



PREVENTION & TREATMENT GUIDELINES FOR PRIMARY HEALTH CARE CENTRES AND HOSPITALS

**MINISTRY OF HEALTH
GOVERNMENT OF SOUTHERN SUDAN
2006**



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FOREWORD

In the Government of Southern Sudan (GOSS) Health Policy, the Primary Health Care programme is the cornerstone of the delivery of quality health care to all our people.

The program has three basic levels, namely the Primary Health Care Unit, the Primary Health Care Centre and the referral facilities. Being aware of the need to consolidate these services, the Ministry of Health has developed the Prevention and Treatment Guidelines for Primary Health Care Units, Primary Health Care Centres and Hospitals. These Guidelines will ensure the standardization and the maintenance of high quality of care at this level of our Primary Health Care programme.

The Ministry of health continues to develop and raise the awareness and training levels of our health care personnel at all levels. This manual provides a vital link in that process and it is our hope that our service providers will use it as such for the improvement of service delivery at all our health facilities.

This and other manuals developed by the Ministry will continue to be updated over time to meet any evidence based recommendations arising from scientific research, modern developments, innovations, lessons learned or best practices that will be suitable to our context and deemed necessary to improve our Primary Health Care services.



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October, 2006

ACKNOWLEDGMENTS

Following the conclusion of the comprehensive peace agreement between the government of the Sudan and the Sudan People's Liberation Movement/Army (SPLM/A) in Kenya on the 9th January, 2005, and the subsequent ending of the war in Southern Sudan.

The Ministry of Health, Government of Southern Sudan has a great challenge to ensure equitable, sector wide, accelerated and expanded quality health care for all people in Southern Sudan, with a special focus and emphasis on women and children.

Thus the development of the Treatment Guideline is one of the efforts towards this mission, especially at this post conflict period when there is high demand for knowledge and guideline needed for treatment at different levels of health facilities in Southern Sudan. This document will also meet the demand to ensure appropriate management using recommended essential medicines.

The Ministry of Health, Government of Southern Sudan would like to thank all the UN Agencies and International and local NGOs in Southern Sudan, as well as the technical health personnel from various institutions who have played an important role in the development and finalization of the Southern Sudan Treatment Guideline.

The Ministry gratefully acknowledges the technical guidance and constructive comments provided towards the development of this guideline. Profound gratitude and thanks are also addressed to the agencies which have supported the Ministry financially to develop and process this important document.

INTRODUCTION

Basic health care

The main vision of the national health policy for South Sudan is to develop a health care system with access for all. This is further described in the basic health care package.

The basic system has three levels, the Primary Health Care Unit, Primary Health Care Centre and the first line referral hospital. In the future, State and Teaching hospitals will be further developed but they are beyond the scope of this book at present.

Each level has its own tasks, responsibilities and limitations. A manual for the PHC Unit has been written in 2005. These guidelines are mainly meant to describe the different tasks for the PHC Centre and the Hospital in prevention as well as in treatment. Specific hospital tasks such as details of surgery, obstetrical procedures and anaesthesia have been left out, there are excellent textbooks available for that and the procedures are not specific for Sudan.

Other treatments like sleeping sickness or dental care obviously need more detailed training. In these guidelines they have been written as overviews for the present health staff of the possibilities or as a reminder.

Patient Care

It is not stressed in each chapter but it cannot be stressed enough that the corner stone of good health care is a good relationship with the patient as well as with the surrounding community. Medicine is not only a technical science, it is a social science. If there is no basis of trust between health staff and patient not a lot will be achieved.

Rational drug use

This book is based on the concept of rational drug use. A good health care system provides health care for all. This can be achieved with limited resources but only when proper guidelines are followed.

Patients need medicines that are safe, effective and of good quality. The drugs have to be affordable and they have to be available. Because each government has financial limitations only the use of

essential drugs will ensure that people can get the best possible treatment within the resources present.

- I. The first step to achieve this is: only use medicines with their generic names; these are the original names of the active ingredients of the drug, also known as an international non-proprietary name (INN). The same drug, may be sold under a brand name (given by the company / manufacturer) which is often far more expensive. It is of vital importance that only good quality drugs are used.
- II. The next step is to make essential drugs available at each level of health care; the Primary Health Care Unit (PHCU), the PHC Centre (PHCC) and the Hospital. Each level has different diagnostic facilities and staff with different qualifications and responsibilities. Uncomplicated malaria or bronchitis can be treated at the PHC Unit level whereas a disease like tuberculosis will only be treated at PHC Centre or Hospital level and major surgery can only be performed at Hospital level. Therefore different essential drugs are needed for each level. An essential drug list for South Sudan has been developed which is also in line with both PHCU and PHCC/Hospital guidelines.
- III. The last step is Rational Drug Use. To give all patients the best care possible health workers have to use drugs wisely. There are many conditions that do not need medical treatment at all, for example a common cold, a headache or mild diarrhoea. With some advice and rest they will resolve within a short time. Also for common complaints like constipation and joint pains local herbal medicine may be available.

I am sure that all of us are familiar with the situation that medicines are finished in our clinics before the month is finished. So we really have to use them only for the patients who need them. For other diseases it is important to use medicines that have proven to be effective and to give them in the right dose and for the right period of time. Using drugs rationally will give the best treatment result and will reduce costs.

Over the past it has become clear that many medicines have been used too much or not in a sensible way. This has resulted in increasing resistance against certain drugs, for example antibiotics, but also anti-malarial and TB medication. Some medicines that were very useful in

the past are now becoming ineffective. We can partly prevent this if health workers use medicines rationally and in accordance to protocols.

Future reviews

This book is based on the latest evidence and experience. But essential drugs and guidelines will change over time. As new drugs become available and affordable and drug resistance increases, these guidelines and protocols will need to be adapted.

A National Drug and Therapeutic Committee must be established to keep abreast with new evidence on a regular basis and review the manuals every 3 years.

How to use this book

To use this book optimally you need to:

- Familiarise yourself with the contents
- Study the sections and know where to find them when you need them
- Keep this book readily available at work place or carry it with you
- Please give comments to improve the information for you

The Ministry of Health is fully committed to improving the general health of the population of Southern Sudan. The best and most effective strategy to do this is to prevent diseases. Until this point in history preventive activities have been quite limited. The first part of this book deals with preventive health which will help every health facility or programme cover the full range of preventive activities mentioned.

The second part of the book deals with curative care and management.

Explanation of drug dosage

There are several ways of writing this down. The following method has been used:

1. Patient weight groups - If the patient (child/adult) can be weighed, then, use the weight group
2. Age groups - , if you can not weigh use the age group

Under the weight group you find:

- The amount of drug per dose
- The number of doses per day
- The duration of the course of drugs

- At times it is written “as / when required”, meaning according to the pain e.g. paracetamol

As the manual has been written by different specialists some chapters may have different methods. If you do not know how to use a treatment please first clarify with senior staff.

How to dispense drugs

- The first dose of all drugs should be given at the health facility
- Side effects have to be explained
- Always get patients to repeat the instructions
- As a rule no more than one antibiotic should be prescribed with the exception of STI treatment or patients with severe infection like PID, requiring a combination treatment
- Ideally patients should not be given more than two types of drugs, as this can affect compliance and cause confusion
- Giving oral drugs to children can be a real problem, therefore sugar is provided in the clinics to mix with the medication. If a child is refusing or spitting out medication try to give rectally. This is relevant especially in the treatment of severe diseases like malaria or pneumonia
- Explain other non drug information, like plenty of fluids, follow up visit etcetera

Evaluation, revision and updating

The main objective of the manual is to keep all health workers updated with the latest evidence based standardized protocols appropriate for Southern Sudan.

To maintain the dynamism of the process, comments from the users of the manual is of crucial importance. Any comments on the manual must be forwarded for consideration to the following address / contact persons:

Ministry of Health, Government of Southern Sudan, Directorate of Pharmaceuticals Services.

Contact person: Dr. Manyang Agoth / Dr. Richard Igu Kera

ABBREVIATIONS

PID Pelvic Inflammatory Disease

1. IMMUNIZATION

1.1.	Standard Immunization of children and vitamin A	
1.2.	Supplementation	2
1.2.	Immunization of pregnant women	4
1.3.	Additional immunizations	4

1. IMMUNIZATION

1.3. STANDARD IMMUNIZATION OF CHILDREN AND VITAMIN A SUPPLEMENTATION

Immunization can prevent several dangerous diseases in children such as:

Tuberculosis, diphtheria, whooping cough, tetanus, polio and measles.

The schedule given below is the official immunization schedule for southern Sudan. The ages given are minimum ages for each vaccination; children should receive doses at these stated ages or at the first contact after reaching that age. The program also gives an upper limit in age. Vitamin A supplements can be given during the immunization sessions according to schedule.

Several vaccines can be given at the same time. This is important if the child is within the age range for immunization but has not received the earlier immunizations. A slight fever or minor illness should not prevent you from immunizing a child. A critically ill child needing hospital admission must be given the appropriate vaccines upon recovery.

NEVER MISS AN OPPORTUNITY TO VACCINATE A CHILD!

Remember:

- To inform mothers/caretakers about possible side-effects of each vaccine (see below)
- To record all vaccinations on the immunization cards and instruct the mothers to bring the cards along at each visit
- To instruct the mother to return for the next immunization on the appropriate date
- To maintain the cold chain and ensure appropriate cold storage for each vaccine as recommended. Vaccines are easily destroyed by heat
- To use a new syringe and needle for each vaccination!
- To handle disposal of needles safely and appropriately. (See chapter 5)
- To weigh the child, record the weight on the Road to Health Chart and give vitamin A if needed (see pg.3).
- EPI (the Expanded Program of Immunization) is also a good opportunity for health education

Immunization schedule for children

Minimum Age	Vaccines	Maximum age
At birth	OPV 0	4 weeks
At birth	BCG	11 months
6 weeks	DPT 1 and OPV 1	5 years
10 weeks	DPT 2 and OPV 2	5 years
14 weeks	DPT 3 and OPV 3	5 years
9 months	Measles	15 years

OPV = Oral Polio Vaccine

DPT= Diphtheria, Pertussis and Tetanus

Vaccine dose and route of administration

Vaccine dose	Route of administration
BCG Child under 1 year 0.05 ml	Intradermally into upper outer part of left forearm. A small wheal will appear at the sight of injection. A small sore will appear in 2-6 weeks. If no sore develops repeat the vaccination after 3 months
Polio (OPV) 2 drops by mouth. Follow instructions on bottle	Give the vaccine by mouth using the dropper provided. If child spits or vomits repeat the dose. Read instructions on the bottle
DPT 0.5 ml	Intramuscularly in the upper outer part of the thigh
Measles 0.5 ml	Intramuscularly in the upper outer part of the arm (deltoid muscle)

Expected side effects and treatment

Vaccine	Side effects	Treatment	Remarks
BCG	Small “sore” will develop at site of injection after a few weeks and may last for 2 to 12 weeks	Keep dry and clean (do not put any ointment or medicine on it)	Will leave a small scar
DPT	Mild temperature Redness, pain or slight swelling at site of injection	Tepid bath Paracetamol	Will disappear within 2-4 days
Measles	Mild temperature 6-10 days after vaccination Slight rash may appear	Tepid bath Paracetamol	Will disappear within 2-4 days

Vitamin A supplementation schedule

Dosage (in IU)	When to give
< 6 months 50.000 units	First dose at 3 months if the child is not breastfed.
6-12 months 100.000 units	If the child is breast fed, first dose at 9 months then every 6 months (twice per year) up to the age of 5 year
> 12 months 200.000 units	

1.2. IMMUNIZATION OF PREGNANT WOMEN

Immunization of pregnant women with Tetanus Toxoid (TT) prevents neonatal tetanus in newborn babies and tetanus in the mother. The immunization schedule is given below.

Immunization schedule for women of child bearing age

Dose	When given	Period of protection
TT1	At first contact with women of childbearing age, or as early as possible in pregnancy (from 4 th month)	No protection
TT2	At least 4 weeks after TT1	3 years
TT3	At least 6 months after TT2 or during next pregnancy	5 years
TT4	At least 1 year after TT3 or during next pregnancy	10 years
TT5	At lease 1 year after TT4 or during next pregnancy	All child bearing years

****Route of administration:** IM in the upper arm (deltoid muscle) **Dose:** 0.5 ml

1.3. ADDITIONAL IMMUNIZATIONS

In addition to the regular schedule of immunizations, the polio eradication campaign vaccinates all children up to five years of age against polio on National Immunization Days (NIDS). Children who receive this can continue to receive their regular polio vaccination as well. Other immunizations can be done at times to prevent epidemics of meningitis.

2. MASS TREATMENT OF DISEASES

1.	Soil Transmitted Helminths (Mass de-worming)	6
2.	Schistosomiasis/ bilharziasis	6
3.	Onchocerciasis	6
4.	Lymphatic Filariasis (Elephantiasis)	7
5.	Trachoma	7
6.	Vitamin A deficiency	7
7.	Sleeping sickness	7

2. MASS TREATMENT OF DISEASES

INTRODUCTION

****Not all diseases can be prevented by immunizations****

However there are several serious diseases that can be controlled and eventually even eradicated if the population at risk is given appropriate medicines on a regular basis. Not all geographic areas in Southern Sudan are at the same risk for diseases that respond to mass chemotherapy. Mapping of the various diseases and the relative risk in different regions of Southern Sudan is not complete but some information is known and some mass chemotherapy programs are functional.

Make sure you are aware of these programs, are providing assistance and motivating your community to participate. Examples include:

2.1. SOIL TRANSMITTED HELMINTHS (MASS DE-WORMING)

This can be done with Mebendazole 500mg or Albendazole 400mg. The population at risk is all children from age 1 year up to 15 years. This activity often takes place in schools especially in areas with a high worm load. It also may be distributed during NIDS campaigns targeting the age 1-5 year old children. Ideally this is done every 6 months.

2.2. SCHISTOSOMIASIS / BILHARZIASIS

This disease can cause chronic disability especially to the high risk group of school aged children. Mapping needs to be carried out in areas; if the prevalence is high a mass chemotherapy program with Praziquantel is carried out usually school-based once per year. Doses of medication are calculated on a weight basis and a teachers training course on the method of distribution has been developed. This program currently functions in only a few areas in Southern Sudan that have been mapped. The dose of Praziquantel is 40mg/kg as a single dose.

2.3. ONCHOCERCIASIS

Onchocerciasis is a debilitating disease that can cause blindness as well as severe skin disease. Mapping for this disease is completed and the mass distribution program has been developed. The medication, Mectizan / Ivermectin (150 micrograms of Ivermectin / kg in a single dose) is distributed to all persons above age five years in communities at risk. The program is carried out through community distributors.

2.4. LYMPHATIC FILARIASIS (ELEPHANTIASIS)

This disease has not yet been mapped. It is controlled by the mass distribution of Albendazole and Ivermectin given to all persons over age 5 years once a year in communities at risk. Mapping activities have been planned in the near future.

2.5. TRACHOMA

This is a chronic conjunctivitis that results in scarring of the eyelids and the end result can be blindness. Prevention is through improved hygiene (washing the face twice daily and washing hands after use of latrines) Azithromycin is distributed one or two times per year to everyone over the age of 1 year in villages with high prevalence.

2.6. VITAMIN A DEFICIENCY

As previously mentioned in chapter 1 vitamin A given twice a year to children under five is very beneficial to prevent blindness, and to reduce morbidity of diseases like measles. Vitamin A is currently distributed through the NIDS campaigns in Southern Sudan, but will be incorporated in regular programs in the future.

2.7. SLEEPING SICKNESS

There is no mass treatment but if cases are found in a certain village the whole population should be checked so that people can be treated at an early stage.

Drugs administered for mass treatment

Disease	Drug	Target Group	How Often	Do NOT combine with
Soil-transmitted Helminths	Albendazole or Mebendazole	Children 1 yr to 15 yrs	1-2 times/yr	Azithromycin
Schistosomiasis	Praziquantel	School aged children in risk areas	1-2 times/yr	Azithromycin
Onchocerciasis	Ivermectin	>5 yrs	One time/yr	
Lymphatic Filariasis	Albendazole and Ivermectin	>5 yrs	One time/ yr	
Trachoma	Azithromycin	Children > 1yr	1-2 times/yr	Albendazole, Ivermectin or Praziquantel

3. ANTENATAL CARE

First antenatal visit	10
Second antenatal visit	11
Third antenatal visit	12
Fourth antenatal visit	13
HIV testing during Antenatal Care	14
Postnatal visit	14

3. ANTENATAL CARE

INTRODUCTION

Women in Sudan have a very high risk of dying during pregnancy/ childbirth or losing their babies. Many interventions are needed to reduce the high maternal and neonatal mortality rates, including:

- Prevention of childhood marriages and teenage pregnancies
- Good nutrition and enough rest during pregnancy
- Focused antenatal care (ANC)
- Efforts to stop the spread of HIV and specific interventions to decrease transmission of HIV from mothers to babies
- Clean delivery by a trained health worker, preferably in a facility
- Referral for safe delivery to a hospital if needed
- Child spacing with an interval of more than two years
- Education of girls
- Macro economic interventions like roads and infrastructure

This chapter deals with the (basic) minimal package of antenatal care that every pregnant woman should receive. In case of complications the number of visits has to increase. For complications see chapter on obstetrics.

In an uncomplicated pregnancy, aim for four routine antenatal visits. If a woman comes for her first visit late in pregnancy, still try to cover all appropriate preventive measures.

Antenatal visit	Months of pregnancy	Medication/ preventive measures
1 st	3 – 5	TT1 or TT-booster SP1(after week 14) and FS/FA bed net (LLITN) HIV counselling and testing (if available)
2 nd	5 – 7	TT2 SP2 if first dose was given >1 month ago, FS/FA and Mebendazole 500 mg
3 rd	7 – 8	SP2 if not yet given and FS/FA, IBP
4 th	> 8	FS/FA, IBP

See abbreviations overleaf

<i>TT</i>	- <i>Tetanus Toxoid vaccine prevents neonatal tetanus</i>
<i>FS/FA</i>	- <i>Ferrous Sulphate and Folic Acid prevent anaemia</i>
<i>SP</i>	- <i>Sulphadoxine / Pyrimethamine and bed nets prevent malaria</i>
<i>IBP</i>	- <i>individual birth plan</i> <i>Mebendazole only in worm infested areas</i>
<i>LLITN</i>	- <i>Long lasting insecticide treated nets</i>

FIRST ANTENATAL VISIT:

1. Take history:

- Make an antenatal card
- Record name, age, marital status, occupation, educational status, residence and name of contact persons
- Medical History: include history of diabetes, hypertension, TB, sexually transmitted infections (STI's) and use of medication
- Obstetric history: record each pregnancy (including the ones ending in abortion): year, any problems before during or after the delivery, weight and sex of the baby and whether the baby was alive, stillborn or died within 1 week after delivery (early neonatal death)
- Current pregnancy:
 - LMP: first day of last menstrual period
 - Calculate number of months from LMP
 - Calculate the estimated delivery date (EDD) = LMP plus 7 days minus 3 months (LMP= first day of last menstrual period)
 - Ask for any problems encountered
- Ask for symptoms of STI's
- Social history: contraception history, smoking, alcohol, drugs abuse

2. Do the Examination:

- General examination: Nutritional status Blood pressure (BP), weight(in kg), anaemia, height(in cm), breasts (look for inverted nipples)
- Obstetric examination: symphysio-fundal height (SFH) in centimetres, any signs of multiple pregnancy, any abdominal scar

3. Laboratory tests:

- | | |
|------------------------------|----------------------------|
| • Blood for Haemoglobin (HB) | • Urine for albumin, sugar |
| • Syphilis and malaria | • HIV counselling /testing |

4. Give Health education:

- Make a delivery plan together with the patient and if possible a relative. Advise on hospital delivery in case of any danger signs in this pregnancy (see table below)
- Advise on proper nutrition, discourage any taboos on food; strongly advise against smoking and alcohol
- Discuss breast feeding and breast care
- Discuss symptoms of miscarriage, pre-term labour
- Counsel about HIV testing, which should be made available widely. (see later in this chapter under HIV testing)
- In a normal pregnancy it is safe to have sex during the whole 9 months, as long as the woman is comfortable

5. Management:

- Manage common complaints (see table below)
- Avoid unnecessary medicines
- Give the patient Tetanus toxoid 0.5ml IM in the upper arm (deltoid muscle), if she is more than 14 weeks pregnant
- Give Ferrous Sulphate (dose = 200 mg) + Folic acid (0.25 mg) once daily with a meal (since it is a gastric irritant); if she is anaemic give the dose twice daily. Give enough supply until the next visit. Caution for dark stools as a side effect of the iron
- Provide a long lasting insecticide treated bed net (LLITN)
- Give the ANC card and tell her the date of the next ANC visit

Management of common complaints in pregnancy:

Complaint	Action
Low backache	Exclude Urinary Tract Infection (UTI). Avoid heavy loads and take some rest during the day
Morning sickness	Exclude malaria and UTI. If not severe reassure up to 3 months. Advice to eat some light food, like biscuits or rice before getting up in the morning. If severe and dehydrated, admit
Indigestion (flatulence and constipation)	Advice to eat lots of green vegetables and fruits, drink plenty of fluids. Do not eat a heavy meal before bedtime.
Food cravings	Advice on a balanced diet, eat healthy foods according to appetite. Remember Ferrous Sulphate / Folic acid supplements.
Cramps	Drink lots of milk
Fatigue	Reassure, advice to take more rest. Remember Ferrous Sulphate Folic acid

SECOND ANTENATAL VISIT:

1. History:

- Ask if there are any problems since last visit
- Ask for the date of first foetal movements

2. Examination:

- Check BP, weight (gain should be about 1 kg / month)
- Check the SHF, foetal heart sounds(FH) and lie of the baby

3. Laboratory: urine for albumin / sugar

4. Health education:

- Repeat topics of first visit if needed
- Discuss important symptoms like ante partum haemorrhage (APH), this is vaginal bleeding after 7 months of pregnancy, blurred vision, early rupture of membranes and early labour
- Discuss family planning/ child spacing

5. Management:

- Give the second dose of TT if needed and if it is more than one month after the first visit
- Give Ferrous sulphate/ Folic acid
- Give 3 tablets of Sulphadoxine / Pyremethamine (SP)
- De-worm at least once after the first trimester with Mebendazole 500 mg as a single dose
- Give the date for the next ANC visit

THIRD ANTENATAL VISIT:

1. History:

- Ask if there are any problems since last visit
- Ask whether the foetal movements are normal

2. Examination:

- BP, weight, look for signs of pregnancy induced hypertension (PIH), oedema or severe anaemia
- SFH, FH sounds, lie, presentation, check for multiple pregnancy

3. Laboratory: Urine for albumin / sugar

4. Health Education:

- Discuss labour /early rupture of membranes

- Evaluate birth plan: if danger signs are present this may be the last chance to convince patient (and relative) to deliver in the hospital
- Discuss Family Planning (FP) / Child spacing

5. Management:

- Give Ferrous sulphate / Folic acid
- Give 3 tablets of Sulphadoxine / Pyrimethamine
- Give the date for the next ANC visit

FOURTH ANTENATAL VISIT:

1.2.3. History, examination and laboratory tests:

- as in third visit
- Confirm normal lie and presentation

4. Health education:

- This is the very last chance to discuss the birth plan, when to go and what to take

5. Management:

- Continue Ferrous Sulphate / Folic acid

Danger signs in pregnancy:

Antenatal	Labour and delivery	Post partum
• Haemorrhage • swollen limbs • headache, blurred vision, epigastric pain • convulsions • ruptured membranes without labour pains	• haemorrhage • mal presentation • obstructed labour	• haemorrhage • chills, backache, foul smelling vaginal discharge

Other risk factors

If there are danger signs the woman should be referred to a hospital early, especially if the distance is far. All deliveries have some risk therefore each woman should be advised to deliver at least at PHCC level.

Age under 16 or over 40	Multiple pregnancy
Height under 145 cm	Severe anaemia (Hb less than 7 g/l)
First pregnancy	HIV positive status
Previous caesarean section	Hypertension
Previous stillborn child	Diabetes
Previous Post Partum Haemorrhage	Any severe illness

Baby in breech or transverse lie after 36 weeks	History of three or more abortions successively
	Poor weight gain

HIV TESTING DURING ANTENATAL CARE

HIV infection can be transmitted from an HIV positive mother to her baby. This is the main cause of paediatric HIV infection. Most infected children die before they are two years old. The chance of infection from an HIV positive mother to her child can be reduced but this means we need to know the HIV status of the mother.

All pregnant women should be encouraged to learn their HIV infection status, as well as that of their sexual partner. In most cases, the pregnant woman will be HIV negative, and this news offers an opportunity to discuss prevention of HIV infection.

In ANC, pregnant women are seeking medical care to protect the health of her baby and herself. Therefore HIV counselling and testing should be offered to all ANC mothers, and is strongly recommended in facilities where services to prevent mother to child transmission (PMTCT) are in place.

Transmission rates

In a breast feeding population and in the absence of preventive interventions, the HIV transmission rate from an HIV- positive mother to her child is 30-45%

- During pregnancy 5 to 10%
- During labour 10 to 20%
- During breastfeeding:
 - ❖ first 6 months 1-10 %
 - ❖ 6-24 months an additional 5-10%

How to reduce mother to child transmission

- HIV prevention programs for women of child-bearing age
- Routine testing and counselling of all pregnant women
- Optimal obstetric care
- Short-course antiretroviral (ARV) prophylaxis for an HIV positive mother and her infant
- Counsel HIV positive mothers on place of delivery, exclusive breastfeeding and alternative infant feeding practices
- Making family planning methods available

POSTNATAL VISIT:

The first postnatal visit should preferably be done at home within 3 days by the midwife, MCH-worker or TBA:

She should:

1. Check the condition of the mother: bleeding, anaemia, fever, swelling of breasts, size of the uterus, perineum, vaginal discharge etc.
2. Check the condition of the baby. Weigh him or her if not yet done
3. Make sure that breast feeding is established
4. Advise mother about feeding herself
5. If condition not normal and reassuring, do more home visits or refer to facility, as appropriate
6. If mother and baby are well advise them to come to the clinic for BCG and weighing

4. PREVENTION OF MALARIA, ONCHOCERCIASIS AND KALA AZAR (INSECT BORNE DISEASES)

4.1. Malaria	17
<i>Prevention:</i>	<i>17</i>
<i>IPT: Intermittent presumptive treatment of malaria in pregnancy</i>	<i>17</i>
4.2 Onchocerciasis (OV)	18
<i>Prevention of infection or complications</i>	<i>18</i>
4.3. Kala azar	18
<i>Prevention</i>	<i>18</i>

4. PREVENTION OF MALARIA, ONCHOCERCIASIS AND KALA AZAR (INSECT BORNE DISEASES)

4.1. MALARIA

Malaria is common in Southern Sudan. It accounts for 20-40% of all visits to health facilities and is one of the leading causes of death. Most at risk are pregnant women, children under five, HIV positive persons and returnees from areas where the incidence of malaria is low, for example Nairobi or Khartoum

Prevention:

Malaria is spread by mosquitoes; therefore the best prevention is to reduce contact between humans and mosquitoes. This can be done through:

- Using bed nets: the best are the ones impregnated with insecticides. Nowadays long lasting insecticide-treated bed nets (LLITN's) are available, polyester nets impregnated with chemicals that last as long as the net itself. There are still older nets in use that need regular impregnation. The advantage of bed nets (if the mazes are small enough) is that they also protect against other vector born diseases like kala-azar and filariasis. Teach your clients how the nets should be used. Often the net is large enough for two persons, e.g. mother and child
- If possible screen doors and windows
- Wear protective clothing that covers arms and legs, especially in the evening and at night
- Control breeding sites: mosquitoes breed in stagnant water (empty containers, potholes and footprints). Either drain them or cover them with sand
- Avoid housing sites near mosquito infested areas

Intermittent presumptive treatment (IPT) of malaria in pregnancy

For prevention and control of malaria during pregnancy, the following interventions are advised:

All pregnant women should:

- ❖ Receive intermittent presumptive treatment (IPT) with SP (Sulphadoxine / Pyrimethamine) at least twice. (see chapter ANC)
- ❖ All pregnant women should sleep under insecticide treated nets.
- ❖ All pregnant women should receive *Ferrous /Folic acid*

Both mosquito nets and SP should be available free of charge for pregnant women.

4.2 ONCHOCERCIASIS (OV)

Onchocerca volvulus(OV), the name given to the microfilaria (baby worms) that cause Onchocerciasis. Onchocerciasis is spread by black flies. They bite during the day (usually at sunrise and sunset), on cloudy days or in the shade. The bites are very painful. The black fly breeds in fast flowing rivers. People who live or work near breeding sites are more prone to getting bitten.

Prevention of infection or complications

- Mectizan once a year for 10 years kills only the baby worms. The adult worms live up to ten years and during this span of time they produce microfilaria every year
- Reduce or avoid contact with black flies by
 - Cultivating, fishing or washing during times when the black fly doesn't bite
 - Staying in open places
 - Covering arms and legs when in high risk areas
 - Sleeping under a net

4.3. KALA AZAR

Kala azar is spread by sand flies. After the sand fly ingests the parasite from an infected person, it takes one week to multiply inside the fly. Sand flies:

- bite during the evening and night between March and June (the timing is uncertain in Kapoeta area)
- live in areas with acacia and balanite forests where there is cracked black cotton soil and in Kapoeta area

Prevention

- Mosquito nets offer protection. They must be fine mesh (a sand fly is smaller than a mosquito), a treated net or a cloth net. it is safe to sleep under one net with an infected person
- When you are not under the net wear clothing that covers your body. Women should keep their babies covered by their cloth or under the net
- Neem oil on your skin or other insect repellents prevent sand fly bites for a few hours
- There is no vaccine

5. HIV/AIDS PREVENTION

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HIV/AIDS PREVENTION

INTRODUCTION

The human immunodeficiency virus (HIV) is transmitted by body fluids, fluids produced during sex as well as blood and breast milk. Once someone has been infected by HIV the virus will slowly undermine the immune system and the body will become less able to fight infections.

This process takes several years (5-8 years is most common) but may progress more rapidly in some people. In the end the person gets AIDS (Acquired Immune Deficiency Syndrome). The patient is now highly prone to illnesses that do not usually occur in people with normal immune systems. People with AIDS also get ordinary infections more frequently. HIV/AIDS is not curable, although medicines and other measures can help infected people live longer.

Most infected people are not ill in the first years after infection and do not know they carry the infection. Most infections are spread by healthy-feeling and healthy-looking people. Infections are spread to sexual partners and mothers can transmit the virus to their babies. HIV thus affects not only individuals but whole families and communities. This is why preventing the spread of AIDS is crucial.

TRANSMISSION OF THE HIV VIRUS

There are three ways of transmission of HIV:

1. Sexual contact: this is the most common cause. Everybody who has unprotected sex (sex without a condom) may be at risk. Certain conditions increase the chance of HIV infection during sex with an infected person. For example, there is a high risk of transmission if either partner has a sexually transmitted infection. Young girls are more at risk especially if it their first time to have sex as small wounds or injuries may occur during first intercourse allowing HIV virus to enter easily.
2. Direct contact with certain other body fluids, most importantly blood. The fluid with the HIV in it must make contact with blood or mucous membranes in order for infection to occur. Intact skin is protective. Infection from blood can occur through use of contaminated needles (including accidental needle stick injuries) or transfusion of blood not tested for HIV. HIV can be transmitted by use of shared needles or knives in other settings, like traditional cutting practices.
3. From mother to baby, this can either happen during pregnancy, delivery or breast feeding (see chapter ANC).

Do not isolate people with HIV-they need you!
You cannot get AIDS from normal daily contact.
HIV is not transmitted by saliva or urine.
HIV is not transmitted by mosquitoes.
It is safe to share cups and plates, toilets and showers, sleep in the same room shake hands or hug people with HIV/AIDS

The number of people in Southern Sudan that are infected is not known. In some countries in Africa more than one in three adults is infected. To prevent a situation like this happening in Sudan, everyone needs to get involved in the fight against HIV/AIDS.

PREVENTION OF HIV TRANSMISSION

Prevention of sexual transmission:

There are three main ways in which we can prevent or reduce sexual transmission:

- **A= Abstinence:** If one doesn't have sex, there is no risk of HIV. However, permanent abstinence is not desirable for most people. "Reduction in the number of partners is very important. The greater the number of sexual partners a person has over the years, the greater the chance of getting HIV. Young people are counselled to wait until they are older to have sex, often until they marry.
- **B= "Be faithful":** People in stable, monogamous relationships will stay healthy as long as neither one has HIV. If one member of the couple has sex with other people, they increase the chance of getting HIV, which they can then give to their partner(s). Where VCT (Voluntary Counselling and Testing) is available, partners should be encouraged to get tested. For example, it is possible for one partner to be infected before marriage, and testing is the only way to identify that risk to the other partner. Partner testing is an important HIV prevention strategy, as many people with HIV have partners who are not yet infected.
- **C= Condoms:** Use of condoms greatly decreases the chance of acquiring HIV during sex. Condoms are very effective if used properly. If you do not know the HIV status of your partner, and cannot be sure s/he is faithful, the only way to protect yourself is by always using a condom during sex.

Special mention needs to be made of the vulnerable risk group of young girls. They often have no say in their first sexual relationship, because their first partner is in general older and more powerful. So education about the “ABCs of HIV prevention” will not be enough to protect these girls. We have to find ways in the community to protect them better.

The role of the health worker in prevention is to:

- o Be a good role model
- o Create awareness
- o Avoid stigmatizing people with HIV and giving them up as hopeless. Various kinds of treatment exist and many people with HIV can live productively for long periods of time with the proper care and support. Make your patients understand this.
- o Encourage the start of a support group for people living with HIV/AIDS, they can share experiences and support each other
- o Discuss safer sexual behaviour often and openly and putting emphasize on people with STIs and during ANC. In most societies talking openly about sex is sensitive. In this era of HIV/AIDS health workers must be able to communicate freely about HIV / AIDS
- o Discourage abuse of alcohol; people are more likely to engage in risky sexual behaviour under influence of alcohol.
- o Teach people about condoms and have them available
- o Help make HIV testing available in the area. Encourage the slogan: “KNOW YOUR STATUS”
- o Detect and adequately treat other sexually transmitted infection
- o Give counselling to HIV +ve people: they should always use condoms during sex even with their own partners; discuss the risk of transmission to a child if they wish to have children. Offer family planning.
- o Assure pregnant mothers that it is safe to have sex throughout pregnancy. Enforced abstinence during pregnancy may lead some partners to seek sex outside their marriage

Advice married couples not to stay apart for long periods (due to work, etc).

In addition to working with individual patients and their families, the health worker can be an advocate for HIV prevention and for caring and supportive attitudes in the community:

- o Encourage and support teachers and youth workers to reach out to young people, especially teenagers
- o Discourage sex and early marriage for very young girls

- o Encourage leaders in all sectors to take their share in spreading HIV/AIDS awareness. Sexual behaviour should be an important topic of discussion everywhere
- o Discourage the practice of wife inheritance

PREVENTION OF TRANSMISSION VIA INFECTED BLOOD AND NEEDLES

Safe practices in health clinics protect both patients and health workers.

1. Never use the same needle or syringe more than once
2. Develop a good disposal strategy for syringes, needles, and other “sharps” (see text box)
3. Wear gloves when operating, performing deliveries or handling wounds. Wear gloves when handling newborn infants until the child has been cleaned and dried
4. Goggles or plain glasses can help protect eyes against blood and other fluids
5. If hands get soiled with blood or other body fluids, wash immediately with soap and water
6. Cuts or abrasions on hands must be covered appropriately
7. Gloves, instruments, needles and linen for theatre and obstetrics should all be properly sterilised before using it for the next patient
8. For major operations wear double gloves, glasses, aprons and boots. For orthopaedic operations with sharp pieces of bone special strong woven gloves are recommended
9. Always test blood before transfusion

Safe disposal of syringes and needles

1. Make a good sharps container: use an old tin or jerry can with a small hole at the top, in which needles and lancets can be put. (Never use an open waste basket or a plastic bag!)
2. Never recap needles and never remove them with your hands. Either tip them off in the opening of the sharps container or remove them with a forceps then throw them away in the sharps container
3. The sharps container should never be too full, when almost full, close it and incinerate it. An alternative if the container is small is to throw it in the pit latrine. Burying alone is not safe as people/children might dig it up *Current UNICEF advice is to dig a 2 meter deep hole, put the sharps in, throw some kerosene or diesel over it and burn it the same day. After that put some sand over the debris*

PREVENTION OF MOTHER TO CHILD TRANSMISSION:

- If available offer couples counselling and testing (VCT); discuss family planning if one of the partners is positive
- Offer HIV counselling and testing to pregnant women.

For other interventions see chapters on ANC and obstetrics

6. FAMILY PLANNING AND CHILD SPACING

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6. FAMILY PLANNING AND CHILD SPACING

INTRODUCTION:

Maternal mortality can be reduced through skilled birth attendance at all deliveries, accessibility to emergency obstetrical care services and planned pregnancies. In this chapter, the various methods to help to space births in the family are discussed.

DEFINITIONS

Family planning (FP) is the means of helping an individual or a couple to decide for themselves when to start having children, how to space them, how many to have and when to stop having them.

Counselling in FP is the process of assisting a client to make voluntary and informed decisions on their contraceptive needs. It is a two-way exchange that involves listening to clients, informing them and allowing them to make a voluntary decision.

Types of family planning methods

There are two major types of family planning methods:

1. Natural or traditional
2. Artificial or modern methods

The Natural methods are based on fertility awareness:

- ◆ Cervical awareness method
- ◆ Basal body temperature
- ◆ Calendar (rhythm) method
- ◆ Lactational amenorrhoea method

The Artificial methods include **barrier/mechanical** and **hormonal** methods.

a) **Barrier/mechanical methods:**

- ◆ At the level of the vagina:
 - condoms both male and female
 - spermicides
 - cervical cap/diaphragm
- ◆ At the level of the uterus:
 - the Intra Uterine contraceptive Device (IUD)
- ◆ At the level of the fallopian tubes:
 - tube ligation / occlusion
- ◆ For men at the level of the male tubes
 - vasectomy

b) Hormonal methods:

- ◆ combined oral contraceptives
- ◆ progesterone-only oral contraceptives
- ◆ progesterone-only injectable contraceptive
- ◆ progesterone implants (Norplant)

INFORMATION ON COUNSELLING FOR THE VARIOUS METHODS:

1. THE NATURAL METHODS:

a. THE FERTILITY AWARENESS BASED METHODS

They work on the fact that the woman and her partner have sexual intercourse only during the time (safe period) when she cannot get pregnant. It is best used by a couple where the woman has a known and regular menstrual cycle; and where there are strong cultural / religious or medical restrictions to the use of other methods. The methods require a good knowledge of the menstrual cycle and the couple must be highly motivated and trained to use either of them. The method is efficient if used consistently and correctly. Spermatozoa are viable within the female reproductive system for up to four days and after ovulation the ovum is viable for up to 48 hours. Abstinence from sexual relations up to four days before ovulation and three days after ovulation is needed to avoid pregnancy.

b. LACTATION AMENORRHOEA METHOD (LAM)

LAM depends on three criteria to be reliable:

- ◆ **Exclusive breastfeeding**
- ◆ **Baby less than six months**
- ◆ **No return of menses**

Lactation prevents pregnancy because there is no production of eggs during this period. It is quite reliable for the first six month after a delivery if the baby is given exclusive breastfeeding: It is important that the lactating mother understands she should give no supplementary feeding at all before the age of six months, not even water, just breast feeding on demand.

It is recommended to breast feed for two years but a woman can only fully rely on the contraceptive effect during the first 6 months. The other advantages of breast feeding are described in the chapter about nutrition.

2. THE ARTIFICIAL METHODS

2.1 The vaginal barrier methods:

a. CONDOMS

Male and female condoms protect against sexually transmitted infections as well as pregnancy. They are usually made of latex (common) or polyurethane. Polyurethane is thinner and more sensitive but more expensive. Male condoms are widely available, female condoms only with a few providers.

Use:

- Use a new condom every time you have sex. Never use the same condom twice.
- Put the condom on after the penis is erect and before any contact is made between the penis and the female genital organs
- Leave 1 cm empty at the end of the condom. After ejaculation, pull out before the penis softens, and hold the condom against the base of the penis while you pull out, so that the semen doesn't spill
- Condom should be disposed properly. They are not toys for children. Used correctly, condoms are quite effective
- Do not use condoms from packets that have been damaged or are expired

b. SPERMICIDES

Spermicides are chemical products that inactivate or kill sperm to prevent pregnancy. They are available as a cream jelly, foam or foaming tablet to be inserted into the vagina before having sex. Some condoms are already lubricated with spermicides.

Use: After ejaculation the female has to wait for 3-6 hours before cleaning the vagina to allow time for action on the sperms.

Spermicides are inactive against HIV and other STIs. They should only be used by persons who are HIV negative because allergic reactions to the agents may facilitate HIV transmission. Condoms containing spermicidal agents should also not be used by HIV positive partners.

2.2 THE HORMONAL CONTRACEPTIVES

a. COMBINED ORAL CONTRACEPTIVES (COC):

Combination of Oestrogen and Progesterone

Mechanism of action: inhibits ovulation, causes the endometrium to be thin which prevents implantation in the uterus and favours thick cervical mucus which reduces the chances for fertilization

Effectiveness: up to 99.9% when correctly used. Failure rates are associated with user error, incomplete information, gastrointestinal upsets, drug interactions, expired pills, etc.

Advantages: It is easily reversible, it corrects irregular menstrual cycles and reduces anaemia from menstrual bleeding, It reduces menstrual pains. It can be used as emergency contraception

Disadvantages: It is not suitable for breastfeeding mothers during the first 6 months (reduces quality and quantity of milk); Pills need to be taken daily and regularly; it needs regular re-supply and gives no protection against STI/HIV transmission

Side effects: nausea, breast pain, headaches, acne, slight weight gain, spotting and amenorrhea. There is an increased cardiovascular risk in women above 35 years who are heavy smokers

Major contraindications: suspected or confirmed pregnancy, breastfeeding mother of a baby less than 6 months old, active liver disease, high blood pressure, diabetes mellitus, sickle cell disease, heart disease, undiagnosed breast mass, undiagnosed abnormal vaginal bleeding and gynaecological cancer

Presentation: packets of 28 tablets in the family planning clinic. There are 21 white tablets (FP) and 7 brown tablets (Iron)

Dosage: one tablet daily preferably taken at the same time of the day, starting within the first five days of the menstrual cycle. The COC can be started anytime of the cycle if it is ascertained that the client is not pregnant. If the client starts after the 5th day of the cycle, she should use condoms for one week to avoid pregnancy

In case of forgetfulness

- If you miss one white pill, take it immediately together with the regular pill for the day at the same time
- If you miss two or more white pills in a row, take one extra pill together with the pill for the day at the usual time Use a back-up method (condoms) for the next 7 days during sexual intercourse
- If you miss any of the last 7 brown pills do not worry. Skip the missed pill(s) and continue till the end of the packet
- If forgetfulness becomes habitual choose a different method

Follow-up should be within a month the first time (before the packet finishes), then at three months and later on every 6 months

b. PROGESTERONE-ONLY PILL

This avoids all the oestrogen side effects enumerated above.

Mechanism of action: It thickens the cervical mucus inhibiting ascension of sperms and it causes poor endometrium preventing implantation in the uterus

Effectiveness: more than 99% if used correctly. Must absolutely be taken at the same time daily since it is a micro-pill and the effectiveness is reduced considerably after 24 hours

Advantages: no effect on breast milk, no marked cardio-vascular effect

Disadvantages: amenorrhoea, spotting and irregular vaginal bleeding and no protection against STI/HIV prevention

Contraindications: undiagnosed abnormal vaginal bleeding, family history of breast cancer, uterine fibroids and liver disease

c. PROGESTERONE INJECTABLE CONTRACEPTIVE

Medroxyprogesterone acetate 150 mg/ml (Depo-Provera)

Mechanism of action: mainly by inhibiting ovulation, secondarily by creating thick cervical mucus secretions hostile to spermatozoa ascent and thinning of endometrium rendering it hostile to implantation

Dosage: Depo-Provera is administered every three months deep intramuscular either into the buttocks or the deltoid muscle. The site should not be rubbed or massaged

Advantages: efficiency of 99.9%, private and convenient, long term temporary contraception, can be used between 4 weeks and 6 months after birth in a breast feeding mother, decreased risk of endometrial cancer

Side effects: amenorrhoea, spotting or heavy vaginal bleeding, slight weight gain and decreased libido

Contra-indications: breast and gynaecological cancers, diabetes, uncontrolled hypertension and null parity

Follow up: Clients must return regularly every 2 or 3 months for further injections and whenever there are major side effects

d. EMERGENCY CONTRACEPTION

Indicated in cases of unprotected sexual intercourse during the fertile/unsafe period of the menstrual cycle e.g. by sexual assault. It is also known as the morning-after-pill.

Mechanism of action: either fertilisation will be inhibited or implantation does not take place. The usage must start within 72 hours of the intercourse.

Recommended pills: Levonorgestrel 750 microgram one tablet orally as soon as possible, to be repeated after 12 hours. Menstrual period can be expected up to 21 days from the ingestion of the pills.

The IUD (intrauterine device) can also be used as an emergency method of contraception. The IUD must be fitted by a trained doctor / midwife, within five days of having sex for it to be effective,

2.4 THE INTRA UTERINE DEVICE (IUD)

It is a small device usually made of plastic or plastic and copper. A trained health care worker places the IUD in the woman's uterus. The most commonly used IUD, the Copper T380-A, can be left in place for 10 years.

Mechanism of action: An IUD prevents the sperm from meeting the egg. The physical presence of the IUD, keeps the sperm from moving normally inside the uterus and fallopian tubes

Service provision: The IUD is presented in a sterile package and must be inserted and removed by a trained IUD service provider

Advantages: long term contraceptive, alternative for sterilization, easily reversible, highly effective 96, 5%, a non-hormonal method, suitable for breast feeding mothers

Disadvantages: requires specialized services for insertion; abdominal cramps following insertion increased menstrual bleeding

Complications (not related to a faulty insertion): upward migration of string into uterus/uterine muscle/ abdominal cavity, lost strings, pregnancy with IUD in situ and ascending infection with IUD. These complications have warning signs which should be looked out for and the client should be advised to report immediately to the health facility on noticing them. The woman should check regularly if the strings are in place and report any unusual abdominal pain or discharge

Contraindications: null parity, multiple partners, uterine malformation, severe hypertension, and heart disease.

2.4 STERILIZATION

The operation for a woman is called tubal ligation, for a man vasectomy. Sterilisation is different from castration because it does not remove the genital organs but just blocks the tubes through which the eggs/ sperms travel. The intervention is still culturally sensitive. It must be stressed that it will have no effect on libido or sexual performance. Before the intervention there must be a written consent from the male and female partner; other family members cannot sign. Sterilisation is a permanent, irreversible method recommended for reasons like completed family, severe medical disease including hypertension or heart failure, or multiple caesarean sections.

Effectiveness: at least 99%.

Method: It requires a skilled surgeon and an operation theatre setting with staff and sterile equipment. The methods include occlusion with clips or ligation with or without removing a small part of the tube. In women it is a small abdominal operation, in men the operation is carried out on the vas deferens just under the skin of the scrotum.

Risk factors for regret

- Method carried out under duress (e.g. secondary to an emergency C/S)
- Young age of female partner
- Unstable union
- Same sex children or only one child of a desired sex
- Few children

In these cases provide extra counselling or advise another reversible method.

Other risks: In women: ectopic pregnancy. Therefore in the event of a missed period after tubal ligation, the client should immediately report to the health facility to rule out an ectopic pregnancy.

7. NUTRITION AND BREASTFEEDING

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7. NUTRITION AND BREASTFEEDING

INTRODUCTION

Nutritional needs of people differ according to age, illness or pregnancy, sex and physical activity level. In this chapter we will mainly concentrate on the nutrition of pregnant women and young children. But obviously children need enough food of different variety as long as they are growing.

For a child to reach his/her full potential in life, he/she needs good food from the time of conception. In the treatment chapters we will pay some attention to special needs of other groups, like people with hypertension, diabetes, HIV/AIDS or other terminal diseases.

7.1. NUTRITION BEFORE AND DURING PREGNANCY

A woman should start her pregnancy in a good condition; she should not be younger than 18 and not older than 40. The time since her last delivery should be preferably 2 years or more and she should not be anaemic /malnourished or otherwise ill.

To ensure that a baby gets enough food in the womb the mother needs to eat nutritious foods and eat more than normal. On average a mother should gain 8 to 10 kilo during her pregnancy. She can and should eat all normal foods. Lack of certain micronutrients like Iron or Iodine, can affect the baby negatively. The only taboos during pregnancy are alcohol, smoking and certain medicines. So always ask a woman if she is pregnant before you prescribe medicines to her.

If adolescent girls (less than 18 years) become pregnant they need special care and knowledge to ensure that they eat much more and nutritious diet because they need additional nutrients for the growth of both the baby and themselves. Enough rest has a positive influence on the growth of the baby; the mother can do normal work but should not do excessive labour.

7.2. BREAST FEEDING

The mother's milk is the best food for the baby; it is free, clean, has the right temperature, the right nutrients for the baby, contains antibodies and increases bonding between mother and child.

Breast feeding should start as soon as possible after birth, preferably within the first hour. It also benefits the mother: it helps the uterus to contract and reduces bleeding. The child should never be separated from the mother and not be given other food or fluids. The more the baby sucks the more milk the mother will produce.

For the first six months of the baby's life mother's milk is enough for all his/her needs. This means the baby should only get breast milk, not even additional water. During this period the mother needs extra food and rest, as the baby grows she has to produce up to one litre of milk per day and this takes a large amount of energy. Breast feeding should ideally continue for 24 months.

Common problems during breast feeding can be overcome by following good advice. This is a priority area: in poverty situations, without breast feeding many children will be at risk of dying.

Problem	Action
Baby does not suck well. This can be due to pre-maturity, birth injury, severe infection., congenital abnormalities, e.g. cleft palate	Express milk from the breast and feed with a spoon. If the baby does not drink enough milk this way, then he/she needs a naso-gastric tube
Mother's milk is not enough, e.g. in case of twins	Encourage the mother to eat and rest more and breast feed both. Earlier introduction of extra feeds might be needed
Hard swelling of the breast (after delivery)	Disappears if the baby can grasp the nipple and suck. Good position and gentle massage of the area around the nipple can help
Cracked nipples	Express the milk by hand and feed the child with cup and spoon. Put gentian violet on the cracks until they heal
Mastitis (and abscess)	Express the milk gently every 4 hours on the affected side. Let the baby suck from the other breast. Give the mother Amoxicillin and painkillers. If an abscess has formed, incision is probably needed
Inverted or flat nipples	Needs to be addressed during ANC. Teach mother to pull the nipple out at least twice a day
Worry / lack of confidence	Stimulate milk secretion by having the baby suck more often. Encourage the mother
Wrong beliefs	Mother's milk can not be "bad". A special note has to be made for mothers who are proven HIV +ve there is a chance that the infection can be transmitted to the baby. More about this in the chapter about HIV (5)

7.3 INTRODUCING WEANING FOODS:

If the baby is growing well and satisfied after breast feeding it is good and safe to wait with introducing foods until he / she is six months old. Introduce new foods one at a time and increase slowly. (Only HIV positive mothers have to wean abruptly. See chapter 5). The food should be given before breast feeding, when the child is still hungry.

The type of food given depends on what is available, but it has to be soft or mashed. Mashed bananas or porridge are good starters. Always give with a spoon, never use a bottle! (It is difficult to clean adequately)

After a few weeks start enriching the porridge with some food containing fat and protein, like ground-nut sauce, mince meat or fish. Then add fruits or vegetables to at least one meal. Gradually increase the number of meals to 4 to 5 feedings by the time the child is 9 months old. While introducing weaning foods, the mother should continue to breastfeed!

Always remember a child has a small stomach and cannot eat enough in 2 or 3 meals a day, he needs more frequent feeding. Mixed feeds are better than meals with one type of food. Add oil or fat in small amounts to soften the mix and increase energy.

As the infant grows he/she can eat more of the family food, but still needs frequent feeding. At the age of two years breast feeding can be stopped. Never stop abruptly, slowly reduce the number of feeds. Regular growth monitoring in the clinic or during EPI can give early warning when a child is not growing well and you can advise the mother accordingly.

7.4 GROWTH MONITORING

To guarantee proper growth it is important to monitor the growth of the child regularly and advice the mother accordingly.

- The best method to monitor the growth of a child is to record the weight of the child regularly on the Road to Health Chart. This Chart / graph can be found on the EPI card. In the first year this can be done during EPI. The vaccinators have to learn about weighing and recording and diagnosing when the child is not growing properly. In that case they should refer to the MCHW (Mother and Child Health Worker) to exclude disease and advice on feeding. After the first year the child has to come directly to the Unit for growth monitoring and Vitamin A supplement on a regular basis

- Unfortunately there are many children who do not receive EPI or they are not weighed during the sessions therefore for every child that comes into the Unit:
 - o Ask the mother /care taker for his/her Road to Health Chart
 - o If she does not have it, make one
 - o Weigh the child and record weight on the chart
 - o Advice mother / caretaker on the importance of keeping the card clean and safe (sealed in a plastic bag if possible to protect from water and dirt) and to carry it every time she takes her child to visit a health facility
 - o Do a mid upper arm circumference (MUAC). This is a quick measurement of the nutrition status of the child. If the MUAC strip shows yellow, the child is moderately malnourished and is at risk of deterioration unless the cause of the problem is established and addressed. In that case refer the mother for nutrition counselling /education and further management to the MCHW. If the MUAC shows red it means severe malnutrition and the child should be admitted into the PHCC.
 - o Check for bilateral oedema. A child with pitting bilateral oedema is severely malnourished even when his/her weight reads well. Admit the child or refer to hospital
 - o Check for pallor indicating anaemia which will need investigation and treatment

7.5. VITAMIN A SUPPLEMENTATION

In the first year Vitamin A supplementation can be given during EPI sessions. After this it should be organised in the PHCU / PHCC so that children get Vitamin A every 6 months until they are 5 years old. See schedule below:

Vitamin A supplementation schedule

Dosage (in IU)		When to give
< 6 months	50.000 units	First dose at 3 months if the child is not breastfed. If the child is breast fed, first dose at 9 months then every 6 months (twice per year) up to the age of 5 years
6-12 months	100.000 units	
> 12 months	200.000 units	

For every child under 5 seen at the clinic (either ill or healthy):

1. Make sure the child has or gets a Road to Health chart and record the weight of that day
2. If there is no growth chart: do a MUAC to assess the current nutritional status
3. Check if the immunisations are up to date, if not take action
4. Give Vitamin A if last dose was more than 6 months ago and record it
5. Give health education

7.5 NUTRITION AND ILLNESS

Nutrition and illness influence each other. If children are ill often they will eat less and become weaker and will have less resistance against disease and fall ill again, etc. With each infection the child takes a step further towards malnutrition. This is called a downward spiral and it has to be interrupted. Therefore when a child is ill continue to breast feed and give frequent easily digestible meals. After a period of illness, especially measles or diarrhoea the child needs a prolonged period of extra food to catch up on his growth. In the wards prevent overcrowding so that children do not cross infect each other.

7.6 TOO MUCH NUTRITION / OBESITY

This is not yet a common problem in Southern Sudan. Worldwide though, it is becoming a major problem. If children or adults eat too much and especially too much sugar and fat and in addition are not very active they become obese. Obese children often turn into obese adults. Obesity has its own risks and complications, like diabetes, hypertension, stroke, etc. More food is not necessarily better, there has to be a balance between food intake and activity. The same is true for adults. Disease like diabetes and hypertension can often be controlled by proper diet, losing weight and regular exercise.

8. ACCIDENTS AND INJURIES

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8. ACCIDENTS AND INJURIES

Many accidents and injuries happen in and around the house and often they can be prevented. Some common accidents are discussed in this chapter.

8.1 BURNS

Burns are often seen in young children, either caused by direct fire or by hot fluids. In many compounds children have easy access to fire or cooking pots; often the mother is too busy to watch children at all times. Another group at risk are people with epilepsy; never let them stay near a fire unsupervised.

Solutions are not easy. Sometimes it is possible to raise the cooking stove, but even then it is possible that a toddler will grab the handle of a cooking pot and get hot food over his head. Another option is to fence the cooking area. Burns are terrible traumas that result in scars for life. Think about prevention!!

A big danger for all age groups is also the burning of bushes on a large scale. Every year it claims many victims. Let the bush burning be done by experienced people and keep children away.

8.2 POISONING

Too often children accidentally drink kerosene, insecticides or swallow some tablets that are within reach. This should be avoided and precaution taken to prevent such accidents.

- Never keep insecticides, kerosene etc in a place where small children can reach them
- Never keep poisons in cola or other drinking bottles; even older children may mistake them for a soft drink and one sip can do major damage
- Keep all medicines out of reach of children. Put them in a plastic bag and hang them high on a pin in the house
- It is even better to keep all poisons and medicines locked up, as even teenagers can at times be unstable and in the heat of a moment swallow some drugs or poison, either to get attention or as a suicide attempt

8.3. TRAFFIC ACCIDENTS

Until now there is not much traffic in Southern Sudan and therefore not many accidents. This also means that children are not aware of the dangers of vehicles. Never let children play on the main road, even if there is little traffic. The same goes for train tracks that will be restored in the near future.

8.4. DROWNING

Many people in Southern Sudan live near rivers, and these often fluctuate in size during the seasons. When the rivers are high the current can be very tricky. Therefore, if people live close to rivers they have two options:

- Instil in children a proper fear of the dangers of water, so that they will stay away from the rivers
- If they have to go near the water, teach them how to swim
- Never allow toddlers unsupervised near the water
- The same goes for people with epilepsy

8.5. PITS, HOLES AND LATRINES

Make sure they are all properly covered or fenced, so that small children cannot fall in accidentally.

8.6. WEAPONS AND LANDMINES

In some areas there will be landmines for years to come, and some of the main victims are women and children who are working in the field.

- Explain to children at home and in school about land mines and that they should never touch suspect objects but should warn an adult
- As a community try to get your area cleared of landmines
- If there are children do not keep weapons in the same house. If people do need to keep them they should be locked up and unloaded. Never let children play with guns, not even unloaded ones

8.7. DOG BITES AND BATS

Dogs and bats are the main sources of rabies, a very dangerous disease. Rabies is transmitted from humans to animals via the bite of an infected animal. To prevent this:

- all dogs owned by people must be vaccinated against rabies (discuss with the veterinary department)
- Put down / vaccinate all stray dogs
- Eliminate hoards of bats
- If a person is bitten try to catch the dog and watch his behaviour
- If the animal is suspected for rabies refer the person for vaccination immediately

8.8. NON ACCIDENTAL INJURIES

People can injure each other deliberately during a fight. There are two factors that can escalate a fight.

- Possession of arms
- Alcohol abuse

The combination of both is worse. Try to discourage both.

8.9. WIFE OR CHILD ABUSE AND NEGLECT

Most abuse happens at home in the family. Wife beating and child abuse are present in every society. If you see mothers or children with unexplained injuries always consider the possibilities of abuse and encourage them to talk about it. Try to address the situation, if needed through the church or community leaders. Discourage the use of physical child punishment both at home and in schools. There are other ways to discipline children.

Child abuse or neglect is more common in the following high risk situations:

- Poverty, resulting in parents not able to feed their children
- Social isolation of the family
- Single mothers / Unplanned / Teenage parenthood
- Children with a mental or physical handicap
- Mothers with a psychiatric illness
- Alcoholism / Broken families

Remember that most of these situations are more common in a situation of war and displacement. Both parents and children in these high risk families need support from the health worker and the community.

8.10. EDUCATE THE CHILD

The best protection for life parents can give to their children is probably an education. Encourage both sons and daughters to attend school. It will increase their knowledge about health, hygiene, and nutrition and help them to raise their children properly. Education includes knowledge about sexual health, pregnancy and HIV/AIDS. Young girls need to be equipped with the knowledge and the confidence to say no to sex if they want to.

9. WATER AND SANITATION

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9. WATER AND SANITATION

Many infections can be prevented by good hygiene and proper sanitation.

9.1. PERSONAL HYGIENE

- Wash hands with soap or ash and water after visiting a latrine
- Wash hands with soap or ash and water after cleaning a child's bottom
- Wash your hands before handling food
- Wash your face and especially children's faces at least once a day. Dirty faces and flies cause trachoma and blindness
- Regular washing of the body helps to prevent skin diseases

9.2. FOOD PREPARATION

- Cooking should take place in a separate area in the household,
- The kitchen area should be kept clean, tidy and away from animals
- Food should be stored in covered containers and utensils should be stored on shelves (not the floor)
- Raw food such as fruit and vegetables should be washed or cooked. Cooked food should be eaten as soon as possible

9.3. WATER STORAGE

- Collect water if possible from a protected water source
- If this is not possible drinking water can be boiled and filtered and stored in a clean container with a lid
- If there is no way of filtering / boiling put the water in a transparent plastic bottle and leave it in the sun for about 8 hours. The roof is a good place. This kills about 99% of the bacteria
- Another possibility is to add a few drops of Sodium hypochlorite 1.2% (Waterguard) according to instructions on the bottle or use Chlorine tablets for disinfection
- Drinking water should be kept separate from washing water and scooping utensils should be clean

9.4. USE OF LATRINES / BURYING STOOLS

- A well built latrine at a good distance from the water supply reduces spread of diarrhoea
- Keep the latrines clean
- Teach young children how to use a latrine properly
- Dispose of babies' faeces also in the latrine
- If there is no latrine available people should bury the stools far from houses and water sources

9.5. WATER RELATED DISEASES

9.5.1. GUINEA WORM

Guinea worm (*Dracunculus medinensis*) is the largest filarial worm afflicting humans; People get infected by swallowing small larvae in contaminated water. The larva develops into a worm which ruptures the skin and discharges larvae on immersion in water. If another person drinks from this water he/she will get infected and the cycle is complete.

The disease is associated with lack of clean water supply. It is often seasonal in transmission, during the dry season people have to rely on contaminated surface water such as ponds and puddles. Any water supply that people stand in while collecting water is a danger.

Prevention

- Teach people to sieve drinking water using a guinea worm cloth filter or pipe filter (both provided free)
- People with an emerged guinea worm (an open wound at the place of the head of the guinea worm) should not step into water sources
- A chemical Abate can be used to clear the whole water source of guinea worm but is not widely used
- The long term solution to the problem is a safe water supply

Treatment

- Once the worm has partly emerged, the only way to remove it is by rolling it around a small stick every day until the whole worm comes out. If it breaks there is danger of having a nasty infection
- The patient must be seen within 24 hours by a health worker / guinea worm volunteer, who will:
 - Dress the wound and provide painkillers
 - Advice on how to pull the worm out
 - Advice patient not to put the wound in a water source

FILTER YOUR WATER. STOP GUINEA WORM
--

9.5.2. TRACHOMA

Trachoma is the world's leading cause of preventable blindness. . It is common in Upper Nile and Equatoria region. Trachoma is a contagious, chronic inflammation of the conjunctivae of the eyes.

Cause

- It is caused by Chlamydia trachomatis. It has an incubation period of 5 to 12 days and begins slowly as conjunctivitis which if untreated may become chronic and lead to scarring
- If the eyelids are severely irritated and scarred, the eyelashes may turn in and rub against the cornea. This can cause eye ulcers, further scarring, visual loss, and even blindness

The Groups at risk are:

- It frequently affects children even though the consequences of scarring may not be evident until later. Poverty, crowded living conditions, and/or poor hygiene are risk factors
- Women are three times more likely to go blind from trachoma than men, probably due to their frequent contact with children

Modes of transmission

Trachoma is acquired via direct contact with eye or nose-throat secretions from affected individuals or by contact with contaminated objects like towels or clothes. In addition, certain flies that have fed on these secretions can transmit the disease.

Prevention

Communities can prevent trachoma and its transmission by:

- o Controlling environmental changes, such as better access to water and improved sanitation
- o Regular face washing, especially in children
- o Reduce the fly population, by proper garbage disposal and keeping cattle separate from children
- o Early treatment with Tetracycline eye ointment and/or Azithromycin. In areas with a high prevalence regular mass treatment with Azithromycin is recommended
- o Preventing blindness by seeking surgery as soon as possible, especially for people with in turned eyelashes. For symptoms and treatment see chapter on eye diseases

STOP TRACHOMA. STOP BLINDNESS

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10. PREVENTION OF ORAL DISEASES

INTRODUCTION

Oral or Dental diseases have been referred to as “the neglected epidemic”, because of the large percentage of the population affected and the high rate of new disease each year. The “neglect” may be due to the non-life threat of the diseases (except the cancers) or poor competition for resources. However policy makers and service providers should develop a preventive philosophy, firstly because the main oral diseases are lifestyle linked and can be prevented and secondly in order to minimize the physical, social and economic impact of oral diseases.

PREVENTIVE STRATEGIES

Effective prevention strategies require knowledge of the causes of the disease. Through oral health education, health promotional activities and prompt treatment these factors can be modified to prevent occurrence or progression of dental disease. The main diseases to be prevented in oral health are caries and gingivitis/ peri-dontitis. Caries develops holes in the teeth, gingivitis and peri-dontitis are infections occurring in the soft tissues around the teeth. Both diseases are caused by bacteria that survive in the plaque in the mouth and thrive on sugar.

1. PREVENTION OF CARIES

PRIMARY PREVENTION OF CARIES

This should be done at community level. It involves health education and oral health promotion aimed at changing beliefs, attitudes and behaviour:

1. The single most important factor in the cause of caries is frequency of sugar consumption. The more often a person eats sugar the longer the mouth stays acidic which favours caries formation. Therefore encourage children not to eat any sugar between mealtimes.
2. At the same time topical fluorides in toothpastes play a major role in the prevention of caries.
3. Early and regular utilisation of dental services.

SECONDARY PREVENTION OF CARIES

The goal is early detection and intervention to avoid progression. This can be done by combining community and individual approaches, but mainly the community approach.

It involves the following:

- Screen at risk populations, mostly children and adolescents who can usually be found in schools
- Screening should detect deep and retentive fissures, and treatable cavities
- Render the deep fissures less deep by placement of fissure sealants or by grinding
- At individual level: check all teeth and make a treatment plan

TERTIARY PREVENTION

Refer to a dentist.

2. PREVENTION OF PERIODONTAL DISEASE

PRIMARY PREVENTION OF PERIODONTAL DISEASE

Periodontal disease can be classified into gingivitis and peri-dontitis. The primary cause is toxins produced by bacteria found in dental plaque. Although plaque is part of the natural environment of the teeth, it becomes harmful if left to accumulate without cleaning for more than two days. The bacteria multiply and cause inflammation of the gums called gingivitis. There are other risk factors for peri-dontal disease for example poor oral hygiene, smoking, compromised immunity (diabetes, HIV/AIDS).

Strategy

Promote health education at community level. It should aim at changing oral hygiene habits and to reduce the risk factors. Children should be taught to clean their teeth as part of daily hygiene. This can be done at home, in school or through the media.

SECONDARY PREVENTION OF PERIODONTAL DISEASE

In the case of gingivitis the primary factor is accumulated plaque. This should be cleaned off by a dental assistant. After the prophylactic treatment it is extremely important to give oral hygiene instructions, asking the patient to clean the teeth morning and evening daily. Point out that cleaning must continue even when the gums bleed during the action.

In case of peri-dontitis scaling and polishing should be done by a dental assistant. This should be followed with antibiotic treatment and oral hygiene instructions as above.

TERTIARY PREVENTION

Refer to a Dentist.

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1. PAEDIATRIC CONDITIONS

This chapter deals with common diseases in children. Other paediatric diseases can be found elsewhere. E.g. malaria is in the chapter malaria and meningitis in the chapter on neurology.

GENERAL REMARKS ON TREATMENT OF CHILDREN

1. In children supportive measures are often as important as medicines:
 - Hydration: A child easily gets dehydrated. Make sure the child gets enough fluids, especially if there is diarrhoea and vomiting
 - Nutrition: A child quickly gets a low blood sugar level. Make sure the child gets regular amounts of calories. When a child is malnourished address nutrition as well as current illness. Weigh each child that gets admitted and do a MUAC (mid upper arm circumference). Note both on the chart. Calculate weight for height if you are able to.
 - Temperature: It is difficult for a child to control body temperature. Make sure the child doesn't get too cold by covering him or her up well; on the other hand if the child has a high fever remove warm wrapping and give paracetamol. Sponge the child if the fever is very high
 - Psychological comfort: A child easily feels threatened in a strange situation. Leave the child with the mother as much as possible. With an older child, talk to the child.
2. Give medicines, especially antibiotics, in the appropriate dosage and for the appropriate duration. The dosage is best calculated according to body weight. If weighing is not possible, calculate according to age.
3. Give oral medicines if a child is not vomiting and not very ill. Even if a child needs injections initially, change to oral medication as soon as possible.
4. It is not necessary to treat every sick child with antibiotics. A child under five has on average five respiratory infections per year. Mostly it is a common cold or virus and antibiotics are not required. Diarrhoea can mostly be treated with extra fluids only.
5. Explain the condition and treatment to the mother. Assure the mother that she can come back whenever the child gets worse.
6. Always check for general danger signs. A child with one or more danger signs is severely ill and needs urgent attention. Check on your waiting patients regularly and see severely ill children first.

General danger signs

- The child is unable to drink or breastfeed
- The child has convulsions
- The child is abnormally sleepy or difficult to wake

1.2 ACUTE RESPIRATORY INFECTIONS (ARI)

ARI's include upper and lower respiratory tract infections as well as problems of the ear, nose and throat. The treatment in this chapter is for children over 2 months old. For newborns see chapter neonatology.

GENERAL REMARKS

1. Check for any general danger signs (see box above).
If fever is present, do a malaria test. If a malaria test is not available or the child is under five treat as malaria with Artesunate / Amodiaquine
2. Do not use antihistamines or cough syrups, as they have no effect on length or severity of the illness and can make some children worse. If the child has a sore throat or an irritating cough, give honey and extra fluids
3. Most ARI's are caused by viruses and do not need antibiotics
4. Pneumonia is diagnosed by fast breathing and / or difficulty in breathing

SIGNS OF PNEUMONIA OR VERY SEVERE DISEASE:

- **Fast breathing:** The child breathes faster than normal for its age. To measure the respiratory rate (RR) of a child, count how many times a child is breathing per minute. A child is breathing fast if the RR is higher than the cut off point according to age in the table below
- **Chest in-drawings:** The child breathes with effort: the spaces between the rib, the lower chest wall and the hollows above the clavicles are drawn in during inspiration
- **Grunting:** The child makes a soft low sound when breathing out
- **Nose flaring:** The sides of the child's nose move up and down during breathing
- **Stridor:** There is a hoarse wheezing sound on inspiration (This is not a sign of pneumonia but is most common with viral croup or epiglottitis)

Fast breathing and difficulty in breathing is mostly a sign of pneumonia but at times can also be present in other severe illnesses like cerebral malaria, meningitis, severe anaemia, heart diseases, and intoxications. It always means the child is severely ill.

Fast breathing:

Age	Fast breathing (RR)
< 2 months	> 60 breaths per minute
2 – 12 months	> 50 breaths per minute
1 – 5 years	> 40 breaths per minute
Over 5 years	> 30 breaths per minute

Diagnosis

Signs	Classify as
Fast breathing plus Any general danger signs Or Chest in-drawing / nasal flaring Or Stridor in a calm child Or Grunting / cyanosis	Severe pneumonia (Or very severe other disease)
Fast breathing (see box)	Pneumonia
No signs of pneumonia, fast breathing or of very severe disease	Common Cold / Cough

1.1.1. SEVERE PNEUMONIA

The child has fast breathing as well as difficulty in breathing. A child with a severe pneumonia needs to be admitted to hospital or PHCC. First doses of treatment should be given in the PHCU.

PHCC / Hospital:General measures:

- Admit the child
- Give paracetamol every 6 hours
- Give oxygen if needed

Antibiotics:

- Give Ampicillin every 6 hours IV / IM until the child improves (is fever free and respiratory rate decreases) then change to oral Amoxicillin
- If the child is very severely ill or if there is no improvement after 24 hours: add Gentamycin IM once daily

- Fluids / Feeding:
- Continue breast feeding
- If the child is not able to swallow give an NG tube and give breast milk up to 100 ml/kg/24 hours (small frequent feeds)

Further management:

- If there is no improvement or if the condition deteriorates consider malaria or meningitis and/or change to IV drugs.

Drug	HF	Paediatric dose	Frequency	Duration
Ampicillin 500 mg inj IM/IV 15-25 mg/kg Severe:25mg/kg	U	3 - 5 kg = 75mg 6 - 14 kg = 200 mg 15-30kg = 400 mg	4 times daily	Until child can take oral Amoxicillin
Gentamicin IM/IV 40 mg/ml 7.5mg/kg	C/H	4 kg = 30 mg 5 - 6 kg = 45 mg 7 - 8 kg = 60 mg 9 - 10 kg = 75 mg	Once daily	7-10 days
Amoxicillin 250 mg tablets 16 mg/kg	U	4 - 10 kg = 125 mg 10-19 kg = 250 mg	3 times daily	Complete 10 days
Paracetamol 120 mg tablets 500 mg tablets 10mg/kg	U	4 - 14 kg = 120 mg 14-19 kg = 250 mg	3-4 times daily	2 or 3 days

1.1.2. PNEUMONIA

The child has a fast breathing but no obvious signs of other difficulty in breathing.

PHCC:

General measures:

- Give paracetamol
- If the nose is blocked, put some drops of salt water in each nostril

Antibiotics:

- Give Amoxicillin
- If the Respiratory Rate (RR) is very high or the child is vomiting consider giving Ampicillin for 24 hours, then change to Amoxicillin when the child is able to take orally

Fluids /feeding:

- Continue breast feeding and /or other fluids; it is very important to maintain hydration
- Give easy-to-digest food in small amounts when the child is improving

Further management:

- Ask for the child to come back the next day or earlier if:
 - o Breathing gets more difficult
 - o Drinking gets more difficult
 - o The RR goes up

Drug	HF	Paediatric dose	Frequency	Duration
Ampicillin 500 mg inj 15-25 mg/kg	U	3 - 5 kg = 75mg 6 -14 kg =200mg 15-30kg =400mg	4 times daily	Until child can take oral Amoxicillin
Amoxicillin 250 mg tablets 16mg/kg	U	4 -10 kg = 125mg 10 -19 kg = 250mg	3 times daily	Complete 10 days
Paracetamol 120 mg tablets 10mg/kg	U	4 -14 kg = 120mg 14 -19 kg = 250mg	3-4 times daily	2 or 3 days

1.1.3. COUGH / COMMONCOLD

This is a viral infection, so no antibiotics are needed. Antihistamines and cough mixtures are also not needed.

General measures:

- If the nose is blocked, put some drops of salt water in each nostril
- Give Paracetamol if required
- For cough and sore throat honey or other home remedies can be used. (Do not use honey in children less than 1 year of age)

Antibiotics:

- No antibiotics are needed

Fluids / feeding:

- Continue breast feeding
- Give plenty of fluids
- Give easy-to-digest frequent meals

Further management:

- Advise the mother to return if :
 - The breathing becomes fast or more difficult
 - The child is unable to drink
 - The child becomes more ill
 - A fever lasts more than 2 days

If the child is not better after one week, and the nasal discharge becomes thick and pussy, accompanied by fever at night:

- Give Cotrimoxazole
- If a cough lasts more than 3 weeks: refer to exclude TB

Drug	HF	Paediatric dose	Frequency	Duration
Paracetamol 120 mg tablets 10 mg/kg	U	4 -14 kg = 120 mg 14 -25 kg = 240 mg	3-4 times daily	2 or 3 days
Cotrimoxazole 120 mg tablets 24 mg/kg	U	4 - 6 kg = 120 mg 6 - 14 kg = 240mg 14 - 25 kg = 360mg	2 times daily	5 days

1.1.4. WHEEZING

Wheezing is a collection of high musical sounds during expiration. It indicates a general spasm or obstruction of the bronchial tree. Cause and management depend on the age of the child.

PHCC / Hospital:

- ❖ In an infant **under 1 year**, if wheezing is accompanied by fast breathing and / or chest in-drawing:

Consider Bronchiolitis

Acute inflammatory obstructive disease of small airways (bronchioles) is common in children between 3 months and 1 year.

The origin is mostly viral but secondary bacterial infection can develop.

Clinical features:

- Mainly in infants
- Sudden onset
- Fever
- Cough
- Difficulty in breathing, wheezing
- Clear to mucoid nasal discharge

Management:

If severe and /or suspicion of secondary infection (wheezing, RR>60, cyanosis)

General measures:

- Admit the child
- Give Paracetamol if needed
- Give Oxygen

Antibiotics:

- Start Ampicillin IM or IV
- If the child is severely ill: add Gentamycin IM or IV

Further management:

- Give Salbutamol, but this is often not effective below 1 year
- If severely ill give Hydrocortisone 100 mg IV / IM

❖ **In children over 1 year:**

Wheezing is most likely due to asthma, see under asthma

Drug	HF	Paediatric dose	Freq.	Duration
Ampicillin 500 mg inj 15-25mg/kg	U	3 - 5 kg =75mg 6 -14 kg =200mg 15-30kg = 400mg	4 times daily	Until child can take oral Amoxicillin
Gentamicin IM 40 mg/ml 7.5mg/kg	C/H	4 kg = 30 mg 6 kg = 45 mg 8 kg = 60 mg 10 kg = 75 mg	Once daily	7-10 days
Salbutamol 4 mg tabs 0.1-0.15/kg	C/H	6 - 10 kg = 1mg 10 - 14 kg = 1.5 mg 15 - 20 kg = 2 mg	3 times daily	Continue for 2 days after the wheezing stopped
Hydrocortisone IM 100 mg inj 10mg/kg	C/H	<6 kg = 50 mg >6 kg = 100 mg	Once	-
Salbutamol inhaler 100mcg	C/H	100mcg (1 puff) Increased to 200mcg if necessary	Daily	Until wheezing stops

1.1.5. STRIDOR

Stridor is a harsh noise made during inspiration. If there is no history of inhalation of a foreign body it is probably caused by infection. In mild croup there is Stridor only when the child is upset and not at rest. Stridor at rest accompanied by chest in-drawings and/or fast breathing, are signs of severe croup. This is an emergency.

MILD CROUP

General management

- Do not examine the throat
- Re-assure mother and child

Antibiotics

- Do not give antibiotics

Fluids /feeding:

- Continue breast feeding
- Give plenty of fluids

Further management:

- If Stridor and dyspnoea increase, refer the child

Severe croup:

General management

- Admit the child, keep close to the mother
- Keep the child in a comfortable position
- Do not examine the throat
- Give Hydrocortisone IV
- Give Paracetamol if the child can swallow, otherwise tepid sponge for the fever

Antibiotics

- Give Chloramphenicol and Cloxacillin IV

Fluids / Feeding:

- If the child is restless/ dyspnoeic and refuses breast feeding, give IV fluids until there is improvement

Further management

- If very severe chest in-drawings, poor air entry, restlessness and pallor, intubation or tracheostomy may be required and the child should be referred to higher level.

Drug	HF	Paediatric dose	Freq	
Chloramphenicol IV 1Gm / vial 12.5mg/kg/dose	H	3 - 4 kg = 50 mg 5 - 6 kg = 75 mg 7 - 8 kg = 100 mg 9 - 10 kg = 125 mg 11 – 16kg = 200 mg 17 – 20kg = 250 mg	4 times daily	7days
Cloxacillin IV 500 mg/vial 12.5mg/kg/dose	H	3 - 4 kg = 50 mg 5- 6kg = 75 mg 7 - 8 kg = 100 mg 9 - 10 kg = 125 mg 11- 16 kg = 200 mg 17- 20 kg = 250 mg	4 times daily	7 days
Hydrocortisone IV 100 mg / vial 10mg/ kg	H	>5 kg = 100 mg >15 kg = 200 mg	One dose	-

1.1.6. PERTUSSIS (WHOOPIING COUGH)

Whooping cough is caused by bacteria and is characterised by a long period of noisy coughing attacks and often accompanied by vomiting. It can last for months. It is most dangerous in young infants as they may stop breathing. Coughing is in spasms with no breath taken between each cough and each spasm followed by the whoop of a long indrawn breath. The cough may be so violent as to cause haemorrhages especially sub-conjunctival. In infants under six months the classic cough and “whoop” may not occur and may be replaced by an apnoeic attack where the baby stops breathing for a short time.

General Management

- Heavy sedation is contraindicated but low doses of Promethazine can be helpful to reduce vomiting in children older than 2 years

Antibiotics

- Erythromycin is helpful for the patient, but only if given early in the infection. If given later in the infection it may decrease the spread to others but the cough still lasts a long time

Feeding:

- Give small frequent, easily digestible foods

NB. Always ask mothers about younger siblings of children with whooping cough, as young babies are at highest risk of dying of whooping cough.

Remember that this disease can be prevented by immunisation.

Drug	HF	Paediatric dose	Frequency	Duration
Erythromycin PO 12.5mg/kg/dose	U	<12 kg = 125 mg >12 kg = 250 mg	4 times daily	7 days
Promethazine 25mg tablet 0.3mg/kg	U	<2yrs: do not give 2 - 5 yrs = 5 mg 5 - 10yrs = 10 mg	2-3 times per day	As required

1.1.7. FOREIGN BODIES IN THE AIRWAY, NOSE AND EAR

AIRWAY:

Foreign bodies in the airway are common in 1-3 year old children. Think of it when the child is choking, or has a history of sudden choking followed by a wheeze or cough. On listening to the child's chest there may be a local wheeze or an area of reduced air entry. Foreign bodies may cause stridor or cough. The history may confirm inhalation of a foreign body, often a peanut or a seed if the event was observed. Consider it whenever a child has the sudden onset of respiratory symptoms—cough, wheeze or choking but has not had any prior cold symptoms (runny nose, sore throat, etc.).

- Refer to Hospital
- Admit for bronchoscopy to remove the foreign body
- If there is fever or fast breathing (secondary infection) give antibiotics

NOSE:

Gently try to remove the foreign body with a small forceps. If this fails refer to hospital for removal under anaesthesia

Ear:

- Try irrigating the ear with lukewarm water
- If the foreign body does not come out try to extract it gently with a hook.
However, never try to remove something if it cannot be seen as the eardrum could be damaged permanently.
- If this fails refer to hospital

1.1.8. EAR PROBLEMS IN A CHILD

An acute middle ear infection will start with a painful ear. If not treated early the ear drum may rupture and discharge may come out of the ear. An acute infection may develop in a chronic infection, which can (rarely) cause an infection of the mastoid bone.

a) ACUTE EAR INFECTION

Acute Ear infection can be defined as pain in the ears or pussy discharge from the ears, for a period of two weeks

General management

- Dry the ear by wicking: roll some cotton wool on a wick and put it in the ear for about half a minute, remove it and repeat this until the ear is dry. Teach the mother to do this 3 or 4 times a day. **DO NOT PUT OIL IN THE EAR**

Antibiotics

- Give Amoxicillin for 7 days

Drug	HF	Paediatric dose	Frequency	Duration
Amoxicillin 250 mg tablets 16mg/kg	U	4 -10 kg=125mg 10 -19kg=250mg	3 times daily	7days

b) CHRONIC EAR INFECTION

Mucoid discharge from the ear for more than two weeks without any pain, fever or swelling

General management

- Dry the ear using the wick (see acute ear infection)

Antibiotics

- Do not give antibiotics

c) MASTOIDITIS

Mastoiditis is an infection of the bone behind the ear and is a complication of an ear infection. There is a painful swelling behind the ear presented with fever. It needs urgent referral / admission as there can be a risk of the infection spreading to the veins inside the skull or to the meninges. Mastoiditis can also carry a risk of tetanus infection.

Hospital:

General measures:

- Admit the child
- Dry mop the ear if needed
- Give Paracetamol if required

Antibiotics:

- Ampicillin and Gentamycin IV / IM for a minimum of 10 days

Further management:

- Incision may be needed if there is abscess formation

Drug	HF	Paediatric dose	frequency	duration
Ampicillin 500 mg inj 12.5mg/kg	C/H	3-5 kg = 5mg 6-14 kg = 200 mg 15-30kg = 400 mg	4 times daily	Until child can take oral Amoxicillin
Gentamicin IM 40mg/ml 7.5mg/kg	C/H	4 kg = 30mg 6 kg = 45 mg 8 kg = 60 mg 10 kg = 75 mg	Once daily	7-10 days
Amoxicillin 250 mg tablets 16mg/kg/dose	U	4 – 10 kg = 125 mg 10 - 19 kg = 250 mg	3 times daily	Complete 10 days
Paracetamol 120 mg tablets 10mg/kg	<u>U</u>	4 -14 kg=120mg 14-19kg=250mg	3 to 4 times daily	2 or 3 days

1.1.9. A SORE THROAT IN A CHILD

A sore throat is usually caused by a virus and does not need antibiotics. Only a bacterial tonsillitis needs antibiotics to prevent rheumatic fever. A Candida infection can cause a sore throat / mouth in babies and malnourished children or children with HIV infection.

a) Viral throat infection

Sore throat usually accompanied by other cold / viral symptoms (runny nose, cough etc and usually no pus on the tonsils):

General measures:

- Give Paracetamol for pain
- Continue breast feeding, plenty of fluids
- Do not give antibiotics!

b) Tonsillitis

Sore throat with fever and swollen tender glands in the neck and / or pus on tonsils (mostly in older children) It does not usually occur with cold symptoms (runny nose, cough, etc).

General measures:

- Give Paracetamol for pain
- Plenty of fluids
- Keep the child out of school for a few days

Antibiotics:

- Give Amoxicillin for seven days
- Do not give Cotrimoxazole as this does not work for tonsillitis

c) Oral thrush (Candidiasis)

These are white plaques in the mouth that cannot be easily removed. In babies and malnourished toddlers this is quite common, in older children it can be a sign of HIV infection.

Treatment:

- Gentian violet 0.5%, apply after feeds, 3 or 4 times a day until 2 days after the white patches are gone
- Continue breast feeding
- If the Gentian violet does not work, crush Nystatin tablets and give half a tablet 4 times daily

1.2. DIARRHOEA IN CHILDREN

1.2.1. ACUTE DIARRHOEA

GENERAL REMARKS

- Many episodes of diarrhoea can be prevented by:
 - Immunization, especially measles
 - Clean water supply and better sanitation
- Improved nutrition (See chapters in prevention) & Continue breastfeeding
- The main goal in the treatment of diarrhoea is to restore /maintain hydration. There should be more fluid intake compared to fluid output. Therefore try to estimate how much fluid the child has lost or is losing through diarrhoea and vomiting
- Update vitamin A supplementation, if it is more than 4 weeks ago that the child had his last dose of vitamin A give another dose. Do not give for more than 2 months in a row

- Zinc for 10 days has proven effective to reduce the duration of the diarrhoea
- Remember the link between diarrhoea and malnutrition, address malnutrition
- Only use antibiotics when indicated. Most often diarrhoea is caused by a virus and cannot be treated with antibiotics
- Never use anti- diarrhoeal drugs as it may make the child sicker
- Remember the general danger signs

GENERAL DANGER SIGNS

- **The child is unable to drink or breastfeed**
- **The child has convulsions**
- **The child is lethargic or unconscious**

HISTORY AND EXAMINATION OF A CHILD WITH DIARRHOEA

History:

- Since when does the child have diarrhoea?
- Does the child vomit?
- Does the child have a fever?
- Is there blood and mucus in the stool?
- Did the child pass urine recently?
- How much has the child had to drink today

Examination:

- Is the child lethargic or unconscious?
- Is the fontanel sunken?
- Are the eyes sunken?
- Is the child able to drink and / or breast feed?
- Is the child very thirsty?
- When you pinch the skin of the abdomen does it go back very slowly?

Classification of dehydration

Signs	Dehydration	Treatment
Any 2 of the following signs: • Lethargic or unconscious • Sunken eyes • Not able to drink or drinking poorly • Skin pinch goes back very slowly Vomits everything	Severe	Plan C See page 15
Any 2 of the following signs: • Restless or irritable • Sunken eyes • Drinks eagerly or thirsty • Skin pinch goes back slowly	Moderate	Plan B See pages 14/15
Not enough signs for moderate or severe dehydration	Mild	Plan A See page 14

SOME REMARKS ABOUT MALNUTRITION AND DEHYDRATION:

- In severely malnourished children it is more difficult to assess the level of dehydration. The skin is already dry and leathery and skin pinch especially on the abdomen goes back slowly. Try a skin pinch in other areas like the chest and look more at other signs like a sunken fontanel. Eyes are often sunken due to loss of muscles around the eyes
- In severely malnourished children it is dangerous to re-hydrate too quickly. It is preferable to re-hydrate orally and slowly
- In addition to diarrhoea address the malnutrition as well

Drug	HF	Paediatric dose	Frequency	Duration
Vitamin A*	U	< ½ yr = 50,000U ½ - 1 yr = 100,000U 1 - 5 yrs = 200,000U	Single dose	In severe malnutrition repeat after 2 weeks
Zinc	U	2-6 month: 10 mg 6 months-5yrs: 20mg	Once daily	10 days

Three methods to make ORS

1. *Packet based, glucose based*

- Follow the instructions on the packet. Most packets are enough to make 1 litre of ORS
- Add the required amount of water
- Normal drinking water is ok. If the water is very contaminated boil it first and cool it before adding the ingredients
- Keep in a covered container
- Use within 24 hours, discard remaining preparation after 24 hours

2. *Sugar and salt solution (SSS), sugar based*

- Use an appropriate clean bottle or other container of 1 litre
- Fill it with 1 litre clean or boiled water
- Add ½ level standard (5ml) teaspoon of salt
Or: 2 pinches (using thumb and 2 fingers)
- Add 4 level teaspoons of sugar or 1 handful (using 4 fingers)
- When mixed the fluid should taste like tears
- If available squeeze in juice of one orange

3. *Rice-based ORS*

- Ground two fistfuls of dry rice into a powder
- Cook the powder in 1 litre of water
- Add two pinches of salt (using thumb and 2 fingers)
- Cool down and use as normal ORS

Whichever option is selected always ensure that the parent or guardian understands correctly.

PLAN A : Treat diarrhoea at home

This plan is used when there is mild or no clinical signs of dehydration

Explain to the mother the 3 rules:

- 1. Continue (breast) feeding**
- 2. Give extra fluids / ORS**
- 3. Return when any danger sign develops**

1. If < 6 months, continue / increase breast feeding
If > 6months, give extra food based fluids (soup, yoghurt, rice water, breast milk) and easily digestible food.
2. Give ORS after each loose stool or episode of vomiting:
 - < 2 years: 50 -100 ml
 - > 2years: 100 - 200 ml
 - if vomiting, wait 10 minutes then give again slowly by spoon
 - teach how to make ORS and explain the use
 - if you have packets, give mother 2 sachets to use at home
 - show how much to give

Explain the danger signs (as below) to the mother and tell her to return immediately when she notices them

- ☐ Restlessness / drowsiness
- ☐ Sunken eyes / sunken fontanel
- ☐ Poor drinking
- ☐ Persistent vomiting
- ☐ Skin pinch goes back slowly

Medication:

- Give Paracetamol if the child has a fever
- Give Ciprofloxacin if the child has blood in the stool
- Give Vitamin A if last dose was given more than 1 month ago

Give Zinc for 10 days

Plan B : Treat diarrhoea orally in the clinic

This plan is used when there is some/moderate dehydration. Keep the child in the Unit for 4 hours.

Follow the three steps:

1. Calculate the amount of ORS

2. Rehydrate in the clinic

3. Re-assess after 4 hours

1. Calculate the amount of ORS to be given hourly for the first 4 hours:

- Start with 10 ml per kg in the first hour
- Continue with 15 to 20 ml per kg per hour
- If the child wants more and is not vomiting, give more
- If you can not weigh, give according to age:

Total for 4 hours:

- o < 4 months 200 - 400 ml
- o 4 - 12 months 400 - 700 ml
- o 13 - 24 months 700 - 900 ml
- o 24 - 60 months 900 - 1400 ml

2. Show the mother how to give ORS and observe the first feed:

- Feed using a spoon, giving frequent small sips
- If the child vomits wait 10 minutes then start again slowly
- Continue breastfeeding

3. Re-assess after four hours:

- If no sign of dehydration, go to plan A, explain well and send the patient home
- If still some dehydration, repeat plan B and keep in clinic
- If signs of severe dehydration, go to plan C and refer

Medication:

- Give Paracetamol if the child has fever
- Give Ciprofloxacin if the child has blood in the stool
- Give Vitamin A if the last dose was given more than 1 month ago

Give zinc for 10 days

1.2.2. PERSISTENT DIARRHOEA WITHOUT BLOOD IN THE STOOL

Persistent diarrhoea is diarrhoea lasting for longer than 14 days, without blood in the stool. It can be caused by:

- o infection
- o malabsorption, e.g. in malnutrition
- o HIV infection
- o or a combination of the above

General measures:

- Give Vitamin A, if last dose was given more than 1 month ago
- Give Zinc for 10 days
- Give folic acid once daily
- Give other vitamins and minerals if available
- Do a stool test especially to check for Giardiasis or Schistosomiasis
- Ask if any worms were seen
- Monitor the weight

Antibiotics:

- If no stool test available treat as Giardiasis with Metronidazole

Fluids / Feeding:

- If the child is breast feeding give more frequent and longer breast feeds
- Mix milk feeds with maize meal
- Sour milk or yoghurt are better tolerated than fresh milk
- Give foods rich in vitamin A, Folic acid and Zinc: liver, kidney, dark green vegetables, beans, groundnuts and fish

Further management:

- If no improvement after 1 week and /or the weight is decreasing, refer or admit
- In chronic diarrhoea also consider TB, Kala azar, HIV infection

Drug	HF	Paediatric dose	Frequency	Duration
Metronidazole 10mg/kg	<u>U/C</u>	<6 kg = 50 mg 6 - 10 kg = 100 mg 10-15 kg = 125 mg >16 kg = 200 mg	3 times daily	5 days

1.2.3. DIARRHOEA WITH BLOOD

There are two main types of dysentery (diarrhoea with blood); one is caused by bacteria, the other one by amoebae. In certain areas Schistosomiasis can also be a cause for blood in the stool.

General measures:

- Give Vitamin A
- Give Zinc for 10 days
- Do a stool test

Foods / Fluids:

- Re-hydration is most important
- Continue (breast) feeding

Antibiotics:

If no laboratory is available and especially if the diarrhoea is accompanied by fever treat first for bacterial dysentery with Ciprofloxacin for 3 days. If there is no relief with the Ciprofloxacin then administer Metronidazole.

Further management:

- If the condition worsens after one week of treatment, then admit the child
- If the child is very anaemic or dehydrated admit immediately

Drug	HF	Paediatric dose	Frequency	Duration
Ciprofloxacin 250 mg tabs 10 – 30mg/kg	<u>U/C</u>	4 – 8 kg = 75 mg 8-15 kg = 125 mg 15-35 kg = 250 mg	2 times daily	3 days
Metronidazole tablet 10mg/kg	200mg <u>U/C</u>	<6 kg = 50 mg 6 -10 kg = 100 mg 10-15 kg = 125 mg >16 kg = 200 mg	3 times daily	7-10 days

1.2.4. Cholera

Classic cholera is characterised by sudden onset, severe acute painless diarrhoea (rice-water stools), vomiting and – without treatment - rapid dehydration. Incubation period is normally 2-4 days. It is spread by faecal-oral route.

A cholera outbreak is a medical emergency and needs to be dealt with immediately.

At any level presenting

General measures:

- In suspected cases notify the County Health Department and / or EWARN immediately and obtain advice!
- Take stool samples, handle samples carefully with gloves and send to a laboratory
- Treat the patient(s) on site as soon as possible, do not refer until stabilized and IV fluids have been started
- Admit in a temporary ward (school, church)
- Arrange proper disposal of stools and vomit in a pit latrine. Use chlorinated water for washing hands, patient and medical material

Food / Fluids:

- Re-hydrate according to severity of dehydration (see pgs. 13-16)

Antibiotics:

The choice of antibiotic is based on the result of the stool culture from the laboratory. Usually Cotrimoxazole or Erythromycin is fine for children under 9 years, and Doxycycline can be used in children over 8 years old. However, the main key to proper management is rapid and aggressive hydration.

Further management:

- Chlorination of public water supply. Boil the water if chlorinated public water is not available.
- Inform and educate the community in a controlled manner

Drug	HF	Paediatric dose	Frequency	Duration
Cotrimoxazole 120 mg tablets 24 mg/kg	U	4 - 6 kg = 120 mg 6 - 14 kg = 240mg 14 - 19 kg = 360mg	2 times daily	5 days
Erythromycin 200mg/5ml 12.5mg/kg/dose	U	<12 kg = 125 mg >12 kg = 250 mg	4 times daily	7 days
Doxycycline 100mg capsule		Not for children under 9 years		

1.3. MALNUTRITION

If a child does not get enough food or not enough of the right foods, this gives a short term risk of getting ill and a long term risk of not reaching his or her full potential in life. The main group at risk are the children under five.

TWO METHODS TO DETECT MALNUTRITION

- The child can present with an illness and show obvious signs indicating quite advanced malnutrition. Severity of malnutrition can be assessed either by MUAC (Mid Upper Arm Circumference) or W/H (Weight for Height)
- The child comes for regular growth monitoring and either the weight remains static for several months or it goes down. In this way the malnutrition can be detected early and the mother can be counselled early

If you see a malnourished child either for an illness or in an EPI session, never fail to address this, make a record and follow up. For prevention see also Chapter 7 on Nutrition

Classification of malnutrition

To classify the child you have to know 3 characteristics.

1. Height / Length (Height if >85cm, Length if <85cm) of the child
2. Weight of the child
3. Is oedema present or not?

Take the weight of the child and compare this with the expected weight for the child's age on a child health card. If this is not possible then use the MUAC method.

Classification		
W/H < 80% Or MUAC 11.0-12.5 cm No oedema	Moderate Malnutrition	Treat at home, Provide Health education
W/H < 80% Or MUAC 11.0-12.5 cm And either anorexia, pneumonia, severe anaemia, dehydration, lethargy	Moderate malnutrition with complications	Admit
W/H < 70% Or bilateral oedema Or MUAC < 11.0 cm	Severe malnutrition	Admit

Look for the causes of malnutrition:

o The child is not given enough food: e.g.

- does not get breast feeding (twins, orphans)
- is over 6 months and not started on weaning foods
- there is not enough food present (poverty, famine)

o The child does not take enough food: e.g.

- Prematurity or low birth weight
- Lack of appetite, lethargy
- Wrong feeding techniques
- Sores in the mouth

o There is an underlying illness: e.g.

- Diarrhoea and vomiting
- Malaria
- Anaemia, vitamin deficiencies
- Chronic illness such as: birth defect, TB, HIV, etc.

Remember that all factors are interrelated. A malnourished child is more prone to infections. When the child falls ill, food intake gets less, malnutrition increases and anaemia and vitamin deficiencies start.

1.3.1. MILD / MODERATE MALNUTRITION

Mild or moderate malnutrition can be managed at home if the child is not ill.

General measures:

- Exclude any obvious infections

Feeding:

- Encourage breast feeding
- After 4 – 6 months of age introduce weaning food
- Advise to give frequent high energy meals

Medication:

- Give vitamin A if last dose was given more than 1 month ago.(Do not give more than 2 months in a row)
- Give Ferrous Sulphate / Folic acid for 1 month
- Mebendazole for children over 1 year
- Other medicines to be given only on indication

Follow up:

- Monitor the weight monthly and advise the mother
- Ensure full immunisation
- Encourage child spacing
- Refer if the weight decreases or fails to increase in three months

1.3.2. MODERATE MALNUTRITION COMBINED WITH ILLNESS

General measures:

- Admit mother and child to the PHCC / Hospital for stabilization
- Monitor weight, height and MUAC
- Suspect and treat hypoglycaemia in any child who is drowsy, unconscious, convulsing, hypothermic, limp, lethargic, sweaty or pale
- Keep the child warm
- Check for malaria
- Look for other infections:
 - o Careful history (duration, previous medication, TB contact, feeding pattern)
 - o Examination
 - o Laboratory: Hb, malaria, stool, urine
 - o In chronic cases consider HIV test

Feeding:

- Re-hydrate if needed
- Observe breast feeding and feeding of weaning foods
- Observe diarrhoea and vomiting
- Start the child on high-energy milk (HEM) or F-100 every two to three hours (see below)
- If the child is not drinking introduce a naso-gastric tube (see below)

Medication:

- Give Vitamin A if the last dose was given more than 1 month ago (not more than 2 months in a row)
- Give Zinc once daily for 10 days
- Give an anti-malarial (Do RDT if you can)
- Give Cotrimoxazole for 5 days
- Treat other diseases if needed
- Treat any underlying infection
- Give Folic acid daily
- Give Multivitamin daily

- Wait till the appetite returns before starting Ferrous Sulphate /Folic acid and then stop the Folic acid
- If the child has oral thrush or oral sores apply Gentian Violet 0.5% after feeds

Follow up:

- If improving well, send home with:
 - Ferrous sulphate / Folic acid and Multivitamin
 - Supplementary feeding if available
 - Health education on nutrition, immunization and child spacing (weigh and measure)
 - Review every week for a month, if well then conduct monthly follow up, and monitor the weight
- If there is no weight gain after 1 month, refer to hospital: consider a trial of TB treatment after paediatric TB scoring and an HIV test

1.3.3. Severe malnutrition and kwashiorkor

PHCC/Hospital:

General measures:

- Admit the child with the mother
- Suspect and treat hypoglycaemia in any child who is drowsy, unconscious, convulsing, hypothermic, limp, lethargic, sweaty or pale
- Keep the child warm
- Re-hydrate if needed, but slowly, and orally (be very careful in children with kwashiorkor). Stop hydration if there are any signs of fluid overload. (Increased respiratory rate, puffy eyes, increased pulse rate, increase in liver size by 1 cm, triple heart sounds, wet lungs, etc.)
- Take a full history and do a full examination
- Laboratory tests: Hb, malaria, urine, stool
- If the Hb is very low and there are signs of heart failure consider a blood transfusion (see chapter on anaemia)

Feeding:

- Continue breast feeding and encourage frequent feeds
- Give 2-hourly feeding with ½ strength High Energy Milk (HEM) or diluted F-100 (to make F-75)
- If the child has diarrhoea or dehydration give ½ strength ORS (mix 1 packet of ORS with 2 litres of clean water and 50 gram of sugar) or ReSoMal
- After 2-3 days increase to F-100 or full strength HEM (if the patient is feeding orally, with improved appetite, reduced oedema, no signs of infection and has started to gain weight)
- Introduce a naso-gastric (NG) tube if needed

Medicines:

- Give Vitamin A dose, if the last dose was given more than 1 month ago and not more than two doses in a row
- If not very ill give Amoxicillin
- Mebendazole if more than 1 year of age
- If severely ill (hypoglycaemia, hypothermia, septic shock) give Ampicillin and Gentamicin
- If there is no improvement after 48 hours or condition is getting worse add Chloramphenicol to the Ampicillin and Gentamicin
- Start anti-malarial treatment (it is always good to do a rapid diagnostic test if available)
- Folic acid
- Multivitamins
- Zinc (no need if you give F-100 or Plumpy nut)
- Measles vaccination
- Wait till the child has a good appetite before starting Ferrous / Folic (then you can stop the folic acid)
- Consider standard Metronidazole for 7 days if there is a lot of gardia / amoebiasis in the area

Further management:

- Check on the child regularly and observe the feeding habits
- Monitor weight daily
- Monitor the weight for height ratio twice a week
- If the child has oedema the child can loose weight initially
- Keep the child in hospital / PHCC until she or he can eat and tolerate solid food/Plumpy nut well and is gaining weight and the mother can give the same care at home and understands the need for follow-up
- Give Plumpy nut in small frequent amounts, accompanied by water, also continue breastfeeding
- Then update the child's immunizations
- Organise weekly follow up in the nearest centre with weight check
- If there is no inpatient improvement after 2-3 weeks consider chronic diseases like TB, HIV, kala azar

Table 1. Nutritional treatment for severe malnutrition

	Initial phase	Transitional phase	Rapid weight gain phase	Rapid weight gain phase	Home treatment
Type	F 75*	F 100	F100	Plumpy nut	Plumpy nut
Nr of feeds	12	8	6 (if over 2 years)	3	3
Minimum no. of days/	2	2 - 4 When appetite returns, oedema begins to fade, not seriously ill, no NG tube	2 - 4 When no problems in transitional phase and patient can take 200 kcal/kg	2 When patient can eat plumpy nut, no oedema	When patient can eat Plumpy nut and there are no medical constraints
Amount (ml/kg/day) 6 months to 10 yrs	135	135, after 2 days add 10 ml per meal (or 40 ml/kg/day), up to 200 ml/kg/day	200	From 9 months: 1-2 sachets 3 times per day at 200 kcal/kg/day. Round up to whole sachets for each meal	From 9 months: 1-2 sachets 3 times per day at 200 kcal/kg/day
Examples 4 kg 6 kg 8 kg 10 kg	<i>2hrly</i> 45 ml 70 ml 90 ml 110 ml	<i>3hourly</i> 45-100 ml 70-150 ml 90-200 ml 110-250ml	<i>3 hourly</i> 70 ml 150 ml 200 ml 250 ml	<i>daily</i> 3 sachets 3 sachets 4 sachets 4 sachets	<i>weekly</i> 21 sachets 21 sachets 28 sachets 28 sachets

* If F 100 is not available you can dilute F-100 and add 30% extra water.

F 75: 75 kcal / 100 ml

F100: 100 kcal / 100 ml

Plumpy nut: 500 kcal / sachet (92 gram)

Naso-gastric tube (NG tube)

This is a very valuable tool in children who are unwilling to drink due to malnutrition and/or dehydration

Important points:

- Always check if the NG tube is in the right place. Inject some air into the tube with a syringe and at the same time with a stethoscope on the stomach. You should hear air entry or bubbles
- If the child starts coughing during the introduction of the tube it may be in the airway. Try again
- Attach a big (10 or 20 ml) empty syringe to the end of the NG-tube without the plunger
- Hold the syringe higher than the head of the child and pour ORS / milk in slowly. Control the speed of the fluid by holding the syringe higher or lower
- Teach the mothers. They are in general very good and patient in handling a NG-tube once they see the benefit!
- If the mother and/or the child want to breast feed, encourage them to do so
- If the child is improving, try to give fluids by mouth. As soon as the child can drink the full amount by mouth remove the NG tube
- Most children do not need the NG-tube for more than 2 or 3 days

1.3.4. HIGH ENERGY MILK (HEM)

If F 100 /F 75 is not available you can make High Energy Milk as follows:

High Energy Milk (HEM)

Full strength HEM:	liquid cow's milk	900g
	Sugar	60g
	vegetable oil	50 g
1/2 strength HEM	500 gram HEM	
	500 gram ORS	

- To get the milk, oil and sugar thoroughly mixed beat it well. It works best if you first mix oil and sugar and then add the milk
- Cover the mixture and give the mother one dose 2 hourly
- Make a new mixture every 12 hours. Give what is left to other children or the mother
- Amount of HEM needed :

Weight of the child	Amount of HEM per 2 hours	Amount of HEM per 24 hours
4 kg	40 ml	480 ml
6 kg	60 ml	720 ml
8 kg	80 ml	960 ml
10 kg	100 ml	1200ml
12 kg	120 ml	1440ml

Table 2. Systematic medical treatment for severe malnutrition

	Initial phase	Transitional phase	Rapid weight gain phase	home treatment	Preparation for discharge
Vitamin A	1 dose				
Folic acid	5 mg	1 mg/day	1 mg/day	Stop Folic acid, give combination Ferrous/Folic	
RDT test/antimalarials	Day 1				
Measles vaccination					Day of discharge
Mebendazole	Day 1 or 2				
Amoxicillin	Day 1-5				
Metronidazole	Day 1-7				
Iron			3-6 mg/kg/day (when appetite returns)	3-6 mg/kg/day	3-6 mg/kg/day 2-3 months
Ampicillin/Gentamicin/Chloramphenicol	Only for severely ill children				

Medication in malnutrition

Drug	HF	Paediatric dose	Frequency	Duration
Vitamin A*	U	< ½ yr = 50,000U ½ - 1 yr = 100,000U 1 - 5 yrs = 200,000U	Single dose	In severe malnutrition repeat after 2 weeks
Zinc	U	2-6 month: 10 mg 6 months-5yrs: 20mg	Once daily	10 days
Ferrous sulphate	U	4 - 6 kg = 6 mg 6 - 10 kg = 12 mg 1 - 3 yrs = 18 mg 3 - 5 yrs = 24 mg	Once daily	2-3 months
Folic acid 5mg tab	C/H	< 6 kg = 2.5 mg > 6 kg = 5 mg	Once daily	2-3 months
Multi vitamin	C/H	If F-100/F75 or Plumpy nut is given there is no need for further supplementation with vitamins and electrolytes, if HEM or other foods are used these are recommended.		
Electrolyte mixture	H			
Gentian violet 0.5%	U		Apply after feeds	
Mebendazole 500 mg	U	< 1yr: do not give 1-2 yrs: ½ tablet >2 yrs: 1 tablet	Single dose	
Artesunate/Amodiaquine	U	According to the malaria protocol described in chapter 2. It is advisable to test for malaria, but below the age of 5 years this is not mandatory		
Metronidazole 10mg/kg	<u>U/C</u>	<6 kg = 50 mg 6 - 10 kg = 100 mg 10 - 15 kg = 125 mg >16 kg = 200 mg	3 times daily	5-7 days

Cotrimoxazole 120mg	U	4 - 6 kg = 120 mg 6 - 14 kg = 240 mg 14 - 19 kg = 360 mg	2 times daily	5 days
Ampicillin 500 mg inj	U	3 - 5 kg = 75mg 6 - 14 kg = 200 mg 15- 30kg = 400 mg	4 times daily	If child is improving for 48 hours and then switch to oral Amoxicillin
Amoxicillin 250 mg tablets 16mg/kg/dose	U	<4kg = 62,5 mg 4 - 10 kg = 125 mg 10 - 19 kg = 250 mg	3 times daily	5 days
Gentamicin IM inj 7.5mg/kg	C/H	e.g. 4 kg = 30 mg 6 kg = 45 mg 8 kg = 60 mg 10 kg = 75 mg	Once daily	7-10 days
Chloramphenicol IV 1Gm/vial 12.5mg/kg/dose	H	3 - 4 kg = 50 mg 5 - 6 kg = 75 mg 7 - 8 kg = 100 mg 9 - 10 kg = 125 mg 11 - 16kg = 200 mg 17 - 20kg = 250 mg	4 times daily	7-10 days

* **Vitamin A: 1 cap = 200,000 IU**

- 50,000 IU = 1 drop from 1 capsule
- 100,000 IU = 3 drops from 1 capsule
- 200,000 IU = 1 capsule

1.3.5 ANAEMIA

Anaemia often presents together with malnutrition.

See chapter on anaemia

1.3.6. VITAMIN A DEFICIENCY

Lack of vitamin A can cause:

- o Night blindness
- o Corneal ulceration and blindness
- o Periods of diarrhoea can last longer
- o Measles will be more severe

Give Vitamin A if the last dose was given more than 1 month ago in any child with:

- Malnutrition
- Diarrhoea for more than 1 week
- Chronic respiratory infections

To all children with signs and symptoms of night blindness, corneal ulceration and/or measles give a full course of vitamin A:

Vitamin A		Dose	Frequency
Caps. Of 200,000 Units	U	6-12 months 100,000 U >12 months 200,000 U	Single dose on Day 1 Day 2 After 2 – 4 weeks

1.4. SOME TYPICAL INFECTIONS IN CHILDHOOD

The typical childhood infections in this chapter are all caused by viruses, so antibiotics have no effect in the initial stage, only when there are complications.

1.4.1. MEASLES

Measles is still one of the biggest childhood killers. Measles is an acute highly communicable disease, characterized by:

Initially:

- o high fever
- o child is miserable
- o conjunctivitis, running nose, barking cough, Koplik's spots
- o loss of appetite

Later:

- o generalized rash
- o diarrhoea

Recovery stage:

- o skin lesions peel off
- o rash fades
- o temperature falls

Children are mostly quite ill for more than a week, and can lose quite a lot of weight.

Common complications:

- o Bacterial bronchopneumonia
- o Bronchitis
- o Otitis media
- o Corneal ulceration
- o Protein energy malnutrition

General measures:

- Continue breastfeeding
- Increase fluid intake
- Control fever by giving Paracetamol, unwrapping and sponging
- Good care is needed

Medication:

- Give Vitamin A 1st dose at diagnosis
2nd dose next day
3rd dose 2-4 weeks later
- Zinc for 10 days
- Apply Tetracycline eye ointment 3 times daily for five days
- For uncomplicated measles there is no need for antibiotics, as soon as there are complications give antibiotics accordingly
- If you are in doubt about secondary respiratory infection give Cotrimoxazole or Amoxicillin for 5 days

Feeding:

- Encourage small frequent meals during the illness
- Increase feeding with high energy foods when the child is improving
- All food is allowed

Further management:

- Weight monitoring
- Vaccinate all younger siblings and other under fives in the community
- When other complications arise, treat accordingly

1.4.2. CHICKENPOX (VARICELLA)

Chickenpox is a highly contagious viral childhood disease. It is characterised by mild fever and an itchy vesicular rash.

General measures:

- Give Paracetamol for fever or pain
- Give frequent baths
- Try to prevent the child from scratching
- Apply Gentian Violet on any infected vesicles
- Do not give antibiotics in uncomplicated chickenpox
- Keep the child home from school until all the blisters have scabbed over (usually a few days)

1.4.3. MUMPS (PAROTITIS)

Mumps is a viral contagious infection of the parotid gland, characterised by:

- Mild fever and malaise for a few days
 - Pain in or behind the ear on chewing and swallowing
 - Painful enlargement of the parotid gland, with the ear usually displaced
- Complications: (rare): orchitis, oophoritis, meningo-encephalitis.

General measures:

- Give Paracetamol for fever and pain
- Rest and plenty of fluids
- Keep home from school for a few days
- For complications refer

1.4.4. POLIOMYELITIS

There was great hope that we could omit this chapter and announce that polio was eradicated from Sudan. But unfortunately even in 2005 new cases of polio were confirmed in Sudan. The efforts to eradicate polio are ongoing, so any case of flaccid paralysis must be reported immediately to the appropriate authorities.

Polio is an acute viral infection transmitted by faecal-oral route. It has to be noted though that 99% of the cases are asymptomatic, or only have very mild gastro-intestinal symptoms. Only 1% of the infections result in flaccid paralysis.

Clinical features:

- Minor illness of fever, malaise, headache and vomiting
- This may progress to severe muscle pain
- Paralysis is usually asymmetric
- Paralysis of respiratory muscles is life threatening
- No sensory loss

General measures:

- Strict bed rest (any activity in the first 2 weeks can increase the paralysis)
- Immobilise the affected limbs in splints
- Do not give injections! They can make the paralysis worse
- Notify the County Health Department immediately
- Immunise all children in the community around

Rehabilitation:

- When the acute stage has settled, gentle exercise of the affected limbs can be started
- Prevent deformities by active and passive exercise
- A lot of children can be helped to walk again with special shoes and callipers

2. MALARIA

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MALARIA

INTRODUCTION

In Southern Sudan malaria is a major health problem. During pregnancy it poses a serious risk to mother and foetus. Malaria is also dangerous for children under 5, for non-immune migrants, and for HIV positive persons. The peak period of transmission occurs during the rainy season (mainly April to October).

P. falciparum is the dominant species and responsible for more than 90% of the cases in SS and for the cerebral malaria. Increasing failure rate with Chloroquine and SP (Sulphadoxine-Pyrimethamine) has lead to a shift in the malaria policy to the more expensive, but more effective Artemisinin-based Combination Therapies (ACTs).

For uncomplicated malaria in non-pregnant patients:

- ***First line:*** Artesunate + Amodiaquine for 3 days
- ***Second line:*** Artemether & Lumefantrine (CoArtem®) for 3 days
- ***Third line:*** Quinine tablets for 7 days

For pregnant women see later in this chapter

2.1. UN-COMPLICATED MALARIA

Diagnosis

Suspect malaria in a patient with fever or history of fever within the last 48 hours, who has no other obvious cause for the fever. The patient may also have any of following symptoms:

- Typical malaria attack: shivering, high fever and sweating
- Headache, joint and muscle pain
- Gastro-intestinal problems (nausea, vomiting, diarrhoea)
- Anaemia
- Splenomegaly

Diagnosis in children under 5

Treat all children below 5 years with a fever or history of fever within the last 48 hours, without other obvious cause or danger signs for uncomplicated malaria. It is always good to test but not mandatory.

The same goes for severely malnourished children. In principle treat them all with anti-malarial medicines. Classical symptoms such as fever may be absent.

Diagnosis in patients older than 5 years

Before ACTs are given to this age group it is important to test using either the microscopic method or rapid diagnostic test.

** Note: If the patient is reporting fever but shows no measurable fever at the time of the examination, recheck the temperature after several hours.*

If the rapid diagnostic test or blood film is negative, the patient will probably not have malaria! When a patient tests negative, follow these steps:

1. Look for other causes of fever (e.g. UTI, RTI, viral illness, tonsillitis, otitis media, typhoid, kala azar, bacterial diarrhoea, TB etc) and treat if necessary.
2. If no cause is found and the patient has signs of significant illness, repeat the blood film at the height of fever.

Treatment of uncomplicated malaria:

For all above patients excluding pregnant women in their first trimester.

FIRST LINE TREATMENT

AS (Artesunate) 50 mg + AQ (Amodiaquine) 153 mg

Age	Weight	Number of days treatment			Total No. of Tablets
		Day 1	Day 2	Day 3	
< 1yr	4 – 8kg	½AS +½AQ	½AS +½AQ	½AS +½AQ	3 tabs
1 – 5yrs	9 – 15kg	1AS + 1AQ	1AS + 1AQ	1AS + 1AQ	6 tabs
5 – 15yrs	16 – 35kg	2AS + 2AQ	2AS + 2AQ	2AS + 2AQ	12 tabs
Adult	>35kg	4AS + 4AQ	4AS + 4AQ	4AS + 4AQ	24 tabs

How to give the Artesunate / Amodiaquine blister packs:

- Show the blister package and explain it
- Give the first dose in the clinic
- Observe the children for 30 minutes. If they don't vomit they can go home. If they vomit the tablets, repeat the full dose
- Reduce fever by tepid sponging and giving Paracetamol. Give first dose in the clinic, then give two / three doses to take home
- Encourage the patient to take plenty of oral fluids / breast milk
- Tell the patients if they do not feel better after 2 days (48 hours) or if their condition worsens they should return

- Some patients may experience nausea, vomiting, abdominal pain, diarrhoea or itching with this treatment. It is mostly mild, and patients should complete the treatment

Treatment during pregnancy

If malaria is confirmed:

- **In the first trimester;** Oral Quinine

The dose is 2 tablets of Quinine 3 times per day for 7 days.

- ***In the second and third trimester; the first line of treatment is the combination of Artesunate / Amodiaquine for 3 days (as per adult schedule)***

SECOND LINE TREATMENT

Reasons for no improvement after 48 hours can be:

- not having taken all the tablets as prescribed
- The patient may have fever from causes other than malaria
- The patient may have vomited the tablets
- The quality of the drug may be poor
- Possible drug resistance

Review the possible causes. Do a careful history and physical exam to look for other reasons for the illness and fever.

Do not repeat the RDT within 3 weeks of anti-malarial treatment because the test may stay positive even though the malarial parasites have all been killed or reduced. Therefore, for the final diagnosis of resistance use microscopic method.

In the unlikely event of suspected resistance to ACTs and no features of severe malaria, excluding pregnant women:

- A microscopic confirmation is required
- Artemether and Lumefantrine are given

Treatment schedule second line (Artemether20mg + Lumefantrine 120mg)

Age	Weight in Kg.	Day 1		Day 2		Day 3		Total nr. of tablets
		<i>First dose (tabs)</i>	<i>After 8 hrs. (tabs)</i>	<i>Morning (tabs)</i>	<i>Evening (tabs)</i>	<i>Morning (tabs)</i>	<i>Evening (tabs)</i>	
< 2 months	<5kg	Not recommended						
2-24 months	5 – 14	1	1	1	1	1	1	6
2– 8yrs	15 – 24	2	2	2	2	2	2	12
8 – 12yrs	25 – 34	3	3	3	3	3	3	18
> 12yrs	> 35	4	4	4	4	4	4	24

Notes:-

- **Avoid in pregnancy**
- **Absorption of Lumefantrine is increased when the drug is taken with food**

2.2 SEVERE AND COMPLICATED MALARIA

This is malaria with life threatening complications and needs urgent intervention and/or referral.

Diagnosis

In severe malaria, the patient has fever or history of fever in the previous 48 hours and one or more of the following

DANGER SIGNS:

- Fits (convulsions) in a patient not known to have these before
- Abnormally sleepy or difficult to wake or extreme weakness
- Unconscious and unresponsive to pain (coma)
- Severe anaemia and / or jaundice
- Dark or “coca-cola” coloured urine
- Bleeding with no known cause, (including vaginal bleeding in pregnancy)
- Trouble breathing and / or poor circulation or shock
- Extreme fever of >40° C (hyperpyrexia)
- Not able to drink or breastfeed or continuous vomiting

Severe malaria is an emergency. Death is often due to delayed referral and treatment

Management (in PHCC or hospital)

CEREBRAL MALARIA / UNCONSCIOUS PATIENT:

This is a medical emergency and needs 24 hour monitoring.

Always assess

- | | |
|---|---|
| ▪ <i>Level of consciousness</i> | ▪ <i>Temperature, pulse rate and blood pressure</i> |
| ▪ <i>Rate and depth of respiration</i> | ▪ <i>State of hydration</i> |
| ▪ <i>Presence of anaemia and jaundice</i> | |

Patients with severe malaria on Quinine are prone to hypoglycaemia, especially pregnant women and children

General measures:

- Admit urgently
- Let patient lie on the side, maintain airway and turn patient every 2 hours
- Establish an intravenous (IV) line
- Re-hydrate if required
- Start Dextrose 5% /1 litre water (D5%/W) infusion
- Put Dextrose 50%, 1ml/kg in the first drip or give it as an IV bolus diluted with an equal volume of water
- If the patient is unconscious put an indwelling catheter
- Make an input-output chart
- Check BP, pulse, temperature, input-output, and blood glucose 4 hourly

Diagnosis:

- Confirm the diagnosis of malaria by microscope
- Exclude other severe diseases like septicaemia and meningitis
- In pregnant women exclude eclampsia (check blood pressure and urine for albumen)
- Take blood sample for the following:
 - o Measuring Hb
 - o Testing for Malaria
 - o if very pale check Blood group and cross match
 - o Measuring blood sugar (every 4 hours if possible)

If any suspicion of meningitis do a lumbar puncture for CSF sample

Medication:

- Quinine hydrochloride 10mg/kg: give first dose in D/W over 4 hours. For the amount of D 5% /W, see schedule below. First amount in 4 hours, then each amount 8 hourly
- Continue with doses 10mg/kg every 8 hours until the patient can take oral Quinine to complete 7 days

Quinine 300 mg/ml IV schedule (10 mg /kg / 8 hours)

Age	Weight	Dose of Quinine (mg)	Qty of Quinine (ml)	Quantity of D/W in 8 hrs (ml)
< 4 mths	5 – 6	60	0.2	100
4–11 mths	7 - 10	90	0.3	200
1 – 2 yrs	11 – 14	120	0.4	250
3 – 4 yrs	15 – 18	180	0.6	300
5 – 7 yrs	19 – 24	240	0.8	400
8 – 10 yrs	25 – 35	330	1.1	400
11 –13 yrs	36 – 50	450	1.5	500
Adults	> 50 Kg	600	2.0	500

300 mg tablets Quinine oral for 7 days

Age	Weight	Quinine	Frequency
3-12 mths	5-10 kg	¼ tab	3 times daily
1- 5 yrs	10-18 kg	½ tab	3 times daily
5- 7 yrs	18-24 kg	¾ tab	3 times daily
7-12 yrs	24-35 kg	1 tab	3 times daily
10- 15 yrs	35- 50 kg	1.5 tabs	3 times daily
Adults	> 50 kg	2 tab	3 times daily

Notes:

- ❖ Never give Quinine just as an IV injection (in desperate situations when no IV fluids are available, give the Quinine intramuscularly (IM)
- ❖ If there is dehydration give Ringer lactate but do not delay the Quinine
- ❖ Alternately you can give the patient (esp. children) an NG tube for ORS, breast milk or extra glucose
- ❖ Always beware of hypoglycaemia, symptoms can be abnormal behaviour, restlessness, sweating or a sudden change in consciousness. Check blood glucose and give Dextrose 50% if needed

RECTAL ARTESUNATE

If neither Quinine injections nor IV fluids are available, then rectal Artesunate can be a life saving alternative.

Dose schedule for rectal Artesunate (10 mg/kg) / age:

AGE	DOSE	No. of rectal suppository
0-6 months		DO NOT USE
6 – 11 months	50 mg	1 X 50 mg
1 – 2 years	100 mg	2 X 50 mg
3 – 4 years	150 mg	3 X 50 mg
5 – 10 years	200 mg	4 X 50 mg or 1 X 200mg
Over 10 years	400 mg	8 X 50 mg* (or 2X200mg)

**This is not very practical, but can be useful just in case neither the adult suppository nor the IV quinine is available:*

- *If the rectal suppository is expelled within the first hour, insert another dose immediately*
- *If after 24 hours the patient fails to get access to IV treatment and is still unable to take oral medication, repeat the rectal Artesunate*

How to Give Rectal Artesunate:

1. Dip one rectal capsule in drinking water to moisten*
2. Gently push the rectal capsule about 2 – 4 cm into the anal opening
3. Repeat until the full dose has been administered

** Note: the suppository may not work if it is not put in water first*

CONVULSIONS:

Convulsions are common in cerebral malaria. They can be due to:

- Hyperpyrexia
- Hypoglycaemia
- The malaria itself
- In pregnant women always consider eclampsia
- Another diagnosis to consider is meningitis or encephalitis

Always keep diazepam and Dextrose 50% on an emergency tray near the patient

General measures:

- Lie the patient on their side and maintain airway
- Give Diazepam IV immediately
- Give Dextrose 50% IV, diluted with an equal amount of water
- Remove clothing, do tepid sponging and give Paracetamol by NG tube or suppository

Diazepam inj IV (0.2 mg/kg) 1 ampoule is 10 mg in 2 ml

Age:	<2 mths	2 - 12 mths	1 - 5 yrs	5- 15 yrs	>15 yrs
Wt	<4 kg	4-8 kg	8- 15	15-35	>35 kg
Dose (mg)	0.8 mg	1.6 mg	3 mg	5 mg	10 mg
Dose (ml)	0.15 ml	0.3 ml	0.6 ml	1 ml	2 ml

Diazepam rectally 1 ampoule is 10 mg in 2 ml (same ampoule as used for IV administration)

Age:	<2 mths	2 -12 mths	1 - 5 yrs	5- 15 yrs	>15 yrs
Wt	<4 kg	4-8 kg	8- 15	15-35	>35 kg
Dose (mg)	1-2 mg	2-4 mg	5 mg	10 mg	10-20 mg
Dose (ml)	0.2-0.4 ml	0.4-0.8 ml	1 ml	2 ml	2-4 ml

Dextrose 50 % IV (0.5-1ml/kg) 1 ampoule is 50 ml

Age:	<2 mth	2 -12 mths	1 - 5 yrs	5- 15 yrs	>15 yrs yrs
Wt	<4 kg	4-8 kg	8- 15	15-35	>35 kg
Dose (ml)	2 ml	5 ml	10 ml	20 ml	50 ml

Notes:

- ❖ Keep a syringe with the right amount of Diazepam and the name of the patient on the bedside table
- ❖ If an IV line cannot be inserted into a child, give Diazepam rectally: Connect a piece of tubing to a syringe, put it 2-4 cm up the rectum and give the Diazepam. Squeeze the buttocks together for a few minutes. Account for the amount that will remain in the tubing. In small amounts it

may make it easy to dilute it with some D/W, or give some D/W afterwards to empty the tubing.

- ❖ If the IV line fails, wait till the convulsion has stopped, then insert an NG tube and give dextrose or glucose by NG tube
- ❖ Give Paracetamol 4-6 hourly by NG tube

SEVERE ANAEMIA

See chapter anaemia

PULMONARY OEDEMA

Symptoms: Dyspnoea, rapid breathing and Cough with frothy sputum

General measures:

- Exclude other causes like pneumonia, pleural effusion, foreign body or trauma
- Exclude anaemic heart failure, if so transfuse
- Prop the patient up
- Reduce the fluid input
- Give Oxygen
- Give Furosemide IV, (for an adult, start with 20 mg IV, increase if needed; For children use 1mg /kg)

RENAL FAILURE

Symptoms: Urine output less than 50 ml in 3 hours for an adult.

General measures:

- Assess the hydration of the patient. If he/she seems dehydrated give extra fluids. Take care not to overload
- If the patient seems to be in shock:
 - Raise the foot of the bed
 - Give Ringer lactate fast
 - Review input-output
 - Look for haemorrhage or septicaemia and treat accordingly
- If the hydration seems well or if the patient seems over hydrated (oedema, dyspnoea, etc.) but there is still no sufficient urinary output:
 - Try Furosemide IV (See chapter about renal failure)
 - If no effect refer

BLEEDING TENDENCY (Increase case as above)

General measure:

- transfuse with fresh whole blood

PREGNANT WOMEN WITH SEVERE MALARIA

Pregnant women with severe malaria are prone to go into labour or miscarry. Especially in unconscious patients be aware of the possibility.

Treatment:

- Treat the malaria urgently
- Make sure her blood sugars remain at a good level. Give Dextrose 5%. Check blood sugar 4 hourly and give Dextrose 50% accordingly
- Check for contractions, vaginal bleeding and foetal heart of the baby every 4 hours or more often if patient is restless
- Check blood group and cross match and look for potential donors
- Keep Oxytocin / Ergometrine ready for after the delivery
- If a premature baby is born keep him / her warm and feed early with breast milk or if this is not available use glucose instead

3. SEXUALLY TRANSMITTED INFECTIONS (STI's)

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SEXUALLY TRANSMITTED INFECTIONS (STI's)

INTRODUCTION

STI's are transmitted by sexual intercourse or during birth by passage through the birth canal from mother to child. One of the major STI's is HIV infection. This will be addressed in a separate chapter. A syndromic approach means that diagnosis is based on symptoms, not on a laboratory test.

A syndromic approach to STI management is chosen, because it is problem oriented; highly sensitive and does not miss mixed infections; more effective; provides opportunity for counselling and education ; and increases access to treatment since most clinics have limited laboratory facilities.

GENERAL REMARKS ON STI'S

1. Make yourself familiar with the syndromic approach; Define the main symptoms
2. In women always ask about the possibility of pregnancy
3. If the patient comes for the first time with this complaint give first line therapy
4. Only when the first line drugs fail and you are sure it is not a re-infection, consider second line therapy
5. Trace and treat all contacts!
6. Treatment of STIs is a package:
 - Give the necessary antibiotics
 - Treat the partner(s)
 - Give health education about STIs and HIV
 - Discuss risk reducing behaviour
 - Offer condoms
 - Offer VCT for HIV
7. Doxycycline and Ciprofloxacin should not be used in pregnant or breast feeding women

3.1. URETHRAL DISCHARGE IN MEN

Causes

The commonest causes are gonorrhoea, chlamydia or a combination. Because the signs and symptoms are the same, both must be treated. Less common is trichomoniasis.

Clinical features

- Pus appearing at tip of penis or staining of underwear
- Burning pain on passing urine

Examination

- Confirm discharge
- Exclude ulcers
- Screen for syphilis and HIV if possible

FIRST LINE TREATMENT

- Ciprofloxacin + Azithromycin in a single dose
- Partner(s) if pregnant or breastfeeding: change Ciprofloxacin to Cefixime
- Provide health education/ risk reduction/ condoms/ VCT
- If Azithromycin is not available you can use Erythromycin

If discharge and / or dysuria persist and all partners are not treated:

- Start treatment again for all partners

If discharge and / or dysuria persist and all partners were treated:

- Exclude presence of ulcers under foreskin
- Give Metronidazole single dose

If discharge still persists:

- Refer to hospital

Drug	HF	Dose	frequency	duration
Ciprofloxacin		500mg	Single dose	
Cefixime		400mg	Single dose	
Erythromycin		500mg	QID	7 days
Azithromycin		2 g	Single dose	
Metronidazole	U/C	2 g	Single dose	

3.2 ABNORMAL VAGINAL DISCHARGE SYNDROME

Some vaginal discharge is normal: it is odourless, there is no associated itching, small in quantity and white to transparent (it changes during the monthly cycle). However any woman with a change in vaginal discharge, either an increase, change in colour, smell or blood stained should be examined.

Causes

It can be caused by a variety of organisms. It can also be caused by hormonal changes, obstetric conditions or cancer of the cervix. So always take a full history, including pregnancy, last menstrual period, family planning, contact bleeding, long term use of antibiotics, poorly controlled conditions such as diabetes etc.

Clinical features

- Gonorrhoea: thin slightly yellow pussy discharge with no smell
- Trichomoniasis: greenish yellow discharge, with small bubbles, a fishy smell and itching of the vulva
- Candidiasis: very itchy, thick white discharge like yoghurt
- Mycoplasma / Chlamydia : non-itchy, thin, colourless discharge
- Cancer of the cervix: blood stained foul-smelling discharge
- Absence of abnormal discharge does not mean absence of infection. Always treat partners of infected men even without symptoms

Examination

- Abdominal examination (pregnancy, masses, tenderness)
- Vaginal examination: tenderness, uterus and adnexae, dirty ulcers of the cervix, discharge or blood on the glove
- Exclude urinary tract infection (UTI) and/or schistosomiasis
- Screen for syphilis /HIV if possible

Treatment

- No lower abdominal tenderness and no itching or redness, only discharge:
 - Metronidazole
- No lower abdominal tenderness but there is itching, redness or excoriations:
 - one Clotrimazole pessary at night + Metronidazole
- If there is lower abdominal tenderness plus discharge:
 - Azithromycin +Ciprofloxacin (or Cefixime in pregnancy) + Metronidazole + treat all partners.
- Health education/risk reduction/condoms/VCT
- If still no relief refer to hospital
- If (smelly) bleeding or any other suspicion of malignancy refer to hospital

Drug	HF	Dose	frequency	duration
Clotrimazole pessary	U/C	500 mg	Single dose at night	
Azithromycin		2 g	Single dose	
Metronidazole in pregnancy		200 mg	3 times daily	7 days
Metronidazole	U/C	2 g	Single dose	

3.3. NEONATAL CONJUNCTIVITIS

This is severe pussy conjunctivitis accompanied by swelling and oedema of the eyelids in the first month of life and often caused by gonorrhoea or Chlamydia.

PREVENTION: It can be prevented by treating the STI's in pregnancy and/or instilling one dose of Tetracycline eye ointment carefully in the conjunctival sacs of the baby as soon as possible after birth.

TREATMENT: TREAT IMMEDIATELY.

- Ceftriaxone 50mg/kg (max. 125mg) IM single dose
- Begin treatment before referral.
- Wash the eyes repeatedly with clean water and apply the antibiotic ointment hourly
- Repeat washing and antibiotic EVERY HOUR - DAY and NIGHT until the pus stops
- Also treat the mother and her partner for gonorrhoea

3.4. GENITAL ULCERS IN MEN AND WOMEN

The commonest causes of genital ulcers are syphilis, chancroid, lymphogranuloma venerum, granuloma inguinale and genital herpes. Ulcers facilitate transmission of HIV. Untreated ulcers can lead to serious complications. Unfortunately, there is no effective cure for herpes yet.

Clinical features

- Primary syphilis: the ulcer is at first painless. It may be on or between the labia, or on the penis. Secondary syphilis: Occurring later than three months of onset with generalised skin rash and often enlarged lymph nodes,
- Tertiary Syphilis: Discussed later in text
- Herpes: small, multiple, usually painful vesicles or ulcers
- Granuloma inguinale: an irregular ulcer occurring in the inguinal area which increases in size and may cover a large area
- Chancroid: multiple, large, irregular ulcers with dirty, smelling discharge and associated pain on the frenulum of the penis or on/between labia

Examination

- Check for blisters or ulcers between labia and under foreskin
- Look for lymph nodes in the inguinal area
- Screen for syphilis/HIV if possible
- Consider malignancy especially in older persons

Treatment

- Ciprofloxacin + Benzathine penicillin
- If ulcer persists and partners are not treated:
Repeat Ciprofloxacin + Benzathine penicillin and treat all partners
- If ulcer persists and partners were treated: Erythromycin
- If patient or partner is allergic to penicillin: Erythromycin
- Do not give Ciprofloxacin in pregnancy
- Health education/risk reduction behaviour/condoms/VCT
- If any suspicion of malignancy, refer to hospital.

Drug	HF	Dose	frequency	duration
Ciprofloxacin	U/C	500 mg	Twice daily	3 days
Benzathine penicillin	C	2.4 MU IM	Single dose	
Erythromycin	U/C	500 mg	4 times daily	7-10 days

3.5. INGUINAL SWELLING (BUBO)

Refers to lymph node enlargement in the groins which maybe painful and fluctuant.

Causes

This is mainly seen in lymphogranuloma venereum and chancroid.

Clinical features

- Excessively swollen inguinal glands
- Painful or tender
- Swellings may become fluctuant if pus collects

Examination

- Check for swollen glands in groins
- Are they fluctuant or tender?
- Check for genital ulcers
- Exclude other causes of enlarged lymph glands like infection / inflammation in the lower limbs (legs and feet)

Treatment

- Aspirate bubo's with a big sterile needle through healthy skin (Never incise bubo's)
- Doxycycline + Ciprofloxacin
- If pregnancy, breast feeding or penicillin allergy, give Erythromycin

Drug	HF	Dose	frequency	duration
Ciprofloxacin	U/C	500 mg	2 times daily	3 days
Doxycycline	U/C	100 mg	2 times daily	10 days
Erythromycin	U/C	500 mg	4 times daily	14 days

3.6. SCROTAL SWELLING:

Scrotal swelling can be of infectious or non infectious cause.

Clinical features:

- Unilateral testicular acute pain
- Swelling and redness on the adjacent skin
- The adjacent testis may likewise be painful
- Sometimes accompanied by urethral discharge

Causes

When accompanied by discharge, gonococcal or chlamydia infections are likely.

Other common causes other than STI esp. in younger boys are:

- E. coli, Klebsiella, Pseudomonas infections.
- Mumps (swelling within a week of the parotid swelling)
- Tuberculosis is to be suspected if there are lesions elsewhere

Non-infectious scrotal swellings can be due to:

- trauma with intrascrotal haemorrhage
- testicular torsion with severe pain (emergency)
- tumour (painless)

Treatment:

- If swelling + urethral discharge, see urethral discharge
- Bed-rest
- analgesics
- scrotal support
- For non infectious causes or if in doubt refer to hospital

3.7 GENITAL WARTS

Most commonly, these are cauliflower-like and spreading, known as condyloma acuminata. They may go unrecognised or present with itching, bleeding and / or burning sensation. They may easily be confused with condyloma lata, a complication of secondary syphilis.

Cause

They are caused by a viral infection. Especially in the presence of HIV infection they can become very extensive. Treatment can also be slow and frustrating.

Treatment

- Protect normal skin with Vaseline
- Apply Podophyllin resin paint 15% to the warts 1-3 times weekly
- Wash it off after 4 hours
- Do not use Podophyllin in pregnancy
- If no relief after several weeks refer for surgery / electro-cautery

3.8. LOWER ABDOMINAL PAIN SYNDROME IN WOMEN/PELVIC INFLAMMATORY DISEASE (PID)

****If the patient is pregnant see chapter on obstetrics****

Cause

Pelvic inflammatory disease is an ascending infection of the uterus and tubes caused by gonorrhoea, chlamydia and/or anaerobes unrelated to pregnancy or surgery.

Keep in mind differential diagnoses:

- | | |
|---|----------------------------------|
| - Ectopic pregnancy | - Acute Appendicitis |
| - Puerperal sepsis(After delivery or miscarriage) | - Torsion of ovary or cyst |
| - Cystitis | - Threatened abortion |
| | - (Attempt of) criminal abortion |

Full history

- | | |
|--|--------------------------------------|
| • Fever? | • Diarrhoea? |
| • Abdominal pain? | • Any dysuria or frequency of urine? |
| • Last menstrual period, and pattern- irregular/ regular | • Difficulty in getting pregnant? |
| • Pain during sexual intercourse? | • Any abnormal vaginal discharge? |
| • Any nausea/ vomiting? | |

Examination

- General condition of the patient, fever, dehydration
- Abdomen: bowel sounds present or not, any distension, rebound tenderness
- Vaginal exam: any signs of pregnancy, normal or ectopic
- Any discharge or bleeding
- Any signs of interference with the pregnancy (herbs, etc.)

Treatment mild PID: PHCU / PHCC

(No temperature, no vomiting and only moderate pain with or without discharge)

- Ciprofloxacin + Azithromycin + Metronidazole
- If no improvement after 7 days refer to hospital

Treatment severe PID: PHCC / Hospital

(Temperature more than 38° C with marked abdominal tenderness and possible vomiting)

- Admit
- Nothing by mouth
- IV fluids + IV antibiotics
- Ampicillin IV+ Gentamicin IV + Metronidazole IV
- If patient is improving change to oral after temperature is down
- If no response after 48 hours suspect abscess
- Refer or consider laparotomy

Drug	HF	Dose	frequency	duration
Ciprofloxacin	U/C	500 mg	2 times daily	3 days
Azithromycin		2 g		Single dose
Metronidazole	U/C	400 mg	3 times daily	7 days
Ampicillin	C/H	500mg	4 times daily	7 days
Gentamicin	C/H	80 mg	3 times daily	7 days
Metronidazole IV	H	500 mg in 100 ml	3 times daily slowly in 20 minutes	Until patient can take oral

3.9. SYPHILIS OF LONG / UNKNOWN DURATION

Also known as tertiary syphilis, it causes damage to organs such as skin, bone or liver (tumours, itching rash) cardiovascular syphilis (aneurysm and valvular disease) and/or the nervous system (paralysis, meningitis, blindness and death). Tertiary syphilis may also lead to complications of pregnancy: habitual abortion, premature birth, intra-uterine growth retardation, still birth, neonatal death, congenital syphilis and congenital malformations. The diagnosis may be made unforeseen at antenatal care or in investigating other conditions.

Treatment

- Benzathine penicillin IM: 3 doses
- Or: Doxycycline for 30 days
- In neurosyphilis: Procaine penicillin for 21 days

- In pregnancy or breast feeding: Erythromycin for 30 days
- Treat partner also with: 3 doses
- Treat baby after delivery even if the woman was treated

Drug	HF	Dose	frequency	duration
Benzathine penicillin	C	2.4 MU IM	Once weekly	3 doses
Doxycycline	U/C	100 mg	2 times daily	30 days
Erythromycin	U/C	500 mg	4 times daily	30 days
Procaine penicillin	C	600 mg	Once daily	21 days

Treatment for the newborn baby

- No symptoms, but mother was positive for syphilis and treated during pregnancy: Benzathine penicillin 1 dose only
- Congenital syphilis, baby has clinical signs: Procaine penicillin for 10 days

Drug	HF	Dose	frequency	duration
Benzathine penicillin	C	30 mg/kg	One dose only	
Procaine penicillin	C	50 mg /kg IM (50.000u/kg)	Once daily	10 days

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OBSTETRIC AND GYNAECOLOGICAL CONDITIONS

INTRODUCTION

Good pregnancy and delivery care is essential in a health care system. There is no way to replace textbooks and hands-on training but we will try to outline the medical part of treatment of the most common problems in pregnancy. It is beyond this manual to cover all the technical aspects and skills involved in the actual delivery. The only way to detect danger signs early is to have a proper antenatal care service. (see Chapter on ANC).

This chapter is divided as follows:

I disorders in pregnancy

II abortion

III complications in the first stage of labour

IV complications in second stage of labour

V complications in third stage of labour (or 'post partum complications')

I. DISORDERS IN PREGNANCY:

1. ANAEMIA IN PREGNANCY

This is the most frequent complication in pregnancy. It has a number of possible causes, and a woman may be affected by more than one. For mild/moderate anaemia see chapter on anaemia and chapter on ANC. Exclude bleeding.

SEVERE ANAEMIA(Hb <6g/dl): PHCC / Hospital

If less than 34 weeks and not ill:

- Rest and good diet
- Treat for malaria (see above) and provide bed net
- Ferrous sulphate + Folic acid twice daily
- Mebendazole 500 mg single dose as anthelminthic
- Ask about bleeding
- Look for other underlying diseases (TB, HIV, etc)
- Recheck Hb after 2 weeks

If more than 34 weeks and/or very ill or unresponsive to treatment: (Hospital)

- Admit
- Define underlying cause for anaemia and treat
- See above treatment
- Keep in hospital for delivery

VERY SEVERE ANAEMIA (Hb<4g/dl): HOSPITAL

- Admit urgently
- Blood group and cross match
- If cardiac failure or labour imminent:
 - o Transfuse blood slowly, 500 ml in 3-4 hours
 - o Give Furosemide 40 mg IV with each unit of blood (preferably packed cells)
 - o Keep 1-2- units of blood in stock for delivery
- All of the previous measures

Drug	HF	Dose	frequency	duration
Ferrous sulphate 200mg + Folic acid 0.25mg	U/C		2-3 times daily	1-3 months
Sulphadoxine 500mg- Pyrimethamine 25mg	U/C	3 tablets	Single dose	In 2 nd and 3 rd trimester
Mebendazole 500mg	U/C	1 tablet	Single dose	In 2 nd and 3 rd trimester

2. MALARIA IN PREGNANCY

Malaria can cause many complications in pregnancy: both for mother and foetus

Clinical features (see also chapter on Malaria)

- Women from endemic areas can be asymptomatic; the only symptom can be (severe) anaemia.
- Women who come from non-malarial areas can show:
 - ❖ Acute febrile illness
 - ❖ Severe haemolytic anaemia
 - ❖ Hypoglycaemia
 - ❖ Coma / convulsions
 - ❖ Abortion, foetal death
 - ❖ Premature labour

Examination in a severely ill / unconscious pregnant woman

- General examination and differential diagnosis
 - o Pupils, neck stiffness (differentiate from trauma, meningitis)
 - o Blood pressure (consider eclampsia)
 - o Abdominal exam (contractions, foetal heart)
 - o Vaginal exam (signs of labour, bleeding, infection or induced abortion)
 - o Ask relatives about pre-existing epilepsy

- Laboratory
 - Measure Hb
 - Malaria test
 - Test urine for albumin, sugar and sediment
 - Check blood group if Hb low
 - Measure blood glucose if possible

Always be aware that a woman with severe malaria can go into labour even if she is unconscious

Management: See chapter 2 malaria

3. URINARY TRACT INFECTION (UTI) IN PREGNANCY

Infection of bladder and kidney are more common in pregnancy because of the changes in the body. UTIs may contribute to premature labour.

3.1. CYSTITIS

Clinical features

- Dysuria - frequency and urgency
- Occasionally blood in urine
- Lower abdominal pain
- False labour

("Hot urine" a very common complaint is not the same as dysuria! In dysuria micturation is frequent and painful)

Examination

- Urine microscopy for WBCs and bacteria

Management

- Plenty of fluids
- Amoxicillin or Cotrimoxazole (is safe in pregnancy)

3.2. PYELONEPHRITIS

Clinical features

- Fever
- Pain and tenderness in the kidney area
- Vomiting

Examination

- Tenderness in the kidney area to gentle percussion with fist

- Urine test (preferably wash the vulva first)

Management: PHCC / Hospital

- Admit
- IV fluids if patient is vomiting
- Ampicillin IV/IM till vomiting stops, then change to oral Amoxicillin

Drug	HF	Dose	frequency	duration
Amoxicillin	U/C	500mg	3 times daily	3 days for cystitis 14 days for pyelonephritis
Ampicillin IV/IM	C/H	500 mg	4 times daily	As long as needed

4. STI's IN PREGNANCY

Treatment of sexually transmitted infections is especially important during pregnancy, because they may affect the baby. Treatment of all partners is important to prevent re-infection. See also chapter about STIs.

SYPHILIS

This is the most important STI in pregnancy as it can cause abortion, stillbirth or congenital syphilis of the child. All women in ANC should be tested for syphilis on their first visit.

Treatment

- Benzathine penicillin IM: 3 doses
- Treat all partners also with: 3 doses
- Treat baby after delivery even if the woman was treated

Drug	HF	Dose	frequency	duration
Benzathine penicillin	C	2.4 MU IM	Once weekly	3 doses

Treatment of the baby

- No symptoms, but mother was positive for syphilis and treated during pregnancy: Give Benzathine penicillin - 1 dose
- Congenital syphilis, baby has clinical signs:
Procaine penicillin for 10 days

Drug	HF	Dose	frequency	duration
Benzathine penicillin 2.4 MIU	C	30 mg/kg (= 50,000U/kg)	Single dose	
Procaine penicillin (3 MIU+ 1 MIU)	C	50 mg /kg IM (50,000U/kg)	Once daily	10 days

5. HIV/AIDS IN PREGNANCY

As mentioned in the chapter about ANC all pregnant women should be encouraged to know their HIV status

Management in HIV positive pregnant women

- Advice on personal hygiene, nutrition and positive living
- Encourage her to come early when ill
- Give Cotrimoxazole 960 mg daily life long

Note: if she takes this she does not need to take the SP prophylaxis in pregnancy.

- Give Multivitamins daily
- Give Ferrous sulphate / Folic acid daily for 2 months
- Provide easy access for counselling
- Advice her to deliver in a facility
- Provide Nevirapine at the time of delivery

PREVENTING MOTHER TO CHILD TRANSMISSION (PMTCT) OF HIV

1. During pregnancy (5-10% of infants may be infected)
2. During delivery (10-20%)
3. During breastfeeding (10-20%)

Interventions are possible to reduce transmission:

a. SHORT COURSE ANTI-RETROVIRAL PROPHYLAXIS

Every HIV +ve mother needs to get one dose of Nevirapine at onset of labour and her baby one dose between 24 and 72 hours after birth. Time should be devoted to make sure that HIV-infected mothers understand it.

	Adult dose	Infant dose
A	NVP • 200 mg (1 tablet) • Provided to HIV +ve pregnant women at >28 wks • With instructions to take at the onset of labour	<u>NVP – for home delivery</u> • 0.6 ml NVP syrup • Provided to HIV +ve pregnant women at >34 wks in special syringe • With instruction to give to newborn within 24-72 hrs after birth <u>NVP- for facility delivery</u> • 0.2 ml/kg NVP syrup to be administered within 24-72 hrs after birth
B	If false labour: Repeat dose (200 mg) if	Same as scenario A or D depending on time lapse between NVP administration and

	delivery not occurred 48 hours after taking first dose	delivery
C	If prolonged labour: Repeat dose (200 mg) after 48 hours	Same as scenario A or D depending on time lapse between NVP administration and delivery
D	If delivered within 4 hours of taking NVP	• First dose of 0.2ml/kg (or 0.6 ml NVP if administered at home) immediately following delivery • Second dose of 0.2ml/kg or 0,6 ml NVP if administered at home 48-72 hrs after delivery
E	If delivered by HIV+ women who has not taken NVP	Same as scenario D

b. DURING DELIVERY:

Delivery at a health facility is strongly recommended for a woman with HIV. To reduce exposure of the child to the virus:

1. Avoid unnecessary vaginal examinations
2. Do not rupture membranes early. If membranes are ruptured, ensure a quick delivery:
3. Avoid routine episiotomies
4. Avoid routine suctioning of the baby, in a normal baby with a good APGAR just wipe the mouth
5. Use of labour curve is always recommended, and prolonged labour should be managed with Oxytocics or other interventions

c. COUNSELLING ON SAFE INFANT FEEDING OPTIONS

- HIV-infected women should not breastfeed if replacement feeding is feasible and safe, which is rarely the case in Sudan
- If a woman breastfeeds, she should breast feed EXCLUSIVELY. Mixing breast milk with other foods doubles the risk of infant HIV infection. So breast milk only, no water, other milk or food or traditional medicine until the child is old enough to be weaned
- At 6 months the infant should be weaned quickly. Normally the advice is to wean a child slowly, but for HIV +ve mothers it is important to keep the period of mixed feeding as short as possible.

d. FAMILY PLANNING

HIV-infected women should receive counselling about risk of infant infection, and family planning options. Otherwise healthy HIV-infected women can use any modern method of contraception. See chapter on Family Planning.

6. DIABETES IN PREGNANCY

Diabetes can exist before pregnancy or develop during pregnancy. It can cause severe complications for mother and baby, even death. So it is important to diagnose it early.

Clinical features

- Polydypsia (excessive thirst)
- Polyuria (frequent micturition)
- Weight loss, fatigue
- Baby is bigger than expected or previous big baby
- Previous unexplained still birth

Diagnosis

- glucose in urine positive (glycosuria)
- Blood glucose high

You might find glycosuria on a routine antenatal urine check or when you already suspect diabetes.

Management in the Hospital

- Sugar-free diet
- Referral to a hospital as soon as possible
- She has to remain under doctor's supervision during pregnancy and delivery (there are many complications: high blood pressure, eclampsia, big baby, intrauterine death, hypoglycaemia of the baby after birth, etc.)
- probably be induced early

7. HYPERTENSION, PRE-ECLAMPSIA AND ECLAMPSIA

Hypertension can pre-exist before or start during pregnancy. Pre-eclampsia is defined as hypertension combined with proteinuria and/or oedema any time after 20 weeks of pregnancy. Eclampsia is the presence of convulsions in a patient with pre-eclampsia. It can cause death of baby and mother if not managed well.

RISK FACTORS

- First pregnancy
- Associated diseases:
 - o Diabetes
 - o Pre-existing hypertension
 - o Renal disease
- Very young age, or more than 40 years
- Twin pregnancy

7.1. MILD PRE-ECLAMPSIA

Clinical features

- BP 140 / 90 or lower
- Proteinuria : trace or + (one plus)
- Oedema positive or negative

Management

- Rest at home (if living reasonably near the clinic)
- Weekly follow up for:
 - o Blood pressure
 - o Urine for protein
 - o Weight and oedema
 - o Foetal size and well-being

If the condition gets worse, refer.

- Explain to the mother and relatives to come immediately if any of the following danger signs occur:
 - o Headache
 - o Blurred or otherwise changed vision
 - o Increasing swelling / oedema
 - o Restlessness
 - o Epigastric pain, nausea and vomiting
 - o Oliguria
 - o Reduced foetal movements
- Admit at 38 weeks for delivery

7.2. MODERATE PRE-ECLAMPSIA

Clinical features

- BP 150 /100 or higher
- Proteinuria ++
- Oedema ++

Management: Hospital

- Admit
- Limit activities
- Check BP twice daily
- Daily urine for protein (increasing proteinuria is a bad sign)
- Foetal kick count chart

- Methyldopa 250 mg 4 times daily, increase to 500 mg if needed. (Maximum dose 3gm daily)
- If not improving or deteriorating deliver immediately. (NOTE: Danger Signs)

7.3. SEVERE PRE-ECLAMPSIA

Clinical features

- Bp 160 / 110 or higher
- Proteinuria ++ or more
- Oedema ++
- Headache
- Epigastric pain, vomiting
- Blurred vision
- Excessive weight gain

Remember that not always all signs are present, play safe, if there are any signs of severe pre-eclampsia observe closely.

Management Hospital

- At the PHCC, refer to hospital urgently
- Bed rest in a quiet place but close to a nurse
- Monitor input / output
- Lower blood pressure:
 - o If BP > 110mm diastolic or 170 mm systolic, give Hydralazine 10 mg IV
 - o Check BP hourly
- Deliver the baby as soon as possible
 - o Do a vaginal examination to see if cervix is favourable for delivery
 - o If favourable for vaginal delivery, rupture the membranes and start Oxytocin
 - o If not favourable do a caesarean section
- Give Diazepam and Hydralazine
- Guarantee proper analgesia in labour, e.g Pethidine. Combine it with Promethazine if vomiting occurs
- Check BP every half an hour before, during and after delivery for at least 24 hours
- Give Magnesium sulphate IM when the woman goes into labour or when you start inducing to prevent convulsions
- Do **NOT** give Ergometrine!

Drug	H F	Dose	Frequency	Duration
Methyldopa 250 mg	H	250-500 mg	4 times daily	As long as needed
Diazepam 10 mg injection	C/ H	10 -20 mg as a bolus	Stat dose	
		40 mg in 500 ml saline as a slow infusion	Titrate slowly to reach adequate sedation	As long as needed
Hydralazine 25 mg injection	H	10-20 mg IV as a bolus	Stat dose	
		Repeat 12.5 mg 2 hourly as needed		As long as needed
Pethidine* 50 mg injection	H	50 mg IM / IV	Single dose	
Tramadol* 50 mg injection	H	50 mg IM / IV	Single dose	
Promethazine 25 mg injection	H	25 mg IM / IV	Single dose	
Magnesium sulphate 0.5gm/ml	H	initially 4 g IV followed <i>either by intravenous infusion</i> , 1 g/hour <i>or by deep IM</i> 5 g into each buttock and then 5 g into alternate buttocks if seizure occurs, additional dose <i>by intravenous injection</i> of 2 g	over 5–15 min for 24 hours as a bolus every 4 hours for 24 hours	

Before each administration of Magnesium sulphate, check that:

- Respiratory rate (RR) is at least 16 per minute
- Urinary output is at least 30 ml per hour over the last 4 hours.

Delay the drug if:

- RR gets less than 16 per minute
- Urinary output is less than 120 ml (4x30) in the last 4 hours.

In case of respiratory arrest:

- Assist ventilation

Give antidote: Calcium Gluconate 1 g (=10 ml of 10% Solution) IV slowly.

- ***Note: if the mother delivers within 4 hours after the opium derivate observe the baby closely for respiratory depression***
- ***If needed give Naloxone (see neonatal chapter)***

7.4. ECLAMPSIA

In this condition the patient is convulsing. Remember a small proportion of women with eclampsia have normal blood pressure. Treat all pregnant women with convulsions as eclampsia until another diagnosis is confirmed.

ACUTE MANAGEMENT AT ALL LEVELS

- Admit in the labour room
- Place patient on her left side
- Clear the airway, introduce a plastic airway
- Put up a stable IV line
- First choice of treatment and prevention of convulsions is Magnesium Sulphate (see protocol above)
- If Magnesium Sulphate is not available or the patient is admitted in a PHCC, administer Diazepam 10 mg IV immediately. Repeat Diazepam 10 mg if seizure activity persists after a few minutes (see schedule below)
- Insert a Foley's catheter
- If not in hospital refer urgently
- Administer analgesia before transport e.g. Pethidine
- Never leave the patient alone!

FURTHER MANAGEMENT AT THE HOSPITAL

- Assess mother and foetus
- Monitor BP every half hour
- Monitor input / output
- If BP is 110 diastolic or more administer Hydralazine 20 mg IV stat, then 12.5 mg 2 hourly as needed
- Determine mode of delivery immediately

- Continue management as in 6.3.
- Continue sedation and analgesia for at least 24 hours.
- Continue close supervision after delivery. A mother can continue to have convulsions after delivery
- Continue 2 hourly BP check for 48 hours

Protocol Diazepam

Loading dose:

- Diazepam 10 mg IV slowly over 2 minutes
- If convulsions recur repeat loading dose
- (If IV is not possible give 20 mg in a 10 ml syringe connected to a piece of tubing rectally, leave syringe in place and hold buttocks together for 10 minutes)

Maintenance dose

- Put up 500 ml Normal Saline with 40 mg Diazepam and run slowly. The patient should remain sedated but rousable
- Do not give more than 30 mg per hour and not more than 100 mg over 24 hour

In case of respiratory arrest:

- Stop the drip with diazepam
- Assist ventilation

II ABORTIONS

This is the loss of the pregnancy mostly in the first 18 weeks. Often it occurs spontaneously; in some cases it is induced. There are many types / stages.

1. THREATENED ABORTION

Clinical features

- Vaginal bleeding
- Little or no abdominal pain
- Size of uterus corresponds with dates
- Cervical os is close

Management

- Rest at home
- No sexual intercourse till 2 weeks after bleeding has stopped
- No other treatment has been proven useful

2. INCOMPLETE ABORTION

Clinical features

- History of amenorrhea
- Vaginal bleeding (may be heavier)

- Cramps, lower abdominal pains
- Some products of conception may have passed
- Cervical os is open
- Only do a vaginal examination in sterile conditions: then often remaining products can be felt. Remove them if possible

Examination:

- Measure Hb
- Malaria test
- Syphilis test
- Look for signs of induced abortion / sepsis

Management Hospital

- Explain that the pregnancy can no longer be saved
- Starve the patient for evacuation
- Evacuate the products
- Counselling
- Treat anaemia, malaria and/or syphilis if needed
- If there are signs of infection: Amoxicillin + Metronidazole

Drug	HF	Dose	frequency	duration
Amoxicillin	C/H	500mg	3 times daily	7 days
Metronidazole	C/H	400mg	3 times daily	7 days

3. COMPLETE ABORTION

Clinical features

- History of amenorrhea
- History of bleeding and passage of products
- Bleeding at time of examination and pain is minimal
- Cervical os is closed

Management

- Treat anaemia, If very anaemic, ill or in shock refer to hospital
- Provide counselling

4. SEPTIC ABORTION

This is an incomplete abortion with infection, often induced illegally

Clinical features

- Signs and symptoms of incomplete abortion
- Fever

- Offensive vaginal discharge
- Tenderness on palpating abdomen
- At times herbs or other foreign bodies are found in the vagina/cervix

Management Hospital

If pt. not very ill:

- Amoxicillin + Metronidazole
- Evacuation
- Counsel on family planning before discharge

Management if pt. very ill / septic / signs of peritonitis

- Admit
- IV fluids
- Nothing by mouth
- Ampicillin IV+ Gentamicin IV + Metronidazole IV
Or: Chloramphenicol IV + Metronidazole IV
- Transfuse blood if needed
- Evacuate the uterus soon after initial antibiotic doses
- Observe closely for peritonitis / pelvic abscess

Drug	HF	Dose	frequency	duration
Amoxicillin	C/H	500 mg	3 times daily	7 days
Metronidazole IV				
Metronidazole *	C/H	400 mg	3 times daily	7 days
Ampicillin IV	H	500mg	4 times daily	7 days
Gentamicin IV	H	80 mg	3 times daily	7 days
Chloramphenicol** IV	H	500 mg	4 times daily	7 days

**Chloramphenicol and Metronidazole can be changed to oral if the patient is improving

5. MISSED ABORTION

This means that the foetus has died, but the products of conception have not been expelled

Clinical features

- Spotting at times
- Feeling “less pregnant” (less nausea, less tension of breasts)
- Uterus small for dates

Management: PHCU/PHCC/Hospital

- In general it is reasonable to wait, especially in early pregnancy

- In more advanced pregnancy or if the mother is distressed about waiting refer to hospital for evacuation

6. MOLAR PREGNANCY

This is an abnormal pregnancy, there is no foetus and the placenta shows abnormal growth.

Clinical features

- vaginal bleeding can be substantial
- passing a “grapes” like substance
- no foetal movement even in a big uterus

Management:

- Refer urgently
- Confirm with ultra sound if possible
- Resuscitate the patient if in shock
- Treat the anaemia
- Recommend a hormonal FP method for at least a year
- Put up Oxytocin drip, then evacuate the uterus
- Give Ergometrine IV after the evacuation

7. ECTOPIC PREGNANCY

Ectopic or extrauterine pregnancy is a pregnancy outside the uterine cavity, mostly in one of the tubes. There can be an acute rupture or a more chronic (slow leaking) type.

Clinical features

ACUTE RUPTURE

- Period of amenorrhoea, the patient may think she is pregnant
- Lower abdominal pain, often acute followed by slight vaginal bleeding
- If the tube ruptures, the patient may suddenly go into shock
- Abdomen can be very tender on palpation
- There may be signs of free fluid in the abdomen

CHRONIC RUPTURE

- Abdominal pain
 - Irregular vaginal bleeding
 - Anaemia, fainting attacks, rapid pulse
 - Lower abdominal tenderness and possibly a mass
- Cervical excitation present and mass mostly in the tube

Differential diagnosis

- (threatened) abortion
- twisted ovarian cyst
- appendicitis
- Pelvic Inflammatory Disease (PID)
- Urinary Tract Infection (UTI)

Investigations

- History is very important! (amenorrhoea, spotting, abdominal pain)
- Mainly a clinical diagnosis
- Pregnancy test, if negative consider other diagnoses, though it can be negative at times in an ectopic pregnancy
- Ultrasound can be useful to exclude intra uterine pregnancy
- Set up an IV line and run slowly with normal saline and plasma expanders
- Refer urgently to a hospital
- Hb, blood group and cross match
- Start blood transfusion if needed (consider auto transfusion)
- Urgent laparotomy
- On discharge give Ferrous and Folic acid
- Counselling and inform the patient on her chances for fertility

III COMPLICATION IN FIRST STAGE OF LABOUR

1. PREMATURE RUPTURE OF MEMBRANES (PROM)

PROM is rupture of membranes before start of labour, either preterm (<37 weeks) or at term

Clinical features

- Draining of clear amniotic fluid from the vagina, either in large amounts or gradual leaking
- No contractions

Examination

Never do a manual vaginal examination, It may cause infection
--

- Place a vaginal pad over the vulva and examine visually and by smell after 1 hour
- Spread the vulva with a sterile glove and let the patient cough, you may see a gush of fluid
- If you still have no evidence and you can do a sterile speculum exam look for fluid coming out of the cervix

Management

> 36 weeks Hospital

- If no contractions after 12 hours refer to hospital
- Give Benzyl penicillin 2 MU 4 times a day
- Induce with Oxytocin
- If no signs of infection after delivery stop the antibiotics

<36 weeks PHCC / Hospital

- Admit for rest and observation
- If there is a sign of infection, give Erythromycin / Amoxicillin for 7 days
- Give 4 doses of Dexamethasone IM six hourly to the mother to improve lung maturity of the baby
- Induce with Oxytocin at 36 / 37 weeks

If there are signs of infection (fever, smelly discharge)

- Give antibiotics as in infected labour
- Do not give steroids
- Refer to hospital immediately for delivery

If there is vaginal bleeding (more than a little show) with substantial abdominal pain

- Suspect abruption of the placenta

2. PREMATURE LABOUR

Premature labour is labour starting before 37 weeks of pregnancy.

Clinical features

- Pregnancy less than 37 weeks
- Contractions
- Possible rupture of membranes

Management

- Rest
- Look for causes for the premature labour, such as
 - Malaria or other febrile illnesses
 - Polyhydramnios
 - UTI
 - Twins
- Treat concurrent diseases
- Salbutamol can be given as a trial
- Give Dexamethasone to the mother four times 6 hourly
- If the membranes are ruptured see 3.6.
- If delivery is unavoidable:
 - Keep the baby warm (Kangaroo method)
 - Prevent hypoglycaemia
 - See chapter 5, Pg 131 - the preterm infant

Drug	HF	Dose	frequency	duration
Salbutamol	C/H	4 mg	3 times daily	As long as needed
Dexamethasone	H	6 mg	every 6 hours	4 doses only

3. ANTE PARTUM HAEMORRHAGE (APH)

Vaginal bleeding occurring after 28 weeks of pregnancy

Causes

- Local causes from the genital tract (e.g. trauma, cancer, polyps)
- Placenta praevia: all or part of the placenta is found in the lower segment of the uterus
- Abruptio of placenta: premature separation of a normally placed placenta
- Ruptured uterus: especially in a patient with a previous caesarean section and/or abnormal lie

Clinical features:

Placenta praevia	Abruptio of placenta
Painless	Severe pain
Foetal movements usually present	Loss of foetal movements common
Open bleeding from the vagina	Open bleeding may be absent (bleeding is behind the placenta)
Shock and anaemia if heavy bleeding	Shock and anaemia, even when no open bleeding
Uterus soft, not tender	Uterus hard and tender
High presenting part	Foetal parts difficult to feel because of hard uterus
Foetal heart usually heard	Foetal heart often absent

Management PHCC

- Insert an IV line
- Explain to the patient and relatives
- Refer urgently
- Accompany the patient to keep her stable

Management hospital

Examination

- General assessment of mother and foetus
- Hb, blood group and cross matching
- Ultrasound
- No manual vaginal examination!!!

MANAGEMENT OF PLACENTA PRAEVIA

- Resuscitate the mother
- If less than 36 weeks and bleeding minor:
 - Admit
 - Observe
 - Rest
- If more than 36 weeks and bleeding minor:
 - If on ultrasound major degree of placenta previa seen, then plan caesarean section at 37 weeks
- If more than 36 weeks and major bleeding:
 - Caesarean section (CS) immediately
 - Keep blood for transfusion ready
- Never give spinal anaesthesia if the patient is in shock
- Consider Ephedrine routinely before CS of a placenta praevia
- Keep Oxytocin drip going after delivery/CS
- Administer Ergometrine IV immediately after delivery

Use of Oxytocic drugs after delivery

	Oxytocin	Ergometrine/ Methyl Ergometrine
Dose and route	IV: infuse 20 units in 1litre Dextrose 5% at 60 drops per minute	IV (slowly); 0.2 mg
	IM: 10 Units	IM: 0.2 mg
Continuing dose	IV: Infuse 20 Units in 1 litre IV fluids at 40 drops per minute	Repeat 0.2 mg IM or IV after 15 minutes. If required give (slowly) every 4 hours)
Maximum dose	Not more than 3 litres containing Oxytocin	5 doses (total 1 gram)
Precautions /contraindications	Do not give as an IV bolus	Pre-eclampsia, hypertension, heart disease

Management of abruption of placenta

- Rule out placenta praevia
- Confirm there is no foetal heart beat
- Rupture the membranes artificially
- Induce with Oxytocin
- Indications for caesarean section
 - o Foetal heart beat present
 - o Life threatening bleeding
 - o Others, like transverse lie etc.
- Fresh blood is preferable for transfusion rather than packed cells
- Keep Oxytocin drip going after delivery/CS
- Give Ergometrine IV immediately after delivery

Every patient with APH is at high risk for PPH, observe closely and keep IV line in place for a minimum of 24 hours

4. INFECTED LABOUR - CHORIOAMNIONITIS

Infection of amniotic membranes / fluid before delivery

Clinical features

- History of vaginal draining of liquor
- Fever
- Foul- smelling vaginal discharge
- Often patient had several vaginal exams before arrival in the clinic
- Abdominal pain
- Patient can be in labour or not

Management

- Give Ampicillin + Gentamicin IV
- Preferably deliver vaginally and as soon as possible!!
- If not in labour or not progressing, induce with Oxytocin independent of maturity
- After delivery continue antibiotics till the mother is free of fever for 48 hours
- If she has a caesarean section, continue antibiotics and add Metronidazole for 48 hours until the fever is reduced
- If newborn sepsis is suspected, start the baby on antibiotics (see neonatal sepsis)

Drug	HF	Dose	frequency	duration
Ampicillin IV/IM	C/H	500mg	4 times daily	Until the patient can take oral
Gentamicin IV/IM	C/H	5-7/kg/day in 2 divided doses	2 times daily	3days minimal
Amoxicillin	C/H	500mg	3 times daily	8-10 days
Metronidazole IV 5mg/ml	H	100 ml, slowly over 20 minutes	3 times daily	Until patient can take oral
Metronidazole po	C/H	400mg	3 times daily	8-10 days

5. OBSTRUCTED LABOUR

Failure of labour to progress despite good contractions

Causes

- Any failure of descent of the baby down the birth canal
- Large baby
- Mal-presentation or mal-position

Clinical features

- Contractions are strong but no descent of the presenting part
- On abdominal or vaginal exam mal-position or mal-presentation can be detected
- In late stages the contractions may stop when the uterus is ruptured and the pain becomes continuously

Management PHCC

- Hopefully you have seen this woman during ANC, suspected a baby too big for her pelvis, twins or mal-presentation and referred her before labour
- If not, put up an IV line with Dextrose 5% and refer immediately

Management Hospital

- Confirm diagnosis of obstructed labour
- Resuscitate the woman
- Hb, Blood group, cross match
- If foetal heart beat is present prepare for urgent CS:
 - Insert a reliable IV line
 - Give 500 ml fluids fast
 - Give preoperative IV antibiotics as a single dose e.g Ampicillin or
 - Insert an indwelling catheter
 - Keep the patient starved

- Chloramphenicol
- Give Atropine 0.6 mg only
- If the woman has many children or had two or more previous caesarean
- sections counsel about tube ligation
- If there is no foetal heart beat (this must be assured by double checking) conduct a destructive operation under anaesthesia. Explain to mother and relatives before the procedure. If no foetal heart and suspicion of ruptured uterus do a laparotomy
- After a caesarean section a mother has to deliver in hospital each time!

6. RUPTURED UTERUS

Partial or complete tearing of the uterus mainly in multiparous women and/or women with a previous CS.

Causes/Risk factors

- Obstructed labour
- Previous CS scar
- Improper use of Oxytocin
- Grand multiparity, especially with mal-presentation

Clinical features

- Labour pains have stopped
- Continuous abdominal pain
- Vaginal bleeding
- Anxiety, anaemia and shock
- Abdomen is irregular in shape
- At times foetal parts can be felt under the skin if the foetus is outside the uterus
- Foetal heart mostly not heard

Management

- Resuscitate the mother
- HB, Blood group, cross match, transfusion
- Catheterise
- Prepare the patient & obtain consent for a hysterectomy and/or tube ligation
- It is very dangerous to get pregnant again
- To theatre for laparotomy urgently
- During the surgical procedure decide on repairing the tear or a hysterectomy

7. MECONIUM STAINED LABOUR

Liquor is normally a watery opaque substance, in case of meconium (=early stool of the foetus) it gets green.

- Slightly green meconium does not need direct intervention, but is a warning to watch the labour and the foetal heart carefully for signs of foetal distress
- Thick meconium is definitely a sign of foetal distress and needs delivery as soon as possible. If this is not likely in a PHCC refer to the hospital
- In case of immediate delivery prepare for resuscitation of the baby or ask assistance. After delivery clean nose and mouth and suction if needed as soon as possible before the baby aspirates

IV COMPLICATIONS IN SECOND STAGE OF LABOUR

As mentioned in the beginning of this chapter the dealing of twins, breech, shoulder dystocia etc. fall outside the mandate of this manual. Consult a good midwifery book or manual.

V COMPLICATIONS IN THIRD STAGE OF LABOUR

1. POST PARTUM HAEMORRHAGE (PPH)

PPH is severe vaginal bleeding after delivery

-primary PPH occurs in the first 24 hours

-secondary PPH occurs between 24 hours and 6 weeks

1.1. PRIMARY PPH

Risk factors

- Prolonged labour
- Grand multiparity
- Past history of PPH or retained placenta
- Multiple pregnancy
- Infected labour
- Antepartum haemorrhage (APH)

Causes

- Atony of the uterus, failure of uterus to contract
- Ruptured uterus
- Tears / lacerations in perineum, vagina or cervix
- Retained placenta, incomplete placenta
- Full bladder

Management PHCC

- Rub the uterus
- Ensure that the bladder is empty, catheterise if needed
- Put up an IV line
- Administer Ergometrine / Oxytocin IV stat
- If it is not possible to obtain an IV line, then administer by IM route
- Establish the cause of bleeding
- If from perineum, vagina or cervix, suture
- Check if the placenta is complete
- If placenta is retained or incomplete try manual removal
- If any sign of infection start antibiotics
- If no improvement refer to hospital

Management at the Hospital

If there is no improvement after above measures:

- Check for Hb, blood group and cross match
- Resuscitate the mother
- Consider sepsis if there is fever and smelly lochia
- Consider a ruptured uterus in:
 - o Previous CS
 - o Prolonged labour in a multigravida

Use of Oxytocic drugs after delivery

	Oxytocin	Ergometrine/ Methylergometrine
Dose and route	IV: infuse 20 units in 1liter Dextrose 5% at 60 drops per minute	IV (slowly); 0.2 mg
	IM: 10 Units	IM: 0.2 mg
Continuing dose	IV: Infuse 20 Units in 1 litre IV fluids at 40 drops per minute	Repeat 0.2 mg IM or IV after 15 minutes. If required give (slowly) every 4 hours)
Maximum dose	Not more than 3 litres containing Oxytocin	5 doses (total 1 gram)
Precautions /contraindications	Do not give as an IV bolus	Pre-eclampsia, hypertension, heart disease

1.2. Secondary PPH

Secondary PPH is usually due to infection, retained products or a combination of the two

Management

- Insert an Oxytocin drip
- Give Ergometrine IV (see above)
- Check for fever, anaemia, uterus size, bleeding, smelly lochia
- Hb, blood group and cross match
- In case of infection start on Ampicillin + Gentamicin
- If there is no relief after 48 hours add Metronidazole IV
- Switch to oral Amoxicillin + Metronidazole as soon as possible
- If suspicion of retained products evacuate the uterus gently (keep Oxytocin drip going during the procedure)

Use of Oxytocic drugs after delivery

Drug	HF	Dose	frequency	duration
Ampicillin IV/IM	C/H	500mg	4 times daily	Until the patient can take oral
Gentamicin IV/IM	C/H	5-7/kg/day in 2 divided doses	2 times daily	3days minimum
Amoxicillin caps	C/H	500mg	3 times daily	8-10 days
Metronidazole IV 5mg/ml	H	100 ml, slowly over 20 minutes	3 times daily	Until patient can take oral
Metronidazole Oral	C/H	400mg	3 times daily	8-10 days

2. RETAINED PLACENTA

Failure of delivery of the placenta within 1 hour of the delivery of the baby

Causes

- Failure of uterus to contract
- Failure of placenta to separate (e.g. stuck in uterine muscle)
- Closure of the cervix before the placenta is expelled

Clinical features

- The umbilical cord protrudes from the vagina
- Bleeding may be present (in case of partial separation)

- The uterus may be poorly contracted and high in the abdomen
- If the placenta is retained for a prolonged period there may be signs of infection: fever, smelly discharge

Management

- Always exclude second twin
- If you can see the placenta ask the mother to push it out
- Ensure that the bladder is empty, if not catheterise
- Try controlled traction
- If this fails administer Oxytocin 10 IU intramuscularly

Do not give ergometrine because it causes tonic uterine contraction which may delay expulsion. Do not use fundal pressure

- Repeat trial of controlled contraction after 30 minutes
- In a PHCC, if the patient is not bleeding you can wait up to 4 hours, then refer
- If you cannot refer or the patient is bleeding try manual removal
- Manual removal:
 - o Start an IV line
 - o Give Diazepam and Pethidine 25mg/ml slowly IV (do not mix in the same syringe)
 - o Give a single dose of antibiotics, e.g. Ampicillin + Metronidazole
 - o Try manual removal of placenta using the ulnar surface using the right hand. Initially be guided by the cord. Support the uterus with the left hand and try to separate gently. Practice high standards of infection prevention, use long gloves.
- If unsuccessful take the patient to theatre for further attempts, it may be stuck in the muscle

3. PUERPERAL SEPSIS

Infection of the female genital tract, within 6 weeks of childbirth or abortion

Clinical features

- Persistent fever $> 38^{\circ}\text{C}$
- Pain in the lower abdomen
- Persistent bloody / pussy lochia, often smelly
- Tenderness on palpating the uterus

Investigations

- Exclude other causes of fever
- Abdominal examination for size and tenderness of uterus

- Vaginal examination: Cervix open, any signs of retained products, watch and smell the lochia

Management:

- If the patient is very ill keep them on IV fluids and nil by mouth
- Ampicillin + Gentamicin IV
- If fever persists for 48 hours add Metronidazole IV
- Give Paracetamol for pain
- After improving switch to Amoxicillin + Metronidazole oral
- Continue antibiotics 7-10 days
- If very anaemic transfuse blood
- Look for retained products and evacuate uterus if needed
- Provide counselling and testing

Drug	HF	Dose	frequency	duration
Ampicillin IV/IM	C/H	500mg	4 times daily	Until the patient can take oral
Gentamicin IV/IM	C/H	5-7/kg/day in 2 divided doses	2 times daily	3days minimum
Amoxicillin caps	C/H	500mg	3 times daily	8-10 days
Metronidazole IV 5mg/ml	H	100 ml, slowly over 20 minutes	3 times daily	Until patient can take oral
Metronidazole Oral	C/H	400mg	3 times daily	8-10 days

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NEONATAL CONDITIONS

5.1. CARE OF THE NORMAL NEWBORN

- Room and wraps should be warm before delivery
- Wipe mouth and nose (do not give suction to a normal child) before the child breathes
- Clamp and cut the cord
- Dry the baby, Wrap in dry linen and keep baby warm
- Examine the baby and look for congenital abnormalities
- Weigh the baby
- Instil Tetracycline eye ointment in both eyes once
- Give him / her to the mother, start breastfeeding within half an hour
- Feed on demand but at least 8 times/24 hours
- No bottle feeding, no other substances

5.2. RESUSCITATION OF A FLAT BABY

Serious problems

- Not breathing or gasping
- Breathing with difficulty (Respiratory rate $<30/\text{min}$ or $>60/\text{min}$, grunting, indrawings) esp. in presence of thick meconium
- Cyanosis (baby is blue)
 - Hypothermia
- Lethargy
 - Convulsions
- Very preterm (<32 weeks) or very low birth weight (<1500 gram)

Management of no / or poor breathing and cyanosis:

- Move the baby to a warm surface under a heater or keep warm in another way
- Place the baby on his/her back with the head slightly extended
- Suction first mouth, then nostrils
- If the baby starts crying / breathing, proceed with normal care
- If still not breathing, ventilate with a mask / ambu bag
- If heartbeat not present or is slow do cardiac massage and continue to ventilate
- If the mother had Pethidine or Morphine or Tramadol less than 4 hours before delivery give Naloxone as an antidote to the baby

Drug	HF	Dose	frequency	duration
Naloxone	H	0.1 mg/kg IV	once	

5.3. THE PRETERM INFANT

An infant who has not finished 37 weeks of intrauterine life

PROBLEMS RELATED TO PREMATURITY

- Hypothermia
- Respiratory distress
- Hypoglycaemia
- Infections
- Jaundice
- Congenital abnormalities

Management

- Assess maturity
- Look for congenital abnormalities
- Keep warm, wrap quickly in warm cotton
- The best method in Sudan to keep a preterm baby warm is the Kangaroo method: wrap the baby up with the mother and let them have body contact 24 hours a day
- Feeding should be done within 3 hours to prevent hypoglycaemia
- Babies below 1500 gram need a naso-gastric tube and then be fed 2-3 hourly with expressed mother milk according to feeding chart, they are too weak to suck enough on their own
- Above 1500 gram the baby can try breast feeding or EBM with cup and spoon
- Weigh on alternate days, if no weight gain, insert NG-tube
- Look for infections, especially if the mother was infected or had prolonged rupture of membranes
- If you suspect infection or if the baby has not gained weight for several days start on antibiotics.
- Keep in hospital till (s)he is 2500 gram
- Note: a healthy baby is allowed to lose some weight in the first 5 days of life, do not allow this in a baby with a low birth weight
- A guideline for feeding is in the chart below. If the child is well you can increase daily

Feeding chart

Amount of milk to give every 3 hours (in ml)								
DAY	1	2	3	4	5	6	7	8
Birth wt (in kg)								
1.0-1.4	8	10	15	20	25	30	30	35
1.5-1.9	10	15	20	25	30	40	45	50
2.0-2.4	15	20	30	35	40	50	55	65
2.5-2.9	20	25	35	40	50	60	70	75
3.0-3.4	20	30	40	50	60	70	70	75
3.5-3.9	25	35	45	60	70	80	80	80

In children above 2 kg this feeding chart is only relevant for orphans and babies unable to suck, the rest should be breast fed on demand.

5.4. NEONATAL SEPSIS / MENINGITIS

It is often difficult to differentiate between sepsis and meningitis, signs like bulging fontanel and stiff neck are mostly absent in neonates.

Causes / risk factors

- Mother with infected labour, prolonged rupture of membranes
- Delivery by untrained birth attendant

Clinical features

- Temperature instability (either fever or hypothermia)
- Lethargy, irritability
- Jaundice
- ,convulsions
- Vomiting, abdominal
- Respiratory distress
- distension

Management

- Immediate antibiotics, preferably IV, if not possible IM
- Ampicillin and Gentamicin for 5 days
- In case of suspicion of meningitis increase to 14 days and add Chloramphenicol

Drug	HF	Dose	Age baby	frequency	duration
Ampicillin IV/IM	C/H	50mg/kg	< 7 days > 7 days	twice daily three times daily	5 days for sepsis, 14 days for meningitis
Gentamicin IV/IM	C/H	2,5 mg/kg		Twice daily	
Chloramphenicol IV	C/H	12.5 mg/kg	< 7 days > 7 days	twice daily three times daily	14 days

5.5. NEONATAL CONVULSIONS

Most neonatal convulsions are caused by hypoglycaemia, but try to exclude meningitis.

Management

- If possible check blood glucose, if <2.2mmol/l give Dextrose 50 % immediately then put in an NG tube and start feeding expressed breast milk
- If glucose testing is not possible and there is no D50% give expressed breast milk by NG tube 10-20 ml initially and continue normal requirement every two hours. (do not give D50% by NG tube)
- Administer Diazepam 0.3mg/kg IV or rectally
- Do a lumbar puncture if possible
- Administer antibiotics (see table above)
- Administer Phenobarbitone oral once daily

Drug	HF	Paediatric Dose per kilo weight
Dextrose 50%	H	1 kg = 1ml D50% mixed with 1ml water for injection 2 kg = 2ml D50% mixed with 2ml water for injection etc.
Diazepam IV / PR (10 mg/2ml)	C/H	1 kg = 0.3 mg = 0.06 ml 2 kg = 0.6 mg = 0.12 ml 3 kg = 0.9 mg = 0.18 ml 4 kg = 1.2 mg = 0.24 ml 5 kg = 1.5 mg = 0.30 ml
Phenobarbitone oral (NGT)	C/H	1 kg = 5mg once daily 2 kg = 10 mg once daily 3 kg = 15mg once daily 4kg = 20 mg once daily 5 kg = 25 mg once daily

5.6. NEONATAL JAUNDICE

Many babies have some jaundice in the first week of life. It starts on day 3, is worst on day 5 and reduces in about a week

It is abnormal when it starts on the first day; baby is very yellow and/or lethargic.

Causes

- Prematurity
- Rhesus incompatibility (this is if the blood group of the mother is negative, and the baby positive)
- Sepsis
- Haemolysis of a big haematoma (after a difficult delivery)

Examinations

- Hb, blood group mother and baby
- Any signs of infection / sepsis
- Any big haematoma

Management

- In rhesus incompatibility refer urgently to hospital, it probably needs an exchange transfusion and the mother needs an anti D injection
- In suspected sepsis start on antibiotics, feed by NG-tube if needed
- Expose the baby to the sun for short periods with a maximum of 2 hours a day. Shade the eyes with a loose bandage. Continue daily till the jaundice is less.

5.7. CONJUNCTIVITIS OF THE NEW BORN

The severe form is usually caused by gonorrhoea from the mother.

PREVENTION:

Avoid this condition by training midwives to clean the eyes after delivery and applying Tetracycline eye ointment.

If infection occurs

- Eyes are not necessarily red
- Eyelids are swollen and on opening there is usually a lot of pus

TREATMENT: TREAT IMMEDIATELY

- Ceftriaxone 50mg/kg (max. 125mg) IM single dose
- Begin treatment before referral

- Wash the eyes out repeatedly with clean water. Apply antibiotic eye ointment hourly
- Repeat washing and antibiotic EVERY HOUR - DAY and NIGHT until the pus stops
- Also treat the mother and her partner for gonorrhoea

5.8. CONGENITAL ABNORMALITIES

5.8.1. HYDROCEPHALUS

Hydrocephalus is a uniform enlargement of the head caused by an increase in the volume of cerebro-spinal fluid.

Clinical features before delivery

- Unusual large head
- Failure of the head to descend in to the pelvis
- Very wide tense and bulging fontanelles
-

Management

This is an ethical dilemma, it will be impossible for the baby to deliver vaginally. If it is impossible to reach a hospital in reasonable time it is better to perforate the head with a sharp scissor, let the fluid come out and it will be possible to deliver it easily, but obviously the baby will not be alive (guide the scissors carefully in order not to damage the mother, use hand support to do this). However, at least the mother will be saved.

If in a hospital the case must be carefully discussed with the relatives and other medical colleagues. The dilemma will be to do a difficult caesarean section for a baby with very limited chances of survival especially in Sudan or to opt for a destructive operation.

5.8.2. SPINA BIFIDA

There will be a bulge on the back, sometimes covered with skin, sometimes only with a membrane. At times it is accompanied by a hydrocephalus. Below the bulge the vertebrae are separated. If the spina bifida is small the nerves might be intact and the child may grow up normally. If the underlying nerves are damaged the child will be incontinent and often unable to walk. An operation will close the skin but not repair the nerves.

Management

- Explain the condition to the parents
- The higher the lesion the less the chances of survival
- If the defect is not covered with skin, bandage it with sterile paraffin gauze
- Send to a hospital for assessment
- These days a lot can be done in rehabilitation: callipers, self catheterisation, etc.

5.8.3. CLEFT LIP / CLEFT PALATE

Cleft lip and cleft palate may occur separate or in combination.

Management

- Try breast feeding, some babies can suck, but for most of them it is difficult to suck (enough). If so teach the mother how to express breast milk and give it by spoon. Use feeding table in 4.3.
- Children with a cleft palate can get respiratory infections easily. Treat quickly
- Monitor the weight closely
- If in good condition refer for repair of the lip at about 3 months of age
- Repair of the palate is best at 12 – 15 months

5.8.4. CLUB FOOT

The baby may be born with either one or both feet in a fixed deformed position.

- Start correcting the position from day one. Tell the mother to put the foot in the normal position every hour for 5 minutes
- Try to strap the foot in a normal position, do it, remove the strapping daily, manipulate and strap again
- As soon as possible refer to a hospital for plastering
- If started early a lot of unnecessary operations can be avoided

5.8.5. CONGENITAL SYPHILIS

Signs can be:

- Generalized oedema
- Skin rash, blisters on palms or soles
- Rhinitis
- Anal condylomata
- Enlarged liver/spleen
- Paralysis of one limb
- Joint swelling and pain
- Jaundice/ pallor
- Syphilis test positive in child and/or mother

TREATMENT OF THE BABY

- No symptoms, but mother was positive for syphilis and treated during pregnancy: Benzathine Penicillin 1 dose only
- Congenital syphilis, baby has clinical signs:
Procaine penicillin for 10 days

Drug	HF	Dose	frequency	duration
Benzathine penicillin	C	30 mg/kg	One dose only	
Procaine penicillin	C	50 mg /kg IM (50.000u/kg)	Once daily	10 days

6.TUBERCULOSIS (TB)

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TUBERCULOSIS (TB)

INTRODUCTION

Tuberculosis is a chronic infectious disease, caused by a mycobacterium; it is spread by infected droplets through coughing. Occasionally it is caused by Mycobacterium bovis, which is transmitted by drinking raw milk from infected cows.

TB is acquired by close contact with a sputum positive patient. Extra vulnerable are children and people with low immunity. Among the people who get infected only about 10 % actually develop TB. The other 90 % have enough immunity to fight the disease and keep it 'dormant' (sleeping). It can be reactivated though when their immunity gets reduced.

This means that people with HIV will have more chance to get TB and amongst people with TB there will be an increased number of HIV +ve people. This will require integration of services in the health system.

TYPES OF TUBERCULOSIS

6.1. PULMONARY TB (PTB)

This can be divided into smear positive and smear negative TB.

Clinical features

- Chronic cough > 3 weeks
- Chest pain
- Purulent sputum, occasionally with blood
- Fever with night sweats
- Weight loss, loss of appetite
- Sometimes generalized enlargement of lymph nodes

Management

- If the patient has not had antibiotics administer one week of Amoxicillin
- During that same week do 3 sputum tests (ALWAYS DO 3!) The best sputum is coughed up early morning before the patient has eaten
- Strongly recommend an HIV test

SMEAR POSITIVE TB (PTB +ve)

If at least 2 out of 3 smears are positive, the patient has PTB. This patient has the bacilli in his/her sputum and is infectious therefore can spread the disease.

SMEAR NEGATIVE TB (PTB -ve)

Conditions for diagnosis:

- All signs of PTB are present (6.1.1)
- 3 sputum tests are negative
- no response to broad spectrum antibiotics
- Ideally an X-ray should be done, but if this is not available the diagnosis can be made by a medical doctor on clinical signs and symptoms

6.2. EXTRA PULMONARY TB (EPTB)

TB is found in other organs than the lungs. Three sputum tests should still be done to exclude PTB. Some patients can have both PTB and EPTB.

TB LYMPHADENITIS

Clinical features:

- Tender swelling of lymph nodes ,often in neck or axillae
- Often found in children and young people
- The nodes can be fluctuant, at times break through the skin and leave a sinus, or later a scar
- Night sweats
- Loss of weight , fatigue or failure to thrive

Differential diagnosis

- HIV/AIDS(or a combination of both)
- Kaposi sarcoma
- Metastases of a malignancy, etc.

Investigations:

- Aspiration from a lymph node can show Acid Fast Bacilli(AFB's) in about half of the cases
- A biopsy can be very helpful, even without a histological lab. Cut the node open after removing it. If you see caseation (a cheese like substance) it is diagnostic for TB. If it has a black content it is probably Kaposi Sarcoma

TB PLEURITIS / PERICARDITIS

Clinical features

- Cough and chest pain
- Fever, night sweats
- Dyspnoea
- Loss of weight, loss of appetite

Investigations

- If there is a good amount of effusion it can be detected by clinical examination
- X-ray and/or ultrasound are very useful for pleural effusion
- If a large amount of pleural effusion is found aspirate the fluid (slowly)
This has 2 purposes:
 - Diagnostic: If it is clear it is more likely to be TB, if it is pus it is caused by bacteria (empyema)
 - If the patient has a large amount of effusion (>500ml) slow aspiration gives him/her immediate relief from dyspnoea

Differential diagnosis

- asthma, emphysema
- congestive heart failure
- lung abscess, empyema
- malignancy
- post-pneumonic effusion

TB ASCITES

The TB is located in the peritoneal space and produces fluid

Clinical features

- fever, loss of weight, loss of appetite, night sweats
- distension of the abdomen
- on examination notable fluctuation of the fluid in the abdomen

Differential diagnosis

- cirrhosis (alcohol, hepatitis B, bilharzia)
- malignancy (ovary)
- other masses in the abdomen (cysts, pregnancy, etc)

SPINAL TB (POTT'S DISEASE)

This is a serious form of TB that needs to be detected early. It mostly affects children and teenagers. The TB is located in the vertebral bodies and if it advances the bodies can collapse and damage the spinal cord. This will leave the patient paralyzed below that level!

Clinical features

- backache
- fever, night sweats, loss of appetite, loss of weight
- angulation of the spine at the level of infection
- In advanced cases paralysis, incontinence, bed sores, etc.
- In the majority of cases high ESR (Non-specific)

Diagnosis can be confirmed with X-ray, but if X-ray facilities are not available the diagnosis has to be made clinically. Do not delay treatment!

MILIARY TB

The TB is disseminated to different sites in the body. It happens mainly to people with low immunity, like young children or people with advanced AIDS.

Clinical features

- Patient is very ill
- Fever, wasting, confusion
- In children failure to thrive, not responding to antibiotics, anti-malarials and adequate nutrition
- In children look for a close TB contact

TB MENINGITIS

Clinical features

- Headache, neck stiffness
- Confusion
- Fever
- Patient is very ill
- Usually has a slower onset than bacterial meningitis (over weeks)

DIAGNOSIS OF TUBERCULOSIS IN CHILDREN

Diagnosis in (young) children is often difficult. They rarely have smear positive pulmonary TB. Signs and symptoms are less specific, TB is often extra pulmonary and they cannot produce sputum. Gastric lavage does not give much help and should not be done as a routine. Mantoux test is also unreliable in children who had a BCG (Mantoux will be false positive) or children with a very low immunity due to malnutrition, post measles and some other virus infections or HIV (Mantoux will be false negative).

To help in the diagnosis the following score chart is developed. When the total score (xxx) is 7 or more and no other cause is found the patient should be treated for TB.

Score chart for diagnosis of TB in children

Feature	0	1	3	score
Length of illness	< 2 weeks	2-4 weeks	> 4 weeks	
Weight(for age)	> 80%	60-80%	< 60 %	
History of TB in Family	none	Reported by family	Proved sputum +	
Score for other features if present				
Features			Points	score
Positive Mantoux test			3	
Large painless lymph nodes, sinus present			3	
Unexplained fever, night sweats, no response to malaria treatment			2	
Malnutrition not improving after 4 weeks of treatment (with high energy diet)			3	
Angle deformity of the spine			4	
Joint or bone swelling, or sinuses			3	
Unexplained abdominal mass or ascites			3	
CNS: change in temperament, fits, coma			3	
Total score				xxx

TREATMENT OF TB

Case definitions

New case	Patient never had treatment for TB before or had anti TB drugs < 1 month
Relapse	Patient was previously treated and declared cured or treatment completed and who now has PTB +ve
Treatment after failure	Patient is started on re-treatment after failing previous treatment
Treatment after default	Patient with PTB+ve who was on treatment but interrupted treatment for >2 months
Transfer in	Pt transferred from another centre to continue treatment
Other	Any TB pt that does not fit in one of the above definitions

ANTI TB DRUGS IN SOUTHERN SUDAN TB PROGRAM

Abbreviation	Drug	Recommended dose and dose range (in mg/kg)
H	Isoniazid	5 (4-6)
R	Rifampicin	10 (8-12)
Z	Pyrazinamide	25 (20-30)
S	Streptomycin	15 (12-18)
E	Ethambutol	15 (15-20)

All drugs are given in one single dose in the morning.

Majority of the drugs are available in combination tablets of 2 or 3 drugs combined in one tablet (known as Fixed dose combination –FDC). This should make it easier for the patient to comply with the treatment.

The treatment always consists of an initial phase and a continuation phase.

In the short course chemotherapy recommended in Southern Sudan the first 2 months (the initial phase) the drugs have to be taken under supervision of a health worker. This means they have to be admitted either in a hospital or PHCC or – if they live nearby- they have to come every day to take their medicines under direct supervision (DOTS).

In the following months the patients can continue daily treatment at home under supervision and be followed up from the nearest PHCU/PHCC.

It is essential that a TB patient finishes the complete treatment!

This is why it is very important to have all data of the patient registered at the start of treatment: address, how the house can be found, closest relative etc. In case of defaulting you are then able to trace the patient.

TB Treatment categories

Category	TB patients	TB Treatment regimen, daily	
		Initial phase	Cont. phase
I	• All new AFB+ve TB • All severe EPTB	2HRZE	4HR
II	• Relapse, treatment failure and AFB+ve after default	2HRZES/1HRZE	5HRE
III	• All new AFB-ve TB • All non severe EPTB • Children with TB except for those in I and II	2HRZE	4HR

MONITORING PATIENT TREATMENT RESPONSE

NEW AFB +ve PATIENTS

Follow-up sputum checks need to be done:

- After 2 months: 2 sputum tests. This is to show sputum smear conversion from positive to negative. If the patient is still positive after 2 months continue the intensive phase for one more month. Check if he/she is taking the medicines regularly!
- After 5 months: 2 sputum tests to see if there are any treatment resistant bacilli. If the patient is still positive consider the treatment as a failure and start again with a full course of re-treatment (Category II)
- After 6 months 2 sputum tests to determine cure

PREVIOUSLY TREATED AFB +ve PATIENTS

Follow-up sputum checks need to be done:

- After 3 months: 2 sputum tests. This is to show sputum smear conversion from positive to negative. If the patient is still positive after 3 months continue the 4-drug treatment for one more month then check sputum again. Check if he/she is taking the medicines regularly!
- After 5 months: 2 sputum tests to see if there are any treatment resistant bacilli. If the patient is still positive if possible send sputum for culture and sensitivity and continue the continuation phase
- After 8 months: 2 sputum tests to determine cure

AFB -ve PTB AND EPTB

These patients must be monitored clinically. Usually weight gain is the best indicator. However, if AFB negative PTB patients are still coughing after 2 months do 2 sputum tests. The initial diagnosis might have been wrong, or the disease may have progressed.

If an initially sputum negative patient turns out to be positive after 2 months s/he should be restarted on full course as category II.

TREATMENT IN SPECIAL SITUATIONS

PREGNANCY

Streptomycin should not be given to pregnant women as it can affect the hearing of the foetus. All other anti TB drugs mentioned can be safely given in pregnancy.

BREAST FEEDING MOTHER

- All anti TB drugs are safe during breast feeding.
- When a mother is found positive during breast feeding the child should be given INH as prophylaxis (5mg/kg). BCG should be postponed until prophylaxis is completed.

ORAL CONTRACEPTION (THE FP PILL)

Rifampicin decreases the effect of the pill. Therefore if a woman wants full protection against pregnancy during her treatment she should either use a pill with a higher dose of oestrogen or a different FP method.

HIV/AIDS

Treatment of TB in HIV infected patients is the same as in HIV negative patients. It is good to strongly recommend (opt out testing) a HIV test to all TB patients to offer them further treatment and advice if necessary. (See chapter HIV/AIDS)

ADJUVANT PREDNISOLONE THERAPY

High doses of Prednisolone are beneficial to special patient groups:

- TB meningitis
- TB with large pleural effusion
- TB pericarditis
- TB laryngitis with airway obstruction
- Massive lymphadenopathy with signs of obstruction
- Severe hypersensitive reaction to anti-TB drugs

40-60 mg of Prednisolone can be given for four weeks and then the dose is gradually decreased over several weeks.

SIDE EFFECTS OF ANTI TB DRUGS

Side effects	Drugs probably responsible	Management
MINOR Anorexia, nausea, abdominal pain Joint pains Burning sensation feet Orange/red urine	Z, R Z, H R	Give drugs with small meals or before night. Give aspirin Pyridoxine Reassure patient
MAJOR Itching, rash Deafness	H,Z,R,S S	Stop all anti-TB drugs* Stop S, use E

Dizziness	S	Stop S, use E
Jaundice (exclude other causes)	H,Z,R	Stop anti-TB drugs**
Confusion due to liver failure	H,Z,R	
Visual impairment	E	Stop anti TB drugs
Shock, purpura, acute renal Failure	R	Stop Ethambutol Stop R

*when a patient develops itching without a rash, try with antihistamines and continue Rx. If a rash develops stop all TB drugs until the rash has disappeared, then reintroduce the drugs gradually one by one. Once the drug causing the reaction has been identified you can replace it.

**when a patient develops jaundice stop all drugs and wait for two weeks after the jaundice has disappeared. Reintroduce the drugs one at a time but avoid Pyrazinamide.

7. LEPROSY

PB Leprosy

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LEPROSY

GENERAL REMARKS

- Leprosy mainly affects the skin and the peripheral nerves. It is a serious disease because it causes nerve damage.
- Leprosy is transmitted by coughing and sneezing. Leprosy is not contracted by touching a leprosy patient. Many people are infected with leprosy bacteria but few get the disease (approximately 1 in 10,000 people annually)

DIAGNOSIS

- Leprosy can cause three types of skin lesions:
 1. hypo-pigmented (light coloured) skin lesions with loss of sensation,
 2. nodules
 3. generalised infiltration of the skin.
- These skin lesions often develop slowly over the years
- The sensation in the skin lesions can be tested with a thin point of cotton wool. A hypo-pigmented skin lesion with loss of sensation is a sure sign of leprosy. The number of skin lesions determines the type of leprosy:
 - less than five lesions: PM (Pauci-bacillary, few bacteria)
 - six or more lesions : MB (Multi-bacillary, many bacteria). Any patient with unexplained nodules or generalised skin infiltration of the skin needs to be seen by a health worker experienced in leprosy diagnosis
 - Leprosy causes inflammation in the nerves. This can result in loss of sensation and muscle power in hands, feet and eyes. Any patient with enlarged nerves and/or unexplained peripheral nerve damage needs to be seen by a health worker experienced in diagnosing leprosy
 - In MB leprosy patients bacteria can be found in a skin smear. To do a skin smear you need to cut the skin with a blade, scrape the fluid and colour it with Ziehl-Neelsen stain

TREATMENT

- Multi-Drug Treatment (MDT) for leprosy comes in blister packs of 28 days (one month). The dose is different for adults and children. Adult PB patients are treated with 600 mg Rifampicin once monthly and 100 mg Dapsone once daily. Adult MB patients are treated with 600 mg Rifampicin and 300 mg Clofazimine once monthly and 100 mg Dapsone and 50 mg Clofazimine once daily
- Leprosy patients become non-infectious within hours after starting treatment. Therefore there is no reason for sending patients to leprosy colonies

- Once a person has been treated for 6 or 12 months all his bacteria have died and relapses are rare. The deformities may however last for life or even increase if the person does not observe daily care. Most of the persons that everyone considers to be a “leprosy patient” (loss of digits, wounds) are actually ex-leprosy patients. They do not need anti-leprosy treatment but do need prevention of further deformities
- Leprosy drugs, registers and training materials are available from the WHO through the Secretariat of Health

PB LEPROSY

Drug	HF	Dose	Frequency	Duration
MDT for PB leprosy – Rifampicin -- Dapsone	C	Blisters for children (5-14 years) and adults	-Monthly supervised dose -Daily dose	6 blisters within 9 months

MB LEPROSY

Drug	HF	Dose	Frequency	Duration
MDT MB leprosy - Rifampicin - Dapsone - Clofazimine	C	Blisters for children (5-14 years) and adults	-Monthly supervised dose - Daily dose	12 blisters within 18 months

NERVE DAMAGE IN LEPROSY

GENERAL REMARKS

- The nerve damage in leprosy is caused by an acute swelling in the nerves. This swelling happens during a reaction, a sudden increase in immunity against the bacteria. This reaction is often provoked by an illness (e.g. by malaria, diarrhoea)

DIAGNOSIS

- Signs of mild reaction are red swollen skin lesions or nodules that appear and disappear in a few days, accompanied by signs of inflammation.
- Signs of a severe reaction are: enlarged **painful** nerves, **increasing** nerve damage, additional skin lesions developing over short period of time, oedema of hands and feet. Nerve damage can be prevented by treating the reactions

TREATMENT

- Leprosy reactions are treated with rest and anti-inflammatory drugs. If the reaction is triggered by another disease then this disease also needs to be treated. A patient on anti-leprosy treatment should not discontinue his drugs during the reaction treatment
- If a mild reaction gets worse during treatment or does not improve within one month: treat as a severe reaction. If a severe reaction gets worse during treatment or does not improve within one month: refer to a specialised leprosy treatment centre. Leprosy patients who become severely ill also need to be transferred to a hospitals or clinics with leprosy expertise

MILD REACTION

Drug	HF	Dose	Frequency	Duration
Acetylsalicylic acid orally	C	600 mg	Three times daily	At least one month
Chloroquine orally	C	150 mg	Three times daily	At least one month

SEVERE REACTION

Start with high doses, taper down slowly with 10 mg per month

Drug	HF	Dose	Frequency	Duration
Prednisolone orally	C	40 mg	Daily	1 month
		30 mg	Daily	1 month
		20 mg	Daily	1 month
		15 mg	Daily	1 month
		10 mg	Daily	1 month
		5 mg	Daily	1 month

Prevention of deformities in leprosy

- Patients with permanent nerve damage lose their protective pain sensation and easily develop wounds during activities of daily life. These wounds can lead to osteomyelitis and loss of digits and limbs. This can be prevented by daily care

Examples of daily care are:

- Avoid injuries
 - do not walk long distances or work continuously, rest at regular intervals
 - bandage tools, use gloves
 - drink hot fluids from a cup with a handle
 - Use protective footwear
 - cover the eyes at night with a sheet
- Be careful with dry skin
 - soak hands and feet for 20 minutes daily and then apply Vaseline or oil
- Check every day for signs of injuries and treat wounds early
 - rest
 - clean
 - bandage
- Strengthen weak muscles with active exercises
- Prevent contractures caused by paralysed muscles through passive exercises

8. SLEEPING SICKNESS

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SLEEPING SICKNESS

INTRODUCTION

Sleeping sickness (SS) or Trypanomiasis is an infectious disease, caused by a parasite known as Trypanosome. It is transmitted to humans by the bite of an infected tsetse fly.

There are two forms of SS:

- *A chronic progressive or “gambiense” type (course over months or years), found in west and central Africa.*
- *A more acute or “rhodesiense” type (course over weeks, months), found in east Africa*

*The form found in Sudan is the **gambiense type**. The disease tends to occur in pockets. The disease has increased over the last twenty years due to the war which disrupted control programs and caused massive population movements.*

Counties affected by the disease are:

- Magwi County (Nimule), extending up to Torit County
- Kajo-Keji County
- Yei County and the new counties of Morobo and Lainya
- Maridi and Mundri Counties
- Yambio, Tambura and Ezo Counties
- Some areas of Juba County reaching Terekeka County

The name sleeping sickness is used because during the later stage of the disease patients appear to be sleeping all the time.

TRANSMISSION CYCLE

SS is transmitted through bites of tsetse flies (glossina) in a fly-human-fly cycle. It is important to realize that humans are the main reservoir of infection for SS. Other modes of infection are vertical transmission from mother to unborn child during pregnancy and transfusion of contaminated blood or needle stick accidents.

CLINICAL SYMPTOMS AND SIGNS

The disease is characterized by 2 stages. Patients show different signs and symptoms in different periods. SS is lethal if untreated.

Stage 1: HAEMO-LYMPHATIC PHASE

Stage 1 occurs weeks or even months after the bites. Prior to phase 1 an inoculation chancre is occasionally seen. The parasite is located in blood and lymphatic tissues.

Symptoms:

- Feverish episodes, headaches, general malaise, joint and muscle pains and pruritus are common
- endocrine problems: sexual dysfunctions, amenorrhea, impotence, infertility, cushing (moonlike) face
- Loss of appetite and weight loss

Possible signs

- The presence of enlarged posterior cervical nodes (Winterbottom's Sign) is quite typical
- hepato-splenomegaly, facial and limbs oedema can be present

In this phase treatment is relatively easy and non-toxic. The disease can be cured without any disabilities left.

Stage 2: MENINGO-ENCEPHALITIC PHASE

Stage 2 starts after months or even years. This stage is irreversible but can last for years even without treatment. The parasite is now located in the cerebrospinal space. In addition to the previous symptoms, neurological and psychiatric symptoms appear.

Possible symptoms

- disruption of the sleeping cycle (mainly daytime somnolence and night time insomnia), apathy
- other behavioural changes (confusion, irritability, melancholy, depression, euphoria, mania, paranoia)
- urinary or faecal incontinence
- occasionally convulsions

Possible signs:

- alteration of reflexes, hypertonia or hypotonia
- unsteadiness, extra-pyramidal syndrome (shuffling gait, bradykinesia)
- hyperaesthesia (increased sensitivity to touch) or paraesthesia (reduced sensitivity to touch)
- movement disorders as tremor

Often the psychiatric symptoms are the only clinical abnormality. This can lead to misdiagnosis and social exclusion of the patient. The family may seek the help of a traditional or spiritual healer first.

Progressive somnolence occurs late and is often accompanied by malnutrition, cachexia and signs of personal neglect. The patient deteriorates progressively, becomes weaker and finally dies from wasting and/or infection. Coma can precede death.

Treatment of the second stage needs highly toxic and expensive drugs and can leave the patient quite disabled.

DIAGNOSIS AND STAGING

There are no clinical signs or symptoms specific for sleeping sickness. Diagnosis depends on laboratory tests. These include:

1. SEROLOGICAL TESTS:

CATT (Card Agglutination Trypanosomiasis Test)

This is an effective and simple tool to use in the field. As they are easy to perform and not very expensive they can be used to screen an at risk population but as the serological test cannot 100 % confirm the presence of the disease, an effort should always be made to confirm it with parasitological tests

2. PARASITOLOGICAL TESTS

In lymph fluid:

- aspiration of a lymph gland and fresh microscopic observation, a simple, cheap and quick method

In blood

- Wet Blood film and Thick film, simple and cheap and can also be used to diagnose filaria or plasmodia, but the sensitivity is low and they are not used systematically in control programs
- Microhaematocrit capillary tube centrifugation technique or Woo technique: effective and simple, but needs some technology
- Quantitative buffy coat: sensitive, quick and simple and plasmodium can also be found, but expensive and needs special equipment.

3. STAGING TESTS:

Cerebro-spinal fluid (CSF) examination.

It is essential for treatment to determine if the parasite has invaded the CNS.

Staging is done by a Lumbar Puncture.

Recommended investigations of the CSF are:

- White blood cell count in CSF
- Microscopic examination of CSF for trypanosomes

Basically, any patient with a high cell count (over 5 cells/micro litres) and / or trypanosomes in the CSF is considered as Stage 2.

TREATMENT

- SS can be treated successfully but treatment is intensive and some of the drugs used are very toxic.

The drugs available in Southern Sudan for the treatment of sleeping sickness are:

Pentamidine: For treatment of stage 1 patients. With the right precautions the drug is quite safe. Pentamidine is given as a once daily dose of 4mg/kg IM (intragluteally) for seven days. The most serious adverse effect of Pentamidine is sudden hypoglycaemia. To avoid this give some glucose previously (sugar, sweets, sugary drinks or even a meal rich in carbohydrates). Do not give on an empty stomach!

Melarsoprol: The most widely available drug for stage 2 patients, very toxic with serious side effects. About 5-10% of all patients treated with this drug die because of treatment. It should be used only by well-trained staff. Melarsoprol is given 2.2mg/kg as a once daily dose IV for ten days, accompanied by Prednisolone orally 1mg / kg / day.

α difluorometilornitine: developed 20 years ago, used for stage 2. Even if the rate of side effects is high, they tend to be less severe and deaths are less common than with Melarsoprol. The drug requires skilled nursing. DFMO is not used in pregnant women or in known HIV positive cases. DFMO is given IV (100mg/kg per dose over two hours diluted in normal saline) four times a day. In children each dose is adjusted to 150mg/kg. Duration of treatment is fourteen days.

Presently, these are the only drugs available and licensed. All are distributed through WHO and not available on the free market.

Patients admitted for treatment of SS need to be treated for any other conditions (malaria, diarrhoea, malnutrition,, etc) and some may have to be fed artificially. Many patients are generally in a bad condition and require considerable nursing care.

FOLLOW UP OF TREATED PATIENTS

Treated cases must be followed up for a period of two years, at 6, 12 and 24 months. Only then cure can be confirmed. CSF examination is mandatory during each visit.

A card is given to the treated patient on discharge with the schedule of follow up. Patients have to bring their cards on follow up visits.

SLEEPING SICKNESS CONTROL

There are 2 elements in a Control Programme:

1. Detection and treatment of cases: This will identify and reduce the human reservoir .There are two ways:

- Passive screening carried out in Sleeping Sickness Centres (see list above):
People come to the fixed lab to be tested
- Active Screening through mobile teams in affected villages. This makes it possible to detect people in early stages of the disease, when treatment is easier and prognosis better

2. Vector control: to reduce the tsetse fly population.

Many SS control programs do NOT include vector control. Vector control is expensive and with limited budgets, many feel the priority is identifying and treating people infected with a fatal condition.

9 EYE CARE

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EYE CARE

PREVENTION OF BLINDNESS

About 80% of blindness is AVOIDABLE. This means that the blindness can be prevented or treated.

Types of blindness that can be prevented:

- | | |
|-------------------------------------|---|
| 1. Trachoma | 5. Harmful Traditional Eye Medicines (HTEM) |
| 2. Onchocerciasis | |
| 3. Vitamin A deficiency in children | 6. Inappropriate treatment of “red eyes” |
| 4. Measles | 7. Conjunctivitis of the new born |

Types of blindness that can be cured:

1. Cataract (50% of all blindness), with surgery
2. Severe refractive errors, with glasses
3. Some Glaucoma with early diagnosis and surgery

TRACHOMA

This is a major problem in dry areas or where people live close to their cattle and where there are many flies.

The “SAFE” strategy has been adopted to target the problem at all levels.

S = Surgery

Adults who have suffered trachoma as children often have scarring of the eyelids which makes the eye lashes turn inwards and scratch the cornea which then becomes opaque (white) and prevents light rays entering the eye properly. Simple surgery can be done to turn out the eyelashes again. Trained eyelid surgeons can do this surgery in simple health centres. **It is urgent to do this surgery if needed before the patient becomes blind**

A = Antibiotic

When many children show active trachoma it is wise to treat the whole community. This can be done using either Azithromycin one oral dose every 6 months or using Tetracycline eye ointment 2 times a day for 6-8 weeks.

F = Face washing

Flies are attracted to dirty faces, particularly if there are tears or secretions from infected eyes. These flies transmit the infection to other children. Flies are NOT attracted to clean faces. Faces should be washed every day. Do not use the same piece of linen to wipe the faces of all the children.

E=Environmental Change

Reduce flies by separating people and animals and encourage use of latrines.
Arrange a good water supply to encourage washing.

ONCHOCERCIASIS

1. Blindness due to onchocerciasis can be prevented by taking an annual dose of Ivermectin (Mectizan)
2. In areas where there is a lot of onchocerciasis (meso or hyper endemic areas) mass distribution is done
3. It is important that the community takes charge of the programme as treatment will be needed for at least 20 years. Treatment with Ivermectin will also improve associated skin disease (especially itching) and reduce epilepsy if it is due to onchocerciasis
4. In areas where there is not much onchocerciasis individual patients can be treated with Ivermectin at PHCCs or County Hospitals

Ivermectin 3mg tablet

Category	Weight (in Kg)	Height (in cm)	Dose tabs of 3 mg
A	< 15 Kg	< 90 cm	0
B	15 to 25	90 - 119	1
C	26 to 44	120 - 140	2
D	45 to 64	141 - 158	3
E	65 Kg plus	159 plus	4

VITAMIN A DISTRIBUTION

1. Vitamin A deficiency is an important cause of mortality and blindness in children, particularly those suffering from diarrhoea and respiratory infections, including measles
2. Vitamin A is found in many foods, maternal milk, red / orange vegetables and fruits (carrots, mangoes, pawpaw) in green leaf vegetables, in meat, particularly liver
3. It is recommended to distribute Vitamin A twice a year to all children under 5 years and to mothers directly after birth. Two main mechanisms exist at present, one using vaccination days but here often only children under 1 year are brought to the clinic, the other mechanism uses a combination of Vitamin A distribution with other programs (like polio days)
4. Primary Health Care Services must make sure that Vitamin A is distributed by one or other mechanism in their area

MEASLES

1. Mortality due to measles is high in Southern Sudan
2. Children can become blind due to corneal scars
3. Vaccination against measles can prevent blindness in children
4. All acute cases of measles should receive two doses of Vitamin A on consecutive days and should be encouraged to eat

HARMFUL TRADITIONAL EYE MEDICINES

1. Some traditional remedies for eye disease are toxic for the cornea and provoke scarring and opacity of the cornea
2. Discourage the use of these medicines by providing health education to the population
3. Encourage all mothers to go for good eye care to a PHCU where Tetracycline Eye Ointment should always be available

BLINDNESS DUE TO BAD TREATMENT OF RED EYES

1. It is rare that patients go blind with conjunctivitis. Normally both eyes are red and usually antibiotic eye ointment is sufficient given 3 or 4 times a day for at least 5 days. If there is no improvement after 5 days REFER
2. Conjunctivitis is uncomfortable but not really painful. All painful red eyes should be REFERRED IMMEDIATELY
3. One red eye is a sign of a potentially serious disease REFER IMMEDIATELY

CONJUNCTIVITIS OF THE NEW BORN

The severe form is usually caused by gonorrhoea from the mother.

Avoid this condition by training midwives to clean the eyes after delivery and apply Tetracycline eye ointment.

If infection occurs

- Eyes may not necessarily be red
- Eyelids may be swollen and on opening there is pus, usually a lot of it

TREAT IMMEDIATELY. There is no time for referral before treatment begins. Wash the eyes out repeatedly with clean water. Apply a large amount of antibiotic eye ointment. Repeat washing and application of the antibiotic

EVERY HOUR - DAY and NIGHT until the discharge stops. Also treat the mother and all her partners for gonorrhoea.

EXAMINATION OF THE EYE

For many conditions this is simple and requires little equipment

1. VISUAL ACUITY

This is as fundamental as taking the pulse or temperature for any other patient and should be measured on first presentation and regularly during follow up visits. Special charts (Snellen Charts) are used with letters of various sizes. Charts with a letter E in different directions are available for illiterate patients. The reading distance of these cards is usually 6 metres. At the end of each line there is a figure usually 6/6, 9, 18, 24, 36, 60. The six represents 6 metres reading distance and the 6, 9, 18, 24, 36 and 60 is the measure of the line read. 6/6 is normal vision.

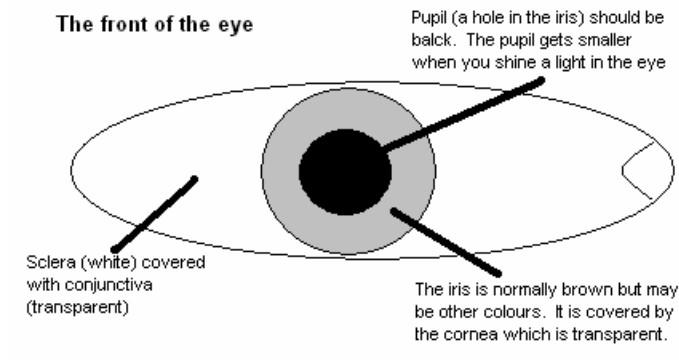
Make the patient read from the top and note the last line that the patient can read correctly. It is important that both eyes are examined independently and that the eye not being tested is properly covered. A vision 6/6 to 6/18 is considered “normal” although for a driving licence you need 6/12. Less than 6/18 down to 3/60 (being able to read the top line at 3 metres only and not at 6 metres) is visual impairment and less than 3/60 is classed as blind.

The thickness of a finger is approximately the same as the “60” line and often counting fingers is used at different distances if the patient cannot see 6/60. If the patient is unable to count fingers he may be able to see a shadow when the hand is moved in front of him. In this case the Acuity is “Hand Movements”. If the patient is unable to see hand movements you need to try a light. If the patient can see the light of a torch in front of him you register Perception of Light (PL). If the patient can tell you which direction the light is coming from you register Perception of Light with Projection (PLP). PLP is important in the evaluation of patients with mature cataracts. If the patient cannot see a light he has Non Perception of Light or NPL. There is nothing one can do medically for a patient with NPL and it is useless to refer him to a specialist. The patient will require the rehabilitation services to help him remain mobile and independent.

2. PIN HOLE

Make a small hole in a piece of card and get the patient to look at the Snellen Chart. If the patient can read one or two lines more looking through a pinhole than when he or she reads without it he (she) has a refractive error and will need glasses.

3. EXAMINATION FROM THE FRONT OF THE EYE



The Conjunctiva and Sclera: Is the conjunctiva transparent and the sclera white behind it? If the conjunctiva is red is the redness all around or is it more localised around the iris (ciliary injection). Are there secretions from the eye; if so are they clear or purulent. The conjunctiva also covers the inside of the eyelids. Turn the eyelids inside out to examine the conjunctiva or check for a foreign body.

The Cornea: Is the cornea smooth, shiny and transparent. When the cornea is not healthy (oedematous) it becomes hazy. When it is scarred it becomes white. If there is ulceration the surface is irregular and if fluorescein stain is used it shows green in the light.

The Pupil: Is the pupil round? Is the pupil regular or do the edges seem to be irregular and stuck down (posterior synechia)? Is it black (normal) or is it white? Does the pupil react to light by getting smaller when you shine the torch in the eye? Do the pupils in both eyes react equally?

The Lens: This is behind the pupil and if it is transparent the pupil looks black. If there is a mature cataract the pupil appears white.

NB: All that is required for a simple eye examination is a Snellen Chart and a torch and a good pair of eyes. An examining loup (magnifying glass) can be useful to see smaller details.

Fluorescein is useful to examine the cornea for lesions, and Tropicamide to dilate the pupil.

DIAGNOSIS AND TREATMENT OF EYE DISEASE

THE RED EYE

Redness is a sign of inflammation often but not always due to infection.

CONJUNCTIVITIS

This is most usually an infection but may be due to allergy or other irritants

Signs and Symptoms:

Examine the eyes

- Are both eyes red?
- Are there secretions (tears)?

If yes, are these tears like water, do they contain pus or are they clear and sticky? The patient probably has conjunctivitis. Most conjunctivitis heals with a few days by using antibiotic eye ointment.

Allergic conjunctivitis is more common in children and is more difficult to treat as it often reoccurs in childhood. NEVER use steroid drops in these cases, inflammation may appear less but infections penetrate deeper in the cornea, particularly viral infections as natural immunity is suppressed.

Treatment:

If there is pus:

- Clean eyes regularly with wet cotton from lateral side inwards
- Apply Tetracycline eye ointment 4 -6 times a day for at least 5 days but continue until the infection has disappeared

If both eye are red but no pus:

- Apply Tetracycline eye ointment 3 times a day for 5 days

If the upper eyelids are red with follicles (trachoma)

- Apply Tetracycline eye ointment 2-3 times a day for **6-8 weeks**

If both eyes are red (either the eyelids or around the cornea) and itchy and There are sticky secretions it is most likely allergic conjunctivitis.

- Apply Tetracycline eye ointment for five days
- If there is no improvement refer the patient to an eye department for further treatment. The patient might need a short course of treatment with steroids, but only after a thorough examination (or Cromoglycate drops to prevent reoccurrence)

OTHER CAUSES OF A RED EYE:

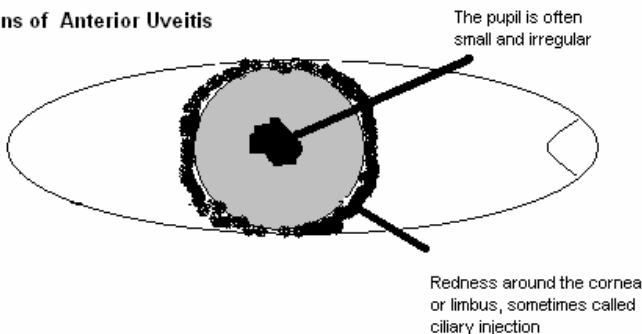
ANTERIOR UVEITIS (IRITIS)

There are several causes including infection and trauma but the cause is usually not determined. The disease seems to be relatively common in Southern Sudan but the cause is not known.

Signs and Symptoms:

- Usually affects one eye
- The eye is red around the cornea
- There is usually some pain although not always severe
- Often light is painful (photophobia)
- Visual acuity is often reduced
- The pupil is small and often irregular if it sticks by adhesions to the lens just behind the iris. These adhesions are called posterior synechia. The intra-ocular pressure may be raised

Signs of Anterior Uveitis



Treatment

1. Dilate the pupil with atropine eye drops. These can be given twice a day for 2-3 days. If the pupil dilates and is regular you can give it less often. If the pupil remains irregular continue with Atropine three times a day for 10 days to try and break the adhesions.
2. Tetracycline eye ointment twice a day for 7 days.
3. Hydrocortisone or Prednisone eye drops should be given every 6 hours for 3 days and if the inflammation begins to clear reduce the drops to three times a day for 3 days, two times a day for another 3 days and then once a day for one week before stopping treatment.

****Extreme care should be used and the cornea must be checked with fluorescein to make sure there is no corneal lesion.**

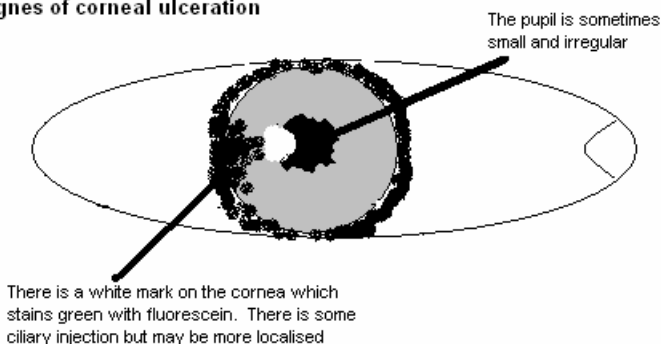
If the intra-ocular pressure is raised Acetazolamide should be used to lower the pressure in a dose of 250mg orally 2-4 times a day depending on the level of the pressure. Acetazolamide should not be used for long periods and in case of persistently high intra-ocular pressure, refer the patient to the hospital.

NB: If the Health Centre is not able to check the cornea or the intra-ocular pressure the patient should be referred to a centre suitably equipped for confirmation of the diagnosis and suitable treatment.

CORNEAL ULCER

There are several causes of corneal ulcer. The most common cause is bacterial or fungal infection of the cornea, often following trauma or inappropriate treatment of conjunctivitis, or following neonatal conjunctivitis with gonorrhoea. Another cause is Vitamin A deficiency especially after an attack of measles.

Signs of corneal ulceration



Signs and Symptoms:

Usually only one eye is affected. The eye is red, localized near the ulcer together with ciliary injection. The eye is painful and the vision acuity is reduced. If a white substance is seen behind the cornea in the bottom of the eye this is pus and called a hypopion. It is a danger sign of severe infection and must be treated urgently.

Treatment:

1. The patient should be referred urgently. BUT treatment should begin immediately with antibiotic eye ointment every hour.
2. Atropine eye drops

If the cause is a fungal infection, often acquired through minor trauma working in the fields the infection is very difficult to treat. Patients must be referred.

CATARACT

1. Cataract is a disease mostly in the elderly over 50 years, sometimes earlier and occasionally children are born with cataracts.
2. The main problem is identification of the patients and persuading them to come for treatment.
3. Community health workers are the best placed to identify patients with reduced vision (using simple VA charts) and refer the patients for further examination. In mature cataracts the pupil (the centre of the eye) looks white. Patients who have had surgery are often the best motivators.
4. Centres for eye surgery will be set up in Southern Sudan. In the meantime publicity should be given to visiting eye teams so that patients know where to go and when.

Signs and Symptoms:

- There is a gradual reduction of the vision without pain. Sometimes the patient can only count fingers at 2 or 3 metres. There may be almost complete loss of vision however it is important to test for perception of light, and not only just if the patient can see the light of a torch in front of him but also if he can identify which direction the light is coming from, left or right side, above and below and all these directions must be tested with a torch as they are important when deciding on surgical treatment.
- The pupil should constrict well when you shine a light in the eye. Test both eyes for this pupillary reflex. If there is not a good pupillary reflex the patient will probably not benefit from surgery.
- Examination of the lens. If the cataract is mature the lens will be white and the pupil will look white instead of the usual black. Early cataracts are more difficult to see without an ophthalmoscope or a slit lamp. Make sure the white opacity is behind the pupil (A corneal scar is in front of the pupil).

Treatment:

The only treatment of mature cataract is by surgery. Older techniques used to remove the lens of the eye and the patient had to wear heavy spectacles (around +10) to make up for not having a lens. Modern techniques replace the natural lens with a small artificial lens inside the eye.

All patients diagnosed with cataract should be referred to a surgical centre. This is not urgent. Children with cataracts need different surgical techniques and should be referred to more specialised centres. Children should be operated without delay. After 8 years of age the vision will not develop even if surgery is done perfectly.

GLAUCOMA, OPTIC ATROPHY AND CHORIO-RETINAL DISEASE

GLAUCOMA

1. Glaucoma is a disease causing progressive, painless visual loss starting in the periphery of vision. Patients often do not notice the disease until it is far advanced. It affects both eyes but usually develops in one eye before the other.
2. Any visual loss particularly in one eye should be referred as soon as possible for diagnosis and treatment.
3. Treatment (normally surgical) is available but this only slows down or stops the evolution of the disease towards blindness and is not always successful, and ONCE YOU ARE ALREADY BLIND WITH GLAUCOMA THERE IS NO TREATMENT so early treatment is indicated.
4. Village health workers should check visual acuities of people in their village and anyone with a poor visual acuity particularly in one eye and with a black pupil should be referred urgently.

Signs and Symptoms

The patients complain of gradual loss of vision which is usually painless, it may remain partial or become total. The visual acuity is reduced and is often worse in one eye. The pupil reflexes are often slow and different in the two eyes.

Diagnosis

Fundus examination with an ophthalmoscope will indicate the diagnosis. Intraocular pressures (IOP) should also be measured as this is an important sign in glaucoma.

Treatment

If the IOP is more than 21 and the patient still has some vision refer urgently. If glaucoma is controlled vision can be conserved but once the patient is blind there is nothing that can be done.

Also refer other patients for diagnosis. Many causes of retinal disease and optic atrophy are difficult to treat and changes may be permanent but specialist advice should be offered where possible.

REFRACTIVE ERRORS

1. There are two main groups of patients, children and young adolescents at school who develop myopia (difficulty to see far) and adults who develop presbyopia or difficulty to see near objects and to read after around 40 years of age.
2. School screening (by teaching staff using Visual Acuity charts) is the best way to identify children needing glasses. This is a pointless exercise if simple low cost glasses are not available. Children who can not read the 6/18 line do need glasses.
3. Adults with difficulty to read need simple presbyopic glasses ranging for around +1.00 at 40 years of age to + 3.00 at 60 years of age. Presbyopia does not change after 60 years of age. Simple low cost glasses should be made available at PHCC level and simple testing can be carried out by a nurse using normal reading material.

MYOPIA

Signs and Symptoms

This affects children mostly in the top end of primary school and in secondary school. The children have to sit at the front of the class to see the blackboard and when writing in their books have their heads very close to the paper. Visual acuity (VA) is reduced and is important if it is less than 6/12

Treatment

The patient should be tested with negative spherical lenses.

Each eye should be tested separately and the visual acuity checked. Starting with – 1.00 Dioptre Spherical Lens visual acuity should be checked. If there is some improvement, but is not sufficient, change the strength of lenses by -0.5 Dioptres, one at a time. Try to correct to 6/6 if possible.

PRESBYOPIA

Signs and Symptoms

The patient, who should be at least over 35 years old, has difficulty with close vision, e.g. reading a book or threading a needle. Distance VA should be normal 6/5 to 6/12. The rest of the eye examination should also be normal.

Treatment

Give the patient a book to read which should be held at around 35 cm from the head. Begin with +1.00 Dioptre spherical lens and see if there is any improvement. Add 0.5 Dioptres at a time until the patient sees the book clearly. NB Do not let the patient bring the book too close to the head or he will choose

glasses that are too strong and will complain after a few days and ask for new ones. If distance vision is normal and there is no other disease glasses required should be more or less as below:-

Age 40 years	+1.00
Age 45 years	+1.50
Age 50 years	+2.00
Age 55 years	+2.50
60 years and above	+3.00

TRAUMA TO THE EYE

FOREIGN BODIES

Small foreign bodies (FB) stick on the conjunctiva, cornea or under the upper lid. They scratch and the patient feels as if there is “grit in the eye.”

Treatment:

- FBs should be removed with a small cotton wool bud
- FBs partially imbedded in the cornea may need to be removed with a needle. Instil local anaesthetic and put the point of the needle beside the FB. Insert it just under the FB and lift the FB away from the cornea (if you are not trained or comfortable with this procedure refer) Beware not to push the FB further in and not penetrate the cornea with the needle. Some people use a circle of nylon thread held in a pair of forceps to stroke across the surface of the cornea
- Put in Tetracycline Eye Ointment and if the patient feels pain on blinking the eyes put on a firm dressing and bandage.

CHEMICAL BURNS

The most common are acid from car batteries and cement dust. Cement dust is very dangerous as the effects are not always seen immediately.

Treatment:

- First aid is to wash (irrigate) the eye as soon as possible and continue for at least 30 minutes. Use clean water if available but if not use any water available and put drops continuously onto the eye so that the water runs down the face. DO NOT STOP. The chemical must be diluted as soon as possible and this includes chemicals that have already started penetrating the cornea which must be “sucked back out” with the irrigation

- Turn the upper eye lid and make sure no cement dust has remained in the upper fornix as it will stick to the conjunctiva and continue to contaminate the eye. You may have to remove this with a cotton wool bud

BLUNT TRAUMA

This is caused by a large object hitting the eye. There may be bleeding under the conjunctiva, or more importantly bleeding inside the eye (hyphema).

Treatment:

- Patients should be told to rest
- If there is blood in the eye they should be referred for specialist advice. A hyphema may cause an acute glaucoma and the eye may become painful. If the IOP is raised, treat with Acetazolamide 250 mg 4 times a day for 5 days whilst referring the patient to a specialist
- The bones around the eye protect the eye however if there was a lot of force the eye may be pushed back and cause a fracture of these bones. Check that the eye movements are normal after blunt trauma. If they are abnormal and the patient has double vision when looking in certain directions refer for specialist advice.

PENETRATING INJURIES

These are obviously dangerous for the vision but more important may become infected and there is a small risk of tetanus.

1. Cover the eye with a shield to prevent dust getting into the eye. DO NOT PUT PRESSURE ON THE EYE.
2. Begin systemic antibiotic treatment e.g. Cotrimoxazole 2 tabs twice daily
3. Give an anti-Tetanus injection if available
4. Transfer the patient without delay to an eye surgical centre

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KALA AZAR

10.1 INTRODUCTION

The leishmania parasite causes

- primary kala azar
- relapse of kala azar
- post kala azar dermal leishmaniasis or PKDL

Primary kala azar causes fever, wasting and death. A kala azar relapse is the same disease but it happens after the patient has been treated and it is not very common. PKDL is a skin disease that occurs after treatment for kala azar and is quite common.

The parasite is transmitted by a sandfly. It can occur in small numbers of people or in epidemics that can kill a whole village. But, it is a treatable disease, so early diagnosis is very important. The treatment is long, painful, toxic and expensive. Because of this it is important to diagnose both clinically and with laboratory support. Kala azar is endemic in Gederaf, Blue Nile, Sennar Upper Nile states and an area around Kapoeta transmitted by *P. Martini*.

TRANSMISSION

- The sandfly usually bites in the evening and through the night
- The sandfly bites are high in number between March and June (the timing is uncertain in Kapoeta area)
- The sandfly in Sudan lives in areas with acacia and balanites forests where there is cracked black cotton soil. It also lives in the Kapoeta area
- After the sandfly bites an infected person the parasite takes one week to develop. So it is safe to sleep under one net with an infected person

PREVENTION

- Mosquito nets offer protection. They must be fine mesh (the sandfly is smaller than a mosquito) or a treated net or a cloth net
- When you are not under the net wear clothing that covers your body. Women should keep their babies covered by their cloth under the net
- Neem oil on your skin or other insect repellents will prevent sandfly bites for a few hours
- There is no vaccine

10.2 PRIMARY KALA AZAR

10.2.1 DIAGNOSIS

Clinical Diagnosis, general remarks:

The clinical diagnosis of kala azar depends on a history of fever for 2 weeks or more and a big spleen. There are exceptions. In endemic areas febrile malnourished patients without other diagnoses are likely to have kala azar.

History:

- What is the problem and for how long
- What medicines have they taken
- Have they been treated for malaria
- Have they ever been treated for kala azar before
- Also ask questions about other infections common for kala azar patients: do they have a cough, wounds, wounds in the mouth, bleeding, vomiting or diarrhoea

Clinical features of kala azar:

- Fever for more than 2 weeks
- Weight loss and Pallor
- At times, abdominal pain, nose bleeding, cough or diarrhoea
- Other infectious diseases are common
- Exclusion of malaria or treatment for malaria

Examination for suspected kala azar:

- Documented fever – you may need to take the temperature in the afternoon as there may be no fever in the morning
- Enlarged spleen (85% of kala azar patient have a large spleen) or symmetric lymphadenopathy
- Wasting – check weight and height if possible
- Anaemia
- Often some hepatomegaly
- History and exam for other diseases

PHCU:

If you have a patient with fever for more than 2 weeks and splenomegaly or malnutrition consider kala azar. You will want to refer this patient to the nearest kala azar treatment centre / PHCC.

- Make sure that patient has been treated for malaria or has tested negative for malaria. Unless the patient is severely ill, treat malaria and see if the patient becomes afebrile before the patient is sent home
- Give treatment for all other illnesses the patient has. They can take the medicines on the way to the PHCC
- If the patient is severely malnourished, give vitamin A
- Never give Acetylsalicylic acid (Aspirin) as it increases bleeding and kala azar patients can bleed from the nose

If several patients with kala azar present at the clinic / health facility within a month notify the county health authorities and the nearest kala azar treatment centre. The health staff in the facility will need help if there is an outbreak in the area. Find out as much as possible where most sick patients are coming from and if there are any deaths.

HOSPITAL / PHCC WITH KALA AZAR TREATMENT

Diagnosis

If there is a patient with a fever for more than 2 weeks and splenomegaly or wasting that is not malaria then the patient is considered to have a clinical suspicion of kala azar. This patient needs a laboratory test to confirm the diagnosis.

General measures:

- Treat all inter-current illnesses
- Give vitamin A if they are malnourished
- Give Ferrous and Folic acid or Folic acid alone while awaiting the test result

Laboratory testing

The standard testing done in South Sudan is a DAT test. This is a blood test that tests for antibodies. People who have previously been treated for kala azar may be positive for several years. Patients with primary kala azar will be positive.

HOW TO DO A DAT TEST:

- Register the patient and give a number. Write enough information about his/her family and address to trace him/her if they disappear. Also find out which Payam they are from in case if the outbreak needs to be evaluated.
- Clean the finger and do a finger stick on the end of the finger
- Collect blood on Whattmann filter paper No.3 (**only Whattmann No.3 filter paper works**)
- Collect enough blood to fill a circle of about 1 to 1.5 cm

- Turn the filter paper over to see if the blood soaked all the way through
- Let the filter paper dry but not in the sun
- Store in a plastic bag or a paper envelop. Do not store in a wooden box as some paint or finish of the boxes destroys the sample
- This sample can be stored at room temperature for up to 2 weeks or for a long time in a cold chain
- Tell the patient when to return for results. If the patient with a positive result does not return try to find him/her

HOW TO CALCULATE THE DOSE OF Sodium StiboGluconate (SSG)

SSG is 100 mg / ml so it is easy to calculate:

Dose in cc = (weight in kg x 20 mg/kg) / 100 mg/ml

Or, ml = wt in kg x 0.2

EXAMPLES:

If your patient weighs 40 kg

40 x 0.2 = 8 - so give 8 ml

If your patient weighs 32 kg

32 x 0.2 = 6.4 - so give 6.4 ml

If your patient weighs 8 kg

8 x 0.2 = 1.6 - but give 2 ml (the lowest dose)

LABORATORY TESTING – ALL THE FIELD POSSIBILITIES

1. **IMMUNOLOGIC TESTS** – DAT is the standard test
 - DAT test – widely used in southern Sudan – 95% sensitive
 - rK 39 antigen based dipstick test – 80% sensitive
2. **PARASITOLOGY** – not available in most treatment centres
 - splenic aspirate – 95% sensitive
 - bone marrow aspirate – 80% sensitive and painful
 - lymph node aspirate – 60% sensitive

10.2.2 TREATMENT OF PRIMARY KALA AZAR

SSG Injections 20 mg / kg / day IM for 30 days

SSG is made as 100 mg/ml

- There is no upper limit, but doses above 10ml should be given in 2 separate injections
- The smallest dose is 2ml – all patients weighing 6-10 kg should receive 2ml
- If a child weighs 5 kg or less, he/she is usually severely ill. In this case administer only 1ml daily and monitor closely
- Weigh weekly and recalculate the dosage of SSG
- In case of severe vomiting the SSG should be stopped for 2 to 5 days until the vomiting stops
- After 5 injections if a patient is still critically ill consider stopping the SSG for one week
- Patients with severe ascites may need a lower dose. If the patient has severe ascites:
 - Subtract 5 kg from the weight of an adult
 - Subtract 2 kg from the weight of a patient weighing between 24-40 kg
 - Subtract 1 kg from the weight of a patient weighing between 10-23 kg
 - Then calculate the dose of SSG

10.2.3 ADDITIONAL TREATMENT:

- Because kala azar depresses the immune system, patients are at increased risk for other infections. The severity of such infections in kala azar patients may also be greater. All concurrent illnesses should be treated immediately and aggressively.
- Many kala azar patients are severely malnourished. Because of this and their immune depression, these guidelines include routine treatments similar to those given in therapeutic feeding centres.
- Kala azar patients can die during treatment. Those at most risk are the very young (< 3 years), the old, the severely malnourished, the severely anaemic, those with prolonged disease (more than 2 month history), and those with vomiting. These patients require special care and attention!

Admission and routine treatments

- Malaria (if not treated in the last 2 weeks)
- Vitamin A
- Metronidazole or Tinidazole for 3 to 5 days
- Amoxicillin for 5 days (for all children under 5 and all severely malnourished patients)

- Administer Ferrous and Folic acid daily for one month – if severely malnourished start with one week of Folic acid alone and switch to Ferrous plus Folic acid (or have the patient treated in a feeding centre)
- Check the need for vaccination
- Provide supplementary or therapeutic feeding if possible

Treatment of specific concurrent illness common with kala azar:

- Pneumonia – Treat with Amoxicillin
 - if severe then administer Chloramphenicol or Ceftriaxone
 - if pneumonia remains persistent during treatment consider TB
- Significant diarrhoea, defined as any ONE of the following:
 - ≥ 4 x diarrhoea per 24 hours
 - bloody diarrhoea
 - diarrhoea with fever
 - and diarrhoea in a severely malnourished patient

TREATMENT FOR:

- Significant Diarrhoea:
 - Administer ORS
 - Administer Ciprofloxacin for 3 days PLUS Metronidazole or Tinidazole
 - check for vomiting
- Vomiting
 - any anti-emetic such as Promethazine orally or injectable
 - ORS or IV hydration
- Gingivitis
 - Amoxicillin or Penicillin
 - mouth hygiene
- Bleeding nose
 - intra nasal Petroleum Jelly /nasal pack with Petroleum Jelly
- Pregnancy – Follow normal ANC procedures

Note that some patients get herpes zoster at the end of or after kala azar treatment. This is not related to HIV disease.

10.2.4 CLINICAL COURSE DURING TREATMENT:

The fever comes down to normal within 5 to 10 days. Weight gain is not common during treatment with SSG, and the spleen gets smaller but may not go back to normal. At the time of discharge, the spleen may still be palpable. An enlarged liver at discharge is unusual (Also consider schistosomiasis). Anaemia is commonly still present.

10.3 RELAPSE OF KALA AZAR

Relapse of kala azar typically occurs within a year of primary kala azar treatment, most commonly before 6 months. The clinical disease is the same as primary kala azar but the DAT can not help confirm the diagnosis. The DAT will remain positive for some time even without disease.

10.3.1 DIAGNOSIS OF RELAPSE

PHCU LEVEL

If a patient has been previously treated for kala azar and returns with a clinical picture of kala azar this may be a relapse. Please follow the guidelines for primary kala azar. Treat for other illnesses and refer.

HOSPITAL / PHCC WITH KALA AZAR TREATMENT

DIAGNOSIS

If the patient is clinically diagnosed with kala azar, he/she must be asked if the person has been treated before. Ask about the previous treatment:

Was it a known treatment centre? If not:

- Did they have 15 days of injections or more?
- Was the injection a clear fluid?
- Was the amount of each injection reasonable for the patient's size?

If a patient has had a fever for more than 2 weeks and has a palpable spleen check and treat them for malaria. Consider typhoid. If they still have a fever after treatment for other diseases, they need a spleen or lymph node aspirate. A DAT test is not helpful as it can stay positive for some years after treatment.

If parasitology is unavailable, do a lymph node aspirate make this a thin smear, fix with methanol, and send it to a central lab that is experienced in diagnosis of kala azar.

Sometimes a clinical diagnosis is all that is possible and it is advisable to use this judgement rather than not treating the patient at all. Remember that in Sudan relapse is uncommon at < 5% of patients.

10.3.2 TREATMENT OF RELAPSE OF KALA AZAR

SSG 20 mg/kg/day for 60 days (see treatment of primary kala azar for SSG usage)

OR

SSG 20 mg/kg/day for 30 to 60 days plus Paromomycin IM 12 mg/kg/day for 17 days

Other drugs not usually available include Amphotericin B (1 mg/kg for 15 doses in 30 days) or AmBIsome.

PAROMOMYCIN

This is an aminoglycoside drug like Gentamicin so it can have toxicity for the kidney function or hearing

- These drugs must be administered using 1ml and 2ml syringes
- Paromomycin is not yet registered, so it is used only for relapse or PKDL. But studies are complete and successful. It has been used without complication in Sudan
- There is no minimum or maximum dose
- Use with caution for
 - Patients who may be dehydrated
 - Pregnant women – it may affect hearing of the new-born
 - Patients over 60 years should not be treated with Paromomycin
- Paromomycin may NOT be given intravenously

10.3.3 EVALUATION OF CURE OF RELAPSE

HOW TO CALCULATE THE DOSE OF PAROMOMYCIN

Paromomycin is 500 mg/ml so it is difficult to calculate.

Dose of paromomycin in ml = (weight in kg × 12) divided by 500

EXAMPLES:

If your patient is 8 kg:

$$(8 \times 12) / 500 = 96 / 500 = 0.19 \text{ so give } 0.19\text{ml}$$

If your patient is 15 kg:

$$(15 \times 12) / 500 = 180 / 500 = 0.36 \text{ so give } 0.36\text{ml}$$

If your patient is 45 kg

$$(45 \times 12) / 500 = 540 / 500 = 1.08 \text{ so give } 1.08\text{ml}$$

Cure of relapse can be evaluated with weekly aspirates as test of cure (TOC). Commonly patients are considered cured after 2 negative aspirates. If no parasitology is available, follow the above guideline.

10.4 PKDL

10.4.1 CLINICAL PKDL

Post kala azar dermal leishmaniasis is called PKDL.

- *This is a rash that starts on the face. It sometimes spreads to the whole body but it always starts on the face*
- *This rash usually starts within 6 months of having kala azar. Sometimes it starts at the end of kala azar treatment. Rarely it may start if the person was not previously treated for kala azar*
- *PKDL usually heals by itself. Sometimes it comes and goes for years. Sometimes it gets worse and worse. Sometimes it affects the mucous membranes*
- *PKDL sometime occurs at the same time as a relapse of kala azar. This is deadly unless treated.*

PHCU level

The diagnosis of PKDL is easier if you can study pictures. Note that people can die with severe PKDL and that PKDL itself may be a reservoir for kala azar infection. Refer patients that may require treatment. Patients must be advised that mild disease may clear up on its own however they should come back in case if symptoms get worse.

WHEN TO TREAT PKDL

- *The rash shows blackening especially around the nose*
- *The rash is dense – the skin is almost covered with bumps that are almost touching*
- *The rash includes mucous membranes – especially the nose, eyes or mouth*
- *The rash is peeling or scaling*
- *The patient with this rash is also ill with fever (after treatment for possible concurrent illnesses) and has a big spleen*

The patient who develops PKDL during kala azar treatment. This patient should be continued on treatment until the PKDL is cured

HOSPITAL / PHCC WITH KALA AZAR TREATMENT

DIAGNOSIS OF PKDL

See the above guidelines for determining who should be treated for PKDL. If there is not enough SSG, treat only those with mucosal involvement and those who also have a relapse. Note that patients can get PKDL a second time.

10.4.2 TREATMENT OF PKDL

SSG 20 mg/kg/day for 30 - 120 days OR SSG 20 mg/kg/day for 30 to 60 days plus Paromomycin 12 mg/kg/day for 17 days

The use and precautions for treatment with SSG and Paromomycin are listed in the previous sections on treatment of kala azar and relapse of kala azar respectively.

10.4.3 EVALUATION OF CURE OF PKDL

End of treatment of PKDL is when the rash is no longer palpable. Feel the rash with using the fingers. If the skin is smooth treatment can be stopped even if the rash is still visible. All patients must receive at least 30 days of SSG.

10.5 DIFFERENTIAL DIAGNOSIS:

Malaria / malarial cachexia remain the most important differential for patients with fever, splenomegaly and wasting

	Kala Azar	Typhoid	Brucella	Schistoso miasis – liver	Tropical spleno megaly
FEVER	YES > 2 weeks Mostly in afternoon & evenings It can last months	YES – a high fever to 40°. It is constantly high. It lasts 3 – 4 weeks	YES – intermitte nt up to 2 years. Some days no fever	NO - unless there is another infection	NO – unless there is another infection
WASTING	YES, severe	Maybe – a little	Yes, slowly	Rarely (except end stage)	No

BIG SPLEEN	YES – most have a big spleen	YES, not all patients have a big spleen, and the spleen is only a bit enlarged	Only 1/3 of patients have a big spleen	Yes in the late stages	YES – usually a huge spleen, growing for years, usually firm
BIG LIVER	Some, but usually not huge	Not often	< 1/3 of patients have a big liver	YES, this is the classic sign	NO
SPECIAL CLINICAL	Very sick	Very sick, very high fever – and can be talking crazy	Some have swollen painful joint, big lymph nodes	Always a big liver, non-tender no jaundice	Always a big spleen – usually for years
Will a DAT be needed	YES	Yes, if there has been 2 weeks of fever	Maybe – is there weight loss? A big spleen?	No – there is no fever	No – there is no fever

****For all chronic fevers consider TB or HIV****

11. HIV- INFECTION

Advice for HIV positive persons

The role of the health worker in treatment of HIV positive patients

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HIV- INFECTION

HIV is a chronic and progressive illness, and HIV-affected people need different types of healthcare and social support at different times. A wide spectrum of HIV-related services are possible: psychological or social support such as counselling and support groups, preventive medical care and treatment, treatment of opportunistic infections (OIs), anti-retroviral therapy (ART, often just called ART) and home-based care. Much support can be offered even if ART is not yet available.

Each community in South Sudan should strive to offer a range of services to HIV-infected persons and their families. Care and compassion is important from a humanitarian point of view, but can help reduce stigma and foster the openness about HIV that will be needed to effectively control the epidemic

ADVICE FOR HIV POSITIVE PERSONS

The health of HIV positive people can be greatly influenced by their lifestyle and by their attitude.

Lifestyle:

- Eat a good and balanced diet
- Maintain good household hygiene. The household should have a latrine and a safe water source
- Take enough rest
- Positive patients who are sexually active should always practice safe sex
- Seek early treatment when illness occurs

Attitude:

- Take control over their life. Actively make decisions about whether to have children and think about plans for their partner(s) and children
- Should be able to set achievable goals for your life
- Join a support group in order to be able to talk with people with the same problem

THE ROLE OF THE HEALTH WORKER IN TREATMENT OF HIV POSITIVE PATIENTS

- Simple interventions can help keep HIV-infected patients healthy, including preventive therapies, mosquito nets, and promotion of better hygiene
- Be tolerant and open, counsel and encourage. Never be judgmental or stigmatizing

- Keep the HIV status of patients confidential
- Patients need a lot of counselling about sex in order to protect their partners and themselves. If patients are sexually active, they should always practice safe sex (even if both partners are HIV positive), inform partners of HIV infection and always use condoms. Recommend testing of sexual partners and strongly urge patients to disclose their HIV-positive status to their partners. Couples counselling can be an effective way to promote partner testing and disclosure

NB: An important number of people with HIV have sexual partners who have not YET been infected. Healthcare workers have a responsibility to try to identify “discordant” couples in order to prevent infection of the partner at risk. In addition, even if both partners are HIV-positive, there is evidence that condoms can keep both partners healthier.

- Be aware of HIV-related diseases and treat patients early for opportunistic Infections (OIs) and other HIV-related conditions. HIV-infected patients are at greater risk of tuberculosis, bacterial pneumonia, diarrhoea, herpes zoster, yeast infections and numerous other problems
- Encourage the establishment of an HIV support group
- Think together with the community about the future of AIDS orphans and AIDS widows
- Discuss the wish for children with the couple and inform them about the risks, contraception and the possibility of Nevirapine preventive measure

11.1. BASIC PREVENTIVE CARE

There are a number of simple interventions available that can keep persons with HIV healthier and prolong their lives. The care can be offered to all infected persons, regardless of the stage of illness or before they are sick. The best known of these interventions is “Cotrimoxazole Preventive Therapy” (CPT).

A. COTRIMOXAZOLE PREVENTIVE THERAPY (CPT)

People with HIV should take Trimethoprim-Sulfamethoxazole (Cotrimoxazole) once a day for life to decrease illness and prolong life. In Africa, CPT reduces frequency and severity of malaria, diarrhoea, and probably pneumonia in people with HIV.

Recommendations

- Give Cotrimoxazole prophylaxis to all persons infected with HIV, beginning at the time of diagnosis
- Dose for prevention is half that used in typical treatment regimens: Prescribe Cotrimoxazole, two single-strength tablets (or one double-strength tablet), once daily continuously for life
- Counsel patients about the importance of taking the medication regularly
- Cotrimoxazole is quite safe in pregnancy, despite beliefs that it should be avoided during the third trimester
- Skin rashes may occur as a side effect but rarely

B. INSECTICIDE – TREATED BED NETS

As outlined earlier malaria is more severe and more frequent in both children and adults who are infected with HIV.

Recommendation:

- Give long-lasting insecticide-treated bednets (LLITNs) to all persons infected with HIV in South Sudan, with appropriate education on their use.

C. TUBERCULOSIS INTERVENTIONS FOR HIV-INFECTED PERSONS

TB is a leading cause of severe morbidity and mortality among persons with HIV/AIDS. Active TB accelerates HIV progression and immunosuppression while HIV promotes the development of active TB.

Case finding and treatment

Recommendations:

- Screen HIV-infected persons for active TB using a minimum and simple set of questions to identify suspect TB cases (e.g., prolonged cough, weight loss, night sweats).
- Do this regularly from the day of diagnosis
- If there is any suspicion refer the patient to a TB centre

TB preventive treatment

Recommendations:

- Consider INH (Isoniazid) preventive therapy (IPT) for people living with HIV/AIDS when active tuberculosis can be reasonably excluded
- Patients suspected of having active TB must be referred immediately for diagnosis and treatment and not be given INH
- Give INH 300 mg daily for 6 months to healthy close contacts
- Pyridoxine daily can prevent or treat peripheral neuropathy

D. VITAMINS

Extra vitamins are useful either in food or as separate tablets.

Recommendations:

- provide daily multivitamins to HIV-positive adults, especially pregnant and lactating women
- Vitamin A supplementation for HIV-positive children, according to national protocols for all children is also recommended

E. SAFE DRINKING WATER AND PERSONAL HYGIENE INTERVENTIONS

Diarrhoea is a major problem in persons with advanced HIV infection, in adults as well as children

Recommendations:

- Teach patients with HIV and their family members the importance of washing hands with soap and other simple hygiene measures
- HIV-affected families (like all families) should have latrines

F. NUTRITION COUNSELLING AND SUPPORT

Persons with HIV have increased energy demands. Combined with the lack of adequate nutrition contributes to the wasting syndrome, one of the most common AIDS defining conditions.

Recommendations:

- Advise HIV-infected persons about nutrition
- Counselling is not enough when there is not enough food
- Encourage the development of programs that can help provide better nutrition for HIV-infected people and their families. Like backyard gardens or livestock raising, income-generation or direct food supplementation
- Therapeutic feeding for severely malnourished HIV-positive adults and children should be a part of palliative care programs

G. HIV COUNSELLING AND TESTING

Counselling and testing has several goals. Knowing individual HIV status can be important for prevention. It allows the people to adapt their behaviour accordingly to prevent new infections (in themselves if they are negative and in others if they test positive). Testing is also necessary in order to find out who needs care and treatment!

Recommendations

- Health care workers should actively promote HIV counselling and testing
- HIV testing should be done according to national guidelines and standards and never without consent of the patient
- HIV testing should be routinely offered in certain settings including tuberculosis programs, antenatal care programs that offer prevention of mother to child transmission services, and patients with sexually transmitted infections
- For persons infected with HIV, it is important to encourage testing of partners and family members

11.2. TREATMENT OF OPPORTUNISTIC INFECTIONS (OIs) IN PERSONS LIVING WITH HIV/AIDS

The most common cause of sickness and death in HIV is due to occurrence of OIs; most OI's are readily treatable. CPT is a greatly underused, cheap, simple and highly effective preventive intervention.

A. TUBERCULOSIS

Tuberculosis is the most common OI. See information above on screening people with HIV for TB. Persons known or suspected to have TB should be treated according to national guidelines.

B. BACTERIAL PNEUMONIA

Bacterial pneumonia is more common in people with HIV. Causes, signs and symptoms, and treatment are similar in persons with and without HIV infection.

Treatment:

- Amoxicillin Or Erythromycin

C. INFECTIVE DIARRHOEA

- Acute diarrhoea
- Chronic / recurrent diarrhoea

Management

- Re-hydration preferably oral, only in severe cases administer IV fluids
- If possible, treat according to stool analysis

- o If acute diarrhoea with fever and / or blood, administer Ciprofloxacin for 3 days
- o If lab facilities are not available:
- o Trial of Cotrimoxazole – 2 tabs BD 5 days
- o If there is no improvement try Metronidazole for 7 days
- o If there is still no improvement, then try Albendazole
- o If there is no improvement then do symptomatic management, Eg: Loperamide, dietary advice etc.

D. CANDIDIASIS (THRUSH)

- Vaginal: Vaginal *Candida* infections are common in HIV positive women but can also occur in healthy women (esp. in pregnancy or in a patient with diabetes)
- Oropharyngeal: common in children, in adults mainly in the later stages of HIV/AIDS
- Oesophageal candida infection occurs late in the disease and is an important cause of morbidity and mortality

Clinical signs:

- Painful swallowing
- Results in inadequate oral intake
- Dehydration, malnutrition and death

Treatment

Vaginal candidiasis

- Clotrimazole Vaginal Pessaries: single dose

Oropharyngeal candidiasis

- Gentian violet: apply 3-4 times a day in the mouth
- Or: Nystatin lozenges to be crushed in the mouth 4 times daily

Oesophageal candidiasis

Oesophageal candidiasis requires referral to hospital, where appropriate medication may be available

E. HERPES ZOSTER

Herpes zoster is caused by a latent Varicella zoster infection in the partially immune host, the elderly or people with HIV/AIDS. For diagnosis and treatment see chapter on dermatology.

F. DERMATOSES

Causes:

- Scabies: very common, but often under diagnosed. In HIV positive patients it may not have the typical appearance
- “Papular Pruritic Eruption”, characterized by severely itchy papules
- Fungal skin infections
- Seborrhoeic dermatitis

Management:

See chapter on dermatology

G. PNEUMOCYSTIS PNEUMONIA

Pneumonia caused by *Pneumocystis* spp. differs from bacterial pneumonia in its presentation and treatment. It usually does not occur in people who do not have HIV.

Clinical presentation

- Cough
 - Usually dry
 - Days to weeks
- Shortness of breath
 - Can be acute (days) or insidious (weeks)
 - Can be extreme
- Fever
- Cyanosis

Management

If *Pneumocystis* is suspected, refer to the hospital for evaluation.

- The recommended therapy is High dose Cotrimoxazole:
 - 120mg/kg per day in 3-4 doses
 - Eg: Dose for 60kg man is 7200mg/day
 - 7200mg / 480mg = 15 tablets daily, therefore dose of approx 4 tabs QDS(four times daily)
 - If severe respiratory distress or cyanosis present, add Prednisolone
- Supportive therapy if necessary
 - Oxygen therapy
 - IV fluids

NB: Long term secondary prophylaxis needed (CPT)

H. CRYPTOCOCCAL MENINGITIS

Clinical presentation

- Headache, often slow onset over weeks
- Fever, often only in later stages
- Neck stiffness, often absent in early disease
- Confusion
- Convulsions and coma in more advanced illness

Diagnosis is difficult in Sudan. Lumbar puncture is needed for special tests. Refer suspect cases to specialized hospitals.

I. TOXOPLASMOSIS

Clinical presentation

- Focal neurological deficits – consistent with a space occupying lesion
 - Eg: Progressive paralysis, blindness, cerebral signs, incontinence etc.
 - Can be acute or progressive
- Headache occurs in about 70% of the cases, at times severe, usually no neck stiffness
- Fever only present in about 50% on first presentation
- Confusion or personality change
- Convulsions and coma in advanced disease

Diagnosis of Toxoplasmosis

- Diagnosis of toxoplasmosis is difficult with available technology in Southern Sudan
- Refer suspected cases to higher level

11.3. PAIN MANAGEMENT

An estimated 80% of persons with advanced HIV/AIDS experience moderate to severe pain. Pain may have various origins, including the virus itself (e.g., peripheral neuropathies and other forms of neuropathic pain), secondary infections and their treatments or due to unrelated current infections, but also fear and anxiety can exacerbate the pain.

Lack of adequate pain treatment has serious consequences for the HIV-infected person as it can cause lack of sleep, impossibility to function fully, and depression. Obviously this has also an effect on the partner and other relatives of the patient.

Recommendation:

Pain assessment and treatment according to the WHO analgesic ladder protocol] should be included in the care package for persons with HIV infection at all levels.

See also chapter on Home Based Care

11.4. ANTI-RETROVIRAL THERAPY (ART) (Highly Active Anti-retroviral Therapy (HAART))

Anti-retroviral therapy (ART) in combinations of medications against HIV can stop the progression for long periods of time, providing improvements in the health and quality of life of infected persons. It does not cure the infection and the patients have to take the medicines for the rest of their life. For the drugs to work well over time, it is essential for patients to take their drugs exactly as prescribed, which means every single day for life. If doses are often missed it is much more likely that the virus will become resistant and the drugs will stop working.

The establishment of an effective ART program requires a highly functional, well-managed health care program. They are only available in one or two places in Southern Sudan.

National guidelines will soon be available for ART, which will include recommendations for when to start therapy. ART will not be recommended for generally healthy people with HIV infection. In general, ART is only started when patients begin to develop signs and symptoms of advanced HIV infection.

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DERMATOLOGY

12.1. BACTERIAL INFECTIONS

IMPETIGO

Impetigo is a superficial bacterial infection.

Clinical features:

- common in children
- usually starts in the face
- blisters, pustules and crusts
- can be based on underlying eczema

Treatment:

- Soak off the crusts with a Permanganate solution (for 10-20 minutes)
- If severe give Amoxicillin for 5 days
- Prevent spread to other children, separate towels, bedding etc.
- Prevent scratching
- Treat underlying condition

Drug	HF	Paediatric dose	Frequency	Duration
Amoxicillin 250 mg tablets 16mg/kg	U	4 - 10 kg = 125mg 10 - 19 kg = 250mg	3 times daily	5 days
Potassium Permanganate 1:4000 (0.025%)		Soak affected areas	Once a day	When required

BOILS

Clinical features:

- Starts as a painful solid swelling
- In a few days pus will form inside (abscess)
- Often the abscess will break by itself

Treatment:

- Frequent hot compresses
- If a proper abscess is forming then incise and drain
- If there is fever and the draining lymph glands are swollen and tender give Amoxicillin for 5 days
- If an adult has frequent boils there may be an underlying disease, like diabetes or HIV/AIDS

Drug	HF	Adult dose	Frequency	Duration
Amoxicillin 250 mg tablets 16mg/kg	U	500 mg	3 times daily	5 days

CELLULITIS

Clinical features:

- Infection of the deeper tissues and Indistinct borders
- Fever
- Danger of affecting the bone, especially in fingers

Treatment:

- Rest, (for example, elevate legs, or put arm in arm sling)
- Start Cloxacillin
- Refer to a hospital for review and possible surgery
- In a deeper area it is possible to do an aspiration to see if pus is present, then it needs incision

12.1.4. ACNE

Clinical features:

- Often presents in puberty
- Pustules, comedones and scars can be present
- Mainly on face, chest and back

Treatment:

- Stop use of Vaseline, oil or other ointments that block the sebaceous ducts
- Do not give steroid ointments
- Wash with soap and water twice a day
- In severe cases give Doxycycline once daily for a prolonged period (remember not to give in pregnancy or during breast feeding)

Drug	HF	Adult dose	Frequency	Duration
Doxycycline 100 mg	U	100 mg	Once daily	2-4 months

12.2. FUNGAL INFECTIONS

RINGWORM

Clinical features:

- Round scaly lesion, often healing in the centre, no loss of sensation
- On face or body

Management

- Whitfield ointment twice daily for 2 -4 weeks

SCALP RINGWORM

Clinical features:

- Located on the scalp
- Mostly affects children
- Often a messy mixture of hair, fungus and secondary infection
- May result in bald patches

Management:

- Shave the head
- If infected clean wounds daily, If very crusty soak with Permanganate
- Apply Whitfields ointment twice daily for at least 8 weeks
- In case of bacterial super infection administer Amoxicillin for 5 days
- Often local treatment is not enough, if there is no response after 2 weeks:
Give Griseofulvin tablets for at least 6 weeks

Drug	HF	Paediatric dose	Frequency	Duration
Amoxicillin 250 mg tablets 16mg/kg	U	4 -10 kg = 125 mg 10 - 19 kg = 250 mg	3 times daily	5 days
Potassium Permanganate 1: 4000 (0.025%)	U	Soak affected areas	Once a day	As needed
Whitfields ointment	U		Twice daily	8 weeks
Griseofulvin 500 mg	H	10-20 kg = 125 mg 20-30 kg = 250 mg adults = 500 mg	Once daily	8 weeks

SCABIES

Caused by mites, transmitted by skin-to-skin contact

Clinical features:

- Main sites of the burrows (channels of the mites): between fingers, toes, genital area, buttocks or axillae
- Itching is in general present all over the body, because it is an allergic reaction to the mite

Management

- Wash the whole body with soap
- Apply BBL (Benzyl Benzoate Lotion 25%) to the whole body, but not to head and face. For use on children below 5 years, dilute the BBL to half strength (1 part water + 1 part BBL). Make the first application in the clinic and teach the mother
- If there is a super infection clean wounds daily and apply Gentian Violet first
- In severe super infection treat with Amoxicillin for 5 days
- Leave the BBL for 24 hours, then remove by washing thoroughly
- Repeat this the following day
- After treatment wash clothes and bed sheets and dry in the sun
- Treat the whole family
- Itching may continue for a while after treatment due to dead mites

INFANTILE ECZEMA

Infantile eczema is an acute or chronic inflammation of the skin, often seen in children. In some cases a cause can be found. Like a certain food, drug or other substance. If the cause cannot be identified then it can be considered to be atopic dermatitis. Children with atopic dermatitis also often have a tendency to develop asthma.

Clinical features:

- Often seen in small children
- Starts with vesicles (acute stage)
- Develops into itchy rash with dry rough scaly skin
- Severe tendency to scratch
- Secondary infection may cause oozy lesions, crusts, pus, swollen lymph nodes and fever
- often there is a family history of allergy

Management:

General measures:

- Remove the cause if possible
- Explain to the parents the nature of the disease and that it will probably go away over time
- In atopic eczema:
 - Do not use Vaseline
 - Use cotton clothes, not wool or synthetic
 - Do not use soap

- Apply a few drops of baby oil or cooking oil in the bath water for the baby
- Keep fingernails of the child short or cover hands with little cotton socks to prevent scratching

Use of medicines:

- In case of super infection soak with Permanganate
- If infected give Amoxicillin for 5 days
- If the lesions are dry use Hydrocortisone ointment 1% twice a day
- In chronic cases use the Hydrