (E)	tab, 150 mg + 400 mg	DVA
7	Isoniazid (INH)	tab, 100 mg	DVA
8	Kanamycin (Km)	inj 1g vial PFR	CVA
9	Levofloxacin (Lfx)	tab, 250mg	CVA
10	Moxifloxacin (Mfx)	tab, 400mg	CVA
11	Pyrazinamide (Z)	tab, 400 mg	DVA
12	Pyrazinamide (Z)Ethambutol (E)	400mg+275mg	DVA
13	RHZE	tab,150mg+75mg+400mg+275mg,	DVA
14	Rifampicin (R) + isoniazid (H)	tab, 100 mg + 50 mg	DVA
15	rifampicin+isoniazid RH,	tab, 150mg+75mg	DVA
16	Streptomycin sulphate	inj 5 g vial PFR	DVA

#### Paediatric

17	RHZ + E100	tab, 60mg+30mg+150mg,	DVA
18	RH	tab, 60mg+60mg	DVA

### 6.3 Antifungalmedicines

1	Amphotericin B	inj, 50mg vial PFR	CVA
2	Clotrimazole	vagl tablets , 100mg	DEA
3	Fluconazole	cap, 250 mg	DVA
4	Fluconazole	i/v infusion, 2 mg/mL, 25mL	DVA
5	Fluconazole	oral liquid, 50mg/ml	DVA
6	Gentian violet	paint, aq, 0.5%, 500 mL	HEA

7	Griseofulvin	tab, 125 mg	DEA
8	Nystatin	pessary, 100,000 units <sup>1</sup> (with applicator)	HVA
9	Ketoconazole	tab, 200 mg	DVA
10*	Ketoconazole	susp, 100 mg/5 mL	DVA
11	Miconazole Nitrate	vag tablet, 200mg	CVA

#### 6.4 Antiviral medicines

##### 6.4.1 Antiherpes medicines

1	Acyclovir	tab, 200mg	HVA
2	Acyclovir	cream, 5%, 10g	HVA
3	Ganciclovir	inj, 500mg PFR vial	CEB
4	Ganciclovir	tab, 500mg	CEB

##### 6.4.2 Antiretrovirals

###### 6.4.2.1 Nucleoside/Nucleotide reverse transcriptase inhibitors

1	Abacavir (ABC)	tab, 300mg	DVA
2	Didanosine (ddl)	tab, chewable, 50mg	DVA
3	Lamivudine (3TC)	tab, 150mg	DVA
4	Tenofovir (TDF)	tab, 300mg	DVA
5	Zidovudine(AZT)	tab, 300mg	HVA
6	Zidovudine (AZT)	syrup, 50mg/5ml	HVA

###### 6.4.2.2 Non nucleoside/Nucleotide reverse transcriptase inhibitors

1	Efavirenz (EFV)	tab, 600mg	HVA
2	Nevirapine (NVP)	tab, 200mg	HVA
3	Nevirapine	susp, 50mg/5ml	HVA

<sup>1</sup> May be used for oral thrush (pessary is sucked)



#### 6.4.2.3 Protease inhibitors

1	Lopinavir + Ritonavir (LPV/r)	tab 200mg +50mg	DVA
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#### 6.4.2.4 Fixed dose combinations

1	Stavudine (d4T) + Lamivudine (3TC) + Nevirapine (NVP)	tab, 30mg +150mg+200mg	HVA
2	Stavudine (d4T) + Lamivudine (3TC) + Nevirapine (NVP)	tab, 300mg +150mg+200mg	HVA
3	Zidovudine (AZT) + Lamivudine(3TC) HVA+Nevirapine (NVP)	tab, 300mg +150mg+200mg	
4	Zidovudine(AZT) + Lamivudine(3TC)	tab, 300mg +150mg	HVA
	Stavudine(d4T)+Lamivudine(3TC)	tab, 30mg+150mg	HVA
5	Stavudine(d4T)+Lamivudine(3TC)	tab, 6mg+30mg	HVA
7	TenofovirDisoproxilFumarate+		HVA
	Lamivudine+Efavirenz(TDF+3TC +EFV)	tab, 300mg+300mg+600mg	
8	TenofovirDisoproxilFumarate+Lamivudine(TDF/3TC )	tab, 300mg+300mg	HVA
9	Atazanavir /Ritonavir (ATV/r)	tab, 300mg +100mg	HVA

#### 6.4.2.5 Paediatric Anti-HIV medicines

1	Abacavir/Lamivudine (ABC/3TC)	tab, 600+300mg	HVA
2	Abacavir/Lamivudine (ABC/3TC)	tab, 60+30mg	HVA
3	Efavirenz (EFV)	tab, 200mg	DVA
4	Lopinavir/Ritonavir (LPV/r )	susp, 80/20mg, 60 ml	DVA
5	Lopinavir/Ritonavir(LPV/r )	tab, 100+25mg	HVA
6	Nevirapine	susp,10mg/ml, w/syringe,25ml	HVA
7	Nevirapine	susp,10mg/ml,w/syringe, 100ml	HVA
8	Nevirapine (NVP)	tab, 50mg	HVA

9	Nevirapine (AZT+3TC+NVP)		
10	Zidovudine+Lamivudine+	tab, 60+30+50mg	HVA
11	Zidovudine+Lamivudine (AZT+3TC)	tab, 60+30mg	HVA

## 6.5 Antiprotozoalmedicines

### 6.5.1 Antiamoebics and anti giardiasis medicines

1.	Metronidazole	tab, 200 mg	HVA
2*	Metronidazole	susp, 200 mg/5	DVA
3	Praziquantel	tabl, 600 mg	HEA

### 6.5.2 Antileishmaniasis medicines

1	Amphotericin B	inj, 50mg/vial	CEB
2	Fluconazole	tab, 200mg	DVA

### 6.5.2 Antimalarials

#### 6.5.3.1 For curative treatment

1	Artemether+ Lumefantrine	tab, 20mg + 120mg	HVA
2	Artesunate + Amodiaquine	tab, 25mg + 67.5mg	DVA
3	Artesunate + Amodiaquine	tab, 50mg + 135mg	DVA
4	Artesunate + Amodiaquine	tab, 100mg + 270mg	DVA
5	Artesunate Bicarbonate	inj, 60mg vial	CVB
6	Artesunate Rectal	Suppository, 50mg	HVA
7	Artesunate Rectal	Suppository, 100mg	HVA
8	Artesunate Rectal	Suppository, 400mg	HVA
9	Halofantrine	susp, 100 mg/5 mL	CVB
10	Quinine dihydrochloride	inj, 300 mg/mL, 2 mL amp	HVA
11	Quinine sulphate	tab, 300 mg	DVA

### 6.5.3.2 For prophylaxis

1	Sulphadoxine + Pyrimethamine (SP)	tab, 25 mg + 500 mg	HVA
2	Proguanil HCl	tab, 100 mg	DVA
3	Mefloquine hydrochloride	tab, 250mg	CEB

### 6.5.4 Antipneumocytosis and Anti-toxoplasmosis medicines

1	Co-trimoxazole	tab, 480 mg	HVA
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### 6.5.5 Antitrypanosomal medicines (African)

1	Melarsoprol B	inj, 3.6% solution, 5 mL amp	DVB
2	Suramin sodium	inj, 1 g vial PFR	DVB

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**7. Anti-migraine medicines**

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**7.1 For treatment of acute attack**

1	Paracetamol	tab, 500 mg	HVA
2	Ibuprofen	tab, 200 mg	DVA
3	Morphine Sulphate	tab, 10 mg (slow release)	DVA

**7.2 For prophylaxis**

1	Amitriptyline	tab, 25 mg	DVA
2	Carbamazepine	tab, 200 mg	DVA
3	Propranolol HCl	tab, 40 mg	DVA

<b>8. Antineoplastic and immunosuppressant medicines</b>			
<b>8.1 Immunosuppressive medicines</b>			
1	Azathioprine	inj 50mg vial PFR, tab 50mg ,	CVB
2	Cyclosporincap, 25mg		CVA
3	Cyclosporincap, 100mg		CVA
4	Prednisolonetab, 5mg		DVA
<b>8.2 Cytotoxic and adjuvant medicines</b>			
1	Actinomycin D PFR (with mannitol)	inj, 500 microgram vial	CVB
2	Adriamycin (doxorubicin)	inj 50mg vial PFR	CVA
3	Bleomycininj	15 IU vial PFR	CVA
4	Busulphan	tab, 2 mg	CVB
5	Carboplatin	inj, 50 mg/5 ml; 5MI	CVB
6	Chlorambucil	tab, 2 mg	CVB
7	Cisplatin	inj 50mg/50ml,50ml bottle	CVB
8	Cyclophosphamide	tab, 50 mg	CVA
9	Cyclophosphamide	inj, 200 mg vial PFR	CVA
10	Cyclosporin	cap, 100mg	CVB
11	Cytarabine	inj, 100mg/mL, 5mL	CVB
12	Darcabazine	inj, 100mg/mL, PFR, 200mg vial	CVB
13	Etoposide	inj, 20 mg/ml, 5-ml amp	CVB
14	Fluorouracil	inj 500mg/10ml,10ml amp	CVB
15	Hydroxyureatab,500mg		CVB
16	Ifosphamide	inj, 1 g vial, PFR.	CVB
17	Leucovorin	inj, 10mg/mL 5mL vial	CVA
18	Melphalan	tab, 2 mg	CVB
19	Methotrexate	inj, 2.5. mg/mL, 1 mL amp	CVA
20	Methotrexate	tab, 2.5 mg	CVA
21	Paclitaxel	inj 300mg/50ml, vial	CVB
22	Procarbazine	cap, 50mg	CVB
23	Taxotere (Docetaxel)	inj, 40mg/ml, 2ml vial	CVB
24	Vinblastine	inj, 1mg/mL, PFR, 10mL vial	CVB
25	Vincristine sulphate	inj, 1 mg vial PFR	DVA
<b>8.3 Hormones and antihormones</b>			
1	Anastrozole	tab1mg	CVB
2	Bicalutamide	tab,50mg	CVB
3	Fludrocortisone	tab, 100mcg	CVB
4	Tamoxifen	tab, 40mg	CVB
5	Tamoxifen	susp, 10mg/5ml	CVB

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<b>9</b>	<b>Antiparkinsonism medicines</b>		
1	Benzhexol HCl	tab, 5 mg	DEA
2	Bromocriptine	tab, 2.5. mg	CEB
3	Biperiden	tab 2mg	CEB
4	Levodopa + carbidopa	tab, 250 mg + 25 mg	CEB
5	Orphenadrinetab 50mg,		CEB

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**10 Medicines affecting the blood**

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**10.1 Antianaemic medicines**

1	Ferrous sulphate + Folic acid	tab, 200 mg + 0.5 mg	HVA
2	Ferrous sulphate	mixt, paediatric, 60 mg/5 mL	HEA
3	Folic acid	tab, 5 mg	HVA
4	Hydroxocobalamin	inj, 1 mg/mL, 1 mLamp	CVB
5	Iron sorbitol	inj, 5% (50 mg/mL) 2 mLamp	DVB

**10.2 Medicines affecting coagulation**

1	Heparin sodium	inj, 5,000, IU/mL, 5 mL vial	CEB
2	Phytomenadione	inj, 1 mg/0.5 mL amp	DVA
3	Phytomenadione	inj, 10mg/mL 1mL amp	CEA
4	Protamine sulphate	inj, 10 mg/mL, 5 mL amp	CEB
5	Tranexamic acid	tab, 250 mg	CEB
6	Tranexamic acid	tab, 500mg	CEB
7	Warfarin sodium	tab, 1 mg	CVB
8	Warfarin sodium	tab, 5 mg	CVB

**10.3 Medicines to treat hyperkalaemia**

1	Potassium binding resin powder (sodium polystyrene sulfonate Kayexalate®)		DVA
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**11. Blood products and plasma substitutes**

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**11.1 Blood Products**

1	Cryoprecipitate	30-40mls	DVA
2	Fresh frozen plasma	200-300mls	DVA
3	Random donor platelet concentrates	50-70mls	CEB
4	Red cell suspensions adult	280-420mls	DVA
5	Red cell suspensions paediatric	size 100-200mls	DVA
6	Whole blood adult	450mls (405-495)	DVA
7	Whole blood Paediatric	size 100-225mls	DVA

**11.2 Plasma Derived Blood Products**

1.	Factor viii	CEB
2.	Factor ix	CEB

**11.3 Transfusion alternatives**

1.	Erythropoietin	CEB
2.	IV Iron	CEB
3.	Gelatin (as polygeline) (Haemaccel <sup>®</sup> )	i/v infusion, 500 mL pack DVA



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**12 Cardiovascular Medicines**

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**12.1 Antianginal Medicines**

1	Glyceryltrinitrate	tab (sublingual), 500 mcg	DEB
2*	Isosorbidedinitrate	tab, 10 mg	DEB
3	Nifedipine	cap, 10 mg	CVB
4	Nifedipine	tab, slow-release, 20 mg	CEB
5	Propranolol HCl	tab, 40 mg	DVA

**12.2 Antiarrhythmic Medicines**

1	Propranolol HCl	tab, 40 mg	DVA
2	Lignocaine HCl	inj, 1%, 25 mL vial	CEB
3	Verapamil	tab, 40mg	CEB
4	Verapami	tab(modified release), 40mg	CEB

**12.3 Antihypertensive Medicines**

1	Amlodipine	tab, 5mg	DVA
2	Atenolol	tab, 50mg or 100mg	DVA
3	Captopril	tab, 12.5 mg	CVB
4	Enalapril	tab, 2.5 mg	DVA
5	Enalapril	tab, 5 mg	DVA
6	Hydralazine HCl	inj, 20 mg amp PFR	DVA
7	Hydralazine HCl	tab, 25 mg	DEA
8	Hydrochlorothiazide	tab, 25mg	DVA
9	Methyldopa	tab, 250 mg	DEA
10	Nifedipine	cap, 10 mg	DVA
11	Nifedipine	tab, slow-release, 20 mg	DVA
12	Nimodipine	tab, 30mg	CEB
13	Nimodipine	inj, 0.2mg/ml, amp	CVB
14	Prazosin	tab, 1 mg	CEB
15	Propranolol HCl	tab, 40 mg	DVA
16	Reserpine	tab 250 micrograms	DVA
17	Reserpine	inj, 1 mg/mL, 1 mL amp	DEA

**12.4 Medicines used in heart failure**

1	Digoxin	tab, 250 mcg	DVA
2	Digoxin	inj, 250 mcg/mL	DVA

2 mL amp

MEML 2015

3	Digoxin	tab, paed, 62.5 mcg	DVA
4	Digoxin	elixir, 50 mcg/mL	DVA
5	Dopamine	inj, 40mg/ml, 5ml, vial	CEB
6	Enalapril	tab, 5mg	DEB
7	Epinephrine	inj, 0.001mg/ml, 10ml, amp	DEB
8	Frusemide	tab, 40mg	HVA
9	Furosemide	inj, 10mg/ml, 5ml, amp	DVA
10	Glyceryltrinitrate	tab (sublingual), 500 mcg	DEB
11	Isosorbidedinitrate	tab, 10 mg	DEB
12	Metoclopramide	inj, 5mg/ml, 2ml, amp	DEA
13	Metolazone	tab, 5mg	CEB
14	Morphine	inj, 1mg/ml, 2ml, amp	DVA
15	Spironolactone	tab, 25 mg	DVB

#### 12.5 Antithrombotic medicine

	Acetylsalicylic acid	tab, 100 mg	DVA
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#### 12.6 Lipid-lowering agents

	Simvastatin	tab, 40mg	CVA
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#### 12.7 Antihypotensive medicines

1	Dopamine HCl	inj, 40 mg/mL, 5 mL amp	CVB
2	Ephedrine sulphate	inj, 30 mg/mL, 1mL amp	DVA
3	Methoxamine HCl	inj, 20 mg/mL, 1 mL amp	CVB

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**13 Dermatological medicines (Topical)**

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**13.1 Antifungal Medicines**

1	Benzoic acid + Salicylic acid	ointm, 6% + 3%, 500 g	HEA
2*	Clotrimazole (or equivalent alternative)	cream, 1%, 20g	DEA
3	Econazole	cream, 1%, 30g	DEA
4	Sodium thiosulphate	lotion, aq., 10%, 500 mL	DEA
5	Miconazole	cream, 2%, 30g	DEA

**13.2 Anti-infective medicines**

1	Calamine lotion + Sulphur 2%	lotion, aqueous, 500 mL	HEA
2	Chlohexidinedicluconate	soln, 0.2%, 500ml	DVA
3	Gentian violet	paint, aq., 0.5%, 500 ml	HEA
4	Hydrogen peroxide	soln, 20 volume, 500 mL	DEB
5	Iodine	soln, weak, 500 mL	DEA
6	Potassium permanganate Solution	3%, 500 mL (for dilution)	HEA HEA
7	Povidone iodine	soln, 10%, 500ml	DEA
8	Salicylic acid + Sulphur	ointt, 5% + 5%, 500g (in YSP base)	HEA
9	Salicylic acid + Sulphur	ointn, 5% + 5%, 500 g (In EO base)	CEB
10	Silver sulphadiazine	cream, 1%, 500 g	CEB
11	Zinc ointment + Sulphur 5%	ointn, 500 g	DEA
12	Zinc paste compound + Sulphur 5%	paste, 500 g	DEA

**13.3 Anti-inflammatories and antipruritic Medicines**

1	Calamine lotion + Sulphur 2%	lotion, aq, 500 mL	HEA
2	Hydrocortisone	oint, 1%, 15 g	DEA
3	Betamethasone (asvalerate)	oint, 0.15, 15 g	CEB
4	Calamine	lotion, aq, 500 mL	CEB
5	Clobetasol propionate	oint, 0.05%, 30g	CVB

**13.4 Medicines affecting skin differentiation and proliferation**

1*	Benzoyl peroxide	gel, 5%, 30 g	DEA
2	Crude coal tar 10%	oint, 500 g	CEB
3	Dithranol 0.5% in zinc + Salicylic acid paste	paste, 500g	CEB
4	Podophyllum resin	paint, alcoholic, 15%, 20 mL (compound benzoin tincture)	DEA
5	Salicylic acid	lotion, 5%, 500 mL (in alcohol 70%)	DEA
6	Salicylic acid	oint, 10%, 500 g	DEA
7	Salicylic acid (in YSP base)	oint, 20%, 500 g	CEA
8	Salicylic acid 2% + Coal tar solution 15% + Sulphur 2%	shampoo, 500 mL (in soap spirit base)	DEA
9*	Salicylic acid	collodion, 12%	DEA
10	Salicylic acid + crude coal tar 5%	oint, 500 g (in YSP base)	CEB
11	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	oint, 500 g	HEA
2*	Ethyl Chloride	spray, 3%	HEA
3*	Silver nitrate	pencil toughened, 40%	DEA
4	Yellow soft paraffin	oint, 500g	DEA
5	Zinc oxide (in EO base)	oint, 15%, 500 g	HEA

<b>14. Diagnostic agents</b>			
<b>14.1 Ophthalmic Medicines</b>			
1	Fluorescein sodium	eye drops, 1% (Minims)	DEA
<b>14.2 Radiocontrast media</b>			
1.	Barium sulphate	susp oral, 98%, 340 g pack PFR,	DEA
2.	Barium sulphate	susp oral for CT; 21% package btle	CEB
3.	Barium sulphate	susp, for CT colonoscopy 40%;kit	CEB
4.	Barium sulphate	enema, disposable, 93%, 400 g pack	CEB
5.	Effervescent agent (carbex)	granules(oral), 25 g sachet	CEB
6.	Effervescent agent (carbex)	soln(oral), bottle	CEB
7.	Feridex(Ferumoxide;	MRI-TAgent)	CEB
8.	Gastrografin	susp, (oral/rectal) 100g	CEB
9.	GoLYTELY	electrolyte solution (polyethylene glycol(PEG)	CEB
10.	Magnevist	inj, 0.5mmol/mL, 100mL vial	CEB
11.	ProHance	(gadopentetatedimeglumine; MRI-T1 Agent) (gadoteridol 379; MRI- T1 Agent)	CEB
12.	Resolvist	(Iron oxide anoparticles MRI-T2 Agent)	CEB
13.	NullLyte electrolyte solution (sodium amidotrizoate+	(polyethylene glycol(PEG) 660 g meglumineamidotrizoate)	CEB
14.	Urografin (sodium amidotrizoate + meglumineamidotrizoate	60% inj 0,08 g 0,52 g/ml).	CEB
15.	Urografin (sodium amidotrizoate	76% inj 0,10 g	CEB
16.	Ultravist	300 inj (iopromide 300 mg mL)	CEB
17.	Ultravist	370inj (iopromide 370 mg/mL)	CEB

18. Visipaque	320 inj (Iodixanol 652mg/mL)	CEB
19. +meglumineamidotrizoate	0,66 g/ml)	
20. Xenetix	250 inj (Iobitridol,250 mg iodine/mL)	CEB
21. Xenetix	300 inj,(Iobitridol,300 mg iodine/mL)	CEB
22. Xenetix	350,inj (Iobitridol ,350 mg iodine/mL)	CEB
23. X-prep liquid	(130mg sennocides, bowel evacuant)	
	bottle	CEB

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**15 Disinfectants and Antiseptics**

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**15.1 Antiseptics****15.2 Disinfectants**

1	Cetrimide + chlorhexidine	soln, 15% + 1.5%	HVA
		(For dilution)	
2	Black disinfectant	soln for dilution)	HVA
3	Glutaraldehyde	soln, buffered, 2%	DEA
4	Povidone Iodine	soln, 10%, 500mg, bottle	DVA



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**16. Diuretics**

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1	Bendrofluazide	tab, 5 mg	DVA
2	Furosemide	tab, 40 mg	DVA
3	Furosemide	inj, 10 mg/mL, 2 mL amp	DVA
4	Hydrochlorothiazide	tab, 25 mg	DVA
5	Mannitol	inj, 20%, 250 mL bottle	DEA
6	Spirolactone	tab, 25 mg	DEA

**17. Gastrointestinal medicines**

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**17.1 Antacids and other antiulcers medicines**

1	Cimetidine	tab, 400 mg	CVB
2	Bismuth chelate	liquid, 120 mg/5 mL, 560 mL	CEB
3	Magnesium trisilicate	tab, chewable	HEA
5	Omeprazole	tab, 10mg	DVA
4	Ranitidine	tab, 150 mg (tripotassiumdictratobismuthate)	CEB

**17.2 Antiemetics**

1	Cyclizine	tab, 25mg	CEB
2	Metoclopramide HCl	inj, 5 mg/mL, 2 mL amp	DEA
3	Promethazine HCl	tab, 25 mg	DEA
4	Promethazine HCl	elixir, 5 mg/5 mL	DEA
5	Promethazine HCl	inj, 25 mg/mL, 2 mL amp	DEA
6	Prochlorperazine	tab, 5mg	CEB

**17.3 Anti-inflammatory medicines**

1	Hydrocortisone	inj, 50mg/ml, 2ml vial	DEA
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**17.4 Laxatives and Cathartics**

1	Bisacodyl	tab, 5mg	DEA
2	Glycerol	suppository (child) 2 g	DEA
3	Lactulose	soln, 3.1mg/5ml	CVA
4	Liquid paraffin	soln	HVA

## 17.5 Medicines used in diarrhoea

### 17.5.1 Oral rehydration preparations

1	Oral rehydration salts	low osmolarity powder in sachet		
			for 1 litre	HVA
	(ORS)		(WHO citrate formula)	
2	ReSoMal		powder for 1 litre	DVA

### 17.5.2 Medicines for diarrhoea in children

1	Zinc		tab, 20mg	HVA
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### 17.5.3 Antimotility medicines

1	Codeine phosphate		tab, 15 mg	DVA
2*	Loperamide HCl		tab, 2 mg	DEA

## 17.6 Antihaemorrhoidals

1	Bismuth subgallate co.		suppository, 5g	DEA
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## 17.7 Antispasmodics

1	Atropine sulphate		inj, 600 mcg/mL	DVA
			1 mL amp	
2	Hyoscinebutylbromide		inj, 20 mg/mL, 1mL amp	DEA

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**18. Hormones, other Endocrine Medicines and Contraceptives**

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**18.1 Adrenal hormones and synthetic substitutes**

1	Dexamethasone	inj, 5 mg/mL, 5mL vial as sodium phosphate)	DVA
2	Dexamethasone	tab, 500 mcg	DEA
3	Hydrocortisone	inj, i/v, 50 mg/mL, 2 mL amp (as sodium succinate)	DVA
4	Prednisolone	tab, 5 mg	DVA
5	Hydrocortisone acetate	tab, 20 mg	CVB
6	Hydrocortisone acetate	inj, aq susp, (i/m or intra-articular) 25 mg/mL, 5 mL vial	CVB

**18.2 Contraceptives****18.2.1. Oral Hormonal contraceptives**

Combined, low-oestrogen

1	Levonorgestrel	surgical implant, 75mg	DVA
2	Levonorgestrel	tab, 750 mcg	DEB
3	Norgestrel + ethinylestradiol	tab, 0.3mg + 0.03mg	HVA
4	Norgestrel	tab, 0.75mg	HVA

Progestogen – only

**18.2.2 Injectable Hormonal contraceptive**

1	Medroxyprogesterone	inj, aq susp, acetate 150 mg/mL, 10 mL vial	HVA
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**18.3.3 Intra-uterine devices (IUD)**

1	Copper containing IUD	wire, 176mg	DVB
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#### 18.3.4 Barrier contraceptives

1	Female Condoms	pack, each	HVA
2	Male Condoms	pack, 100	HVA

#### 18.3.5 Implantable Contraceptives

1	Levonorgestrel-releasing implant	rod, 75mg	DVA
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#### 18.4 Oestrogens

1	Oestrogens, conjugated	tab, 625 mcg	CEB
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#### 18.5 Insulins and other medicines used for diabetes

1	Glibenclamide	tab, 5 mg	DVA
2	Gliclazide	tab, 80mg	CEB
3	Insulin, soluble (Human Actrapid ®)	inj, 100 iu/mL 10 mL vial	DVA
4	Insulin zinc suspension (Human Monotard ®)	inj, 100 lu/mL 10 mL vial	DVA
5	Metformin HCl	tab, 500 mg	DVA
6	Metformin HCl	tab, 850mg	DVA

#### 18.6 Ovulation inducers

1	Clomiphene citrate	tab, 50 mg	CEB
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#### 18.7 Progestogens

1	Norethisterone	tab, 5 mg	CEA
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**18.8 Thyroid hormones and antithyroid medicines**

1	Iodine	aqueous soln, oral, 30 mL (Lugol's iodine)	DEA
2	Carbimazole	tab, 5 mg	CVA
3	Thyroxine sodium	tab, 100 mcg	CVA
4	Levothyroxine	tab, 0.05mg	CVB

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**19. Immunologicals**

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**19.1 Immunological diagnostic agents**

1	Tuberculin purified Protein derivative (PPD)	inj soln 1 mL amp/vial	DVA
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**19.2 Sera and immunoglobulins**

1	Anti D (RH <sub>0</sub> ) Immunoglobulin (Human)	inj, 250 mcg/mL, 1 mL amp	DVA
2	Antirabies serum	inj, 30IU/ml, 1ml, vial	DVA
3	Diphtheria antitoxin	inj, 20,000 IU/vial	DVA
4	Tetanus antitoxin	inj, 20,000 IU/vial	DVA
5	Tetanus antitoxin	inj, 1,500 IU/vial	DVA

**19.3 Vaccines**

## 19.3.1 Vaccines for universal immunisation

1	Diphtheria-pertissis- tetanus (DPT) vaccine	inj, 20-dose (10 mL) vial (triple vaccine)	HVA
2	BCG vaccine (adsorbed)	inj, 20 dose vial PFR	HVA
3	Measles vaccine, live	inj, 10-dose (5mL) vial PFR	HVA
4	Poliomyelitis vaccine live	oral susp, 20-dose dispenser	HVA
5	Tetanus toxoid vaccine	inj, 10 mL vial	HVA
6	Pentavalent vaccine (diphtheria, tetanus, pertussis Hepatitis B, heamophilus Influenza)	inj, 2 dose vial	HVA
7	Pneumococcal Conjugate Vaccine	inj, 0.5mL prefilled syringe	HVA
8	Rotavirus vaccine	inj, PFR	HVA

### 19.3.2 Vaccines for specific individuals

1	Polyvalent Snake Antivenom	inj	DVA
2	Rabies vaccine	inj, 1-dose (0.5 mL) vial (PFR + diluent amp)	DVA
3	Yellow fever vaccine	inj, 10-dose (5 mL) vial (PFR + diluent amp)	CEB



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<b>20</b>	<b>Muscle relaxants (peripherally acting) and cholinesterase inhibitors</b>		
1	Alcuronium chloride	inj, 5 mg/mL, 2mL amp	CEB
2	Edrophonium chloride	inj, 10 mg/mL, 1 mL amp	CVB
3	Neostigmine methysulphate	inj, 2.5 mg/mL, 1 mL	CEB
4	Suxamethonium chloride	inj, 50 mg/mL, 2 mL amp	DVA
5	Vecuronium bromide	inj, 10 mg vial PFR	CEB

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**21. Ophthalmological preparations**

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**21.1. Anti-infective Agents**

1	Acyclovir	tab, 200mg	DVA
2	Acyclovir	tab, 400mg	DVA
3	Acyclovir	oint, 3%, 4.5g	DVA
4	Amphotericin B	eye drops, 0.15%	CEB
5	Econazole	eye oint, 1% 15g	CEB
5	Erythromycin	eye oint, 0.5%, 3.5g tube	CEB
6	Ganciclovir	inj, 500mg PFR vial	CEB
7	Ganciclovir	tab, 500mg	CEB
8	Foscarnet	inj, 24mg/ml, 250ml bottle	CEB
9	Gentamicin (as sulphate)	eye drops, 0.3%, 5 mL	HVA
10	Idoxuridine	eye drops, 0.1%, 5 mL	CEB
11	Miconazole	eye drops, 1%, 10 mL	CEB
12	Natamycin	ophthalmic susp, 5%	CEB
13	Tetracycline HCl	eye oint, 1%, 3.5 g tube	HVA

**21.2 Anti-inflammatory agents**

1	Dexamethasone	eye drops, 0.1%, 5 mL	CVA
2	Emadastine	eye drops, 0.05%, 5ml	CEB
3	Fluoromethalone	eye drops 0.1%, 5ml	CEB
4	Flucinoloneacetone	implants, 0.59mg	CEB
5	Ketotifen	eye drops, 0.025ml	CEB
6	Methylprednisolone acetate Acetate	inj, 40 mg/mL, 2 mL vial (for sub-conjunctival)	CEB
7	Nedocromil	eye drops, 2%, 5ml	CEB
8	Prednisolone	eye drops, 0.5%, 5ml	CEB
9	Triamcinolone acetone	inj, 40mg/ml, 1ml vial	CEB

### 21.3 Local anaesthetics

1	Amethocaine HCl	eye drops, 1%, 10 mL	DEA
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### 21.4 Miotics and antiglaucoma medicines

1	Acetazolamide	tab, 250 mg	DVA
2	Acetazolamide	inj, 500 mg vial PFR	CEB
3	Bimatoprost	eye drops, 0.03%, 3ml	CEB
4	Brinzolamide	eye drops, 1%, 5ml	CEB
5	Betaxolol	eye drops, 0.25%, 0.25ml	CEB
6	Brimonidine	eye drops, 0.2%, 5ml	CEB
7	Dorzolamide	eye drops, 2%, 5ml	CEB
8	Glycerol	oral soln, 50%	CEB
9	Latanoprost	eye drops, 0.005%, 2.5ml	CEB
10	Pilocarpine HCl	eye drops, 1%, 10 mL	CVA
11	Timolol maleate	eye drops, 0.25% 5 mL metered dose unit	CVA
12	Travoprost	eye drops, 0.004%, 2.5ml	CEB

### 21.5 Mydriatics

1	Atropine sulphate	eye oint, 0.5%, 3.5 g tube	DVA
2	Cyclopentolate HCl	eye drops, 0.5%, 5 mL	DEA
3	Tropicamide	eye drops, 0.5%, 5 mL	CEB
4	Phenylephrine	eye drops, 2.5%	CEB
5	Phenylephrine	eye drops, 10%, 10ml	CEB

### 21.6 Others

1	Ascorbic acid	tab, 200mg	DEB
2	Carmellose	eye drops, 0.5%, 10ml	DEB
3	Sodium ascorbate	eye drops, 10%	DEB

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## 22 Obstetric medicines

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### 22.1 Oxytocics

1	Dinoprostone	vag, gel, 200 mcg/mL 2.5. mL (500mcg)	CVB
2	Dinoprostone	vag tab, 3 mg	CEB
3	Ergometrine maleate	inj, 500 mcg	HVA
4	Misoprostol	tab, 200mcg	DVA
5	Oxytocin	inj, 10 IU/mL, 1 mLamp	HVA

### 22.2 Antioxytocics

1	Nifedipine	tab, 10mg, SR	DVA
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### 22.3 Myometrialrelaxants

1	Salbutamolsulphate	tab, 4 mg	HVA
2	Salbutamol sulphate	inj, 1 mg/mL, 5 mL amp	DVA

### 22.4 Medicines used in severe Pre-Eclampsia and Eclampsia

1	Magnesium sulphate (MgSO <sub>4</sub> .7H <sub>2</sub> O)	inj, 500 mg/mL, 2 mL amp	HVA
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### 22.5 Medicines used in primary PPH

1	Oxytocin	inj, 10 IU/mL, 1 mL amp	HVA
2	Misoprostol	tab, 200mcg	DVA

### 22.6 Medicines used in secondary PPH

1	Amoxicillin	tab, 500mg	HVA
2	Erythromycin	tab, 250mg	HVA
3	Gentamicin	inj, 40 mg	HVA
4	Metronidazole	tab, 200mg (as sulphate) mL, 2 mL vial	HVA
5	Oxytocin	inj, 10 IU/mL, 1 mLamp	HVA

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<b>23</b>	<b>Peritoneal dialysis solutions</b>		
1	Dianeal + dextrose	1.5% intraperitoneal dialysis	CVB
		Soln, 1 L bottle	
2	Dianeal + dextrose	4.25% intraperitoneal dialysis	CVB
		Soln, 1 L bottle	

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**24 Medicines for mental and behavioural disorders**

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**24.1 Medicines used in psychotic disorders**

1	Chlorpromazine HCl	tab, 100 mg	DVA
2	Chlorpromazine HCl	inj, 25 mg/mL, 2 mL amp	HEA
3	Chlorpromazine HCl	tab, 25 mg	HEA
4	Fluphenazinedecanoate mp	inj, oily, 25 mg/mL 2 mL a	DVA
5	Fluoxetine	cap, 20mg	DVA
6	Fluoxetine	tab, 10mg	DVA
7	Haloperidol	tab, 1.5 mg	DEA
8	Haloperidol	tab, 5mg	DEA
9	Haloperidol decanoate	inj, oil, 50 mg/mL, 1 mL amp	DEB
10	Risperidone	tab, 0.5 mg	DVA
11	Risperidone	tab, 1 mg	DVA
12	Risperidone	tab, 2 mg	DVA
13	Sodium Valproate	tab(crushable), 100mg	CEB
14	Sodium Valproate	tab, 500mg	CEB

**24.2 Medicines used in mood disorders****24.2.1 Medicines used in depressive disorders**

1	Amitriptyline HCl	tab, 25 mg	HVA
2	Amitriptyline HCl	inj, 10 mg/mL	CVA
3	Fluoxetine	tab, 20mg	DVA

**24.2.2 Medicines used in bipolar disorders**

1	Carbamazepine	tab, 200 mg	DVA
2	Sodium Valproate	tab, 200mg	CVA

### 24.3 Medicines for anxiety disorders

1	Chlordiazepoxide hydrochloride	cap, 5mg	CVA
2	Chlordiazepoxide hydrochloride	cap, 10mg	CVA
3	Chlordiazepoxide hydrochloride	cap, 25mg	CVA
4	Diazepam	inj, 5 mg/mL, 2 mL amp	DVA
5	Diazepam	tab, 5 mg	DEA
6	Lorazepam	tab, 1 mg	HEA

### 24.4 Medicines used for obsessive-compulsive disorders

1	Fluoxetine	cap, 20mg	CVA
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### 24.5 Medicines for disorders due to psychoactive substance use

1	Chlordiazepoxide hydrochloride	cap, 5mg	CVA
2	Chlordiazepoxide hydrochloride	cap, 10mg	CVA
3	Chlordiazepoxide hydrochloride	cap, 25m	CVA
4	Thiamine	inj, 100mg/ml	DEB

### 24.6 Other Medicines for mental disorder

1	Benzhexol	tab, 5mg	DEB
2	Procyclidine HCl	inj, 5 mg/mL, 2 mL amp	CEB
3	Procyclidine HCl	tab, 5mg	CEB

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**25. Medicines acting on the Respiratory Tract**

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**25.1 Antiasthmatic and medicines for chronic obstructive pulmonary disease**

1	Aminophylline	tab, 100 mg	HVA
2	Adrenaline	inj, 1/1,000, 1 mL amp	HVA
3	Aminophylline	inj, 25 mg/mL, 10 mL amp	DVA
4	Beclomethasone Dipropionate	aerosol inhalation, 50 mcg/dose,200-dose unit	CVB
5	Salbutamol sulphate	tab, 4 mg	HVA
6	Salbutamol Sulphate	inj, 1 mg/mL, 5 mL amp	DVA
7	Salbutamol Sulphate	aerosol inhalation 100 mcg/dose,200 – dose unit	DVA
8	Salbutamol Sulphate	respirator soln, 1 mg/mL single dose nebuliser amps	DVA
9	Sodium cromoglycate	spincap, 20 mg (for use with an insufflator)	CEB
10	Theophylline	tab, 250mg	CEB



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**26. Solutions correcting water, electrolytes and acid-based disturbances**

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**26.1 Oral preparations**

- |    |                                  |  |     |
|----|----------------------------------|--|-----|
| 1. | Oral rehydration salts,<br>(ORS) | powder in sachet for I L<br>(WHO low osmolarity) | HVA |
| 2  | Potassium chloride               | tab, slow release, 600 mg                        | DVA |

**26.2 Parenteral preparations**

- |    |  |   |     |
|----|--|---|-----|
| 11 | Dextrose Normal Saline (D5NS)                                    | i/v infusion, 0.9% NaCl +<br>5% dextrose, 1L pack | DEB |
| 1  | Glucose (dextrose)   | inj, 50%, 20 mL amp                               | HVA |
| 2  | Glucose (dextrose)   | i/v infusion, 5%, 1L pack                         | HVA |
| 3  | Glucose (dextrose)   | i/v infusion, 10%, 100 L pack                     | DVA |
| 4  | Sodium lactate comp<br>(Ringer-lactate or Hartmann's solution)   | i/v infusion, 1L pack                             | HVA |
| 5  | Water for injections   | for i/v use, 10 mL amp                            | HVA |
| 6  | Potassium chloride   | inj, 20%, 10 mL amp                               | CVA |
| 7  | Sodium bicarbonate   | inj, 4%, 50 mL vial                               | DVA |
| 8  | Sodium chloride  | i/v infusion, 0.9%, 1L pack                       | HVA |
| 9  | Sodium lactate + glucose<br>(Darrow's ½ strength in dextrose 5%) | i/v infusion, 1L (adult) pack                     | DEB |
| 10 | Sodium lactate + glucose   | i/v infusion, 200 mL (paed)                       | DVA |

<b>27</b>	<b>Vitamins and minerals</b>		
1	Vitamin A	cap, 200,000 IU (liquid or gel filled)	HVA
2	Vitamin B Co. strong	tab	HEA
3	Nicotinamide	tab, 50 mg	DEA
4	Pyridoxine HCl	tab, 20 mg	HVA
5	Thiamine	inj, 100mg/ml	DEB
6	Vitamins, multiple	syrup	HEA
7	Vitamins, multiple	tab	HEA
8	Calcium gluconate	tab, chewable, 500 mg	CEB
9	Vitamins, multiple	inj, i/v, high-potency 10 mL (in 2 amps)	DEB
10	Calciferol, high-strength	tablet, 10,000 IU	CVB
11	Calcium gluconate	inj, 10%, 10 mL, amp	CVB
12	Vitamin B <sub>12</sub>	tab, 0.005mg	HEA
13	Vitamin K	tab, 10mg	DEB
14	Vitamin K	inj, 10mg/ml, 1mL amp	DEB

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**28. Ear, Nose and throat medicines in Children**

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**28.1 Preparations for the ear**

1	Acetic acid	ear drops, 2%	HEA
2	Ampicillin	cap, 250mg	DVA
3	Amoxicillin	cap, 250mg	HVA
4	Betamethasone	oint, 0.15, 15 g	CEB
5	Beclomethasonedipropionate	nasal spray, 50mcg/spray	DEB
6	Ciprofloxacin	eardrops CVA	
7	Chloramphenicol	ear drops, 5%, 10 mL	DVA
8	Ceftriaxone	inj, 1g PFR	DVA
9	Cloxacillin	cap, 250mg	DEA
10	Cetirizine	tab, 10mg	DEB
	Erythromycin	tab, 250mg	HVA
11	Flucloxacillin	cap, 250 mg	DVA
12	Metronidazole	tab, 200mg	HVA
13	Hydrocortisone	oint, 1%, 15 g	DEA
14	Liquid paraffin	soln HVA	
15	Oxymetazoline hydrochloride	nasal drops 0.1%, spray 0.1%	DEB

**28.2 Preparations for the oropharynx**

1	Gentian violet	paint, aq., 0.5%, 500 mL	HEA
2	Nystatin	oral susp	DEA
		100,000 IU/mL, 20 mL	
		(with graduated dropper)	

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**29. Specific Medicines for Neonatal Care**

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**29.1 Medicines administered to the neonate**

1. Chlorhexidine digluconate                      soln, 7.1%,                      HVA

**29.2 Medicines administered to the mother**

1. Betamethasone sodium                      inj, 4mg/ml, 1ml amp                      CEB  
phosphate
2. Dexamethasone                      inj, 4mg/ml, 2ml vial                      DVA

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**30. Medicines for Arthritis**

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**30.1 Medicines used to treat gout**

1	Allopurinol	tab, 100 mg	DEA
2	Colchicine	tab, 500mcg	DVB

**31.1 Medicines used to treat Nutritional Disorders**

1.	Albendazole	tab, 200 mg	HEA
2.	Amoxicillin	cap, 250 mg	HVA
3.	Benzylpenicillin	inj, 4 g vial PFR (=5 MU)	HVA
4.	Cotrimoxazole	tab, 480 mg	HVA
5.	Ciprofloxacin	tab, 250mg	DVA
6.	Ciprofloxacin	tab, 500mg	DVA
7.	Dextrose 50%	inj, 50%, 50mL	DVA
8.	Folic Acid	tab, 5 mg	HEA
9.	Furosemide	inj, 10mg/ml, 5ml, amp	DVA
10.	Gentamycin	inj, 40 mg (as sulphate) mL, 2 mL vial	HVA
11.	Iron +Folic Acid	tab, 200 mg	HEA
12.	Metronidazole	tab, 200 mg	HVA
13.	Mebendazole	tab, 500mg	HEA
14.	Nicotinamide	tab, 50 mg	DEA
15.	Potassium chloride	tab, slow release, 600 mg	DVA
16.	ReSoMal	powder for 1 litre	DVA
17.	Vitamin A	cap, 100 000iu	HEA
18.	Vitamin A	cap, 200,000IU	HEA
19.	Vitamins,	syrup, multiple vitamins	HEA

### 31.2 Non-medicinal therapeutic products used to treat Nutritional Disorders

Ready to use therapeutic food (RUTF)	260g	DVA
Ready to use therapeutic food (RUTF)	sachet, 92 g	DVA
Corn Soya Blend++		
LikuniPhala		DVA
F-75 milk based formulation		DVA
F-100 milk based formulation		DVA

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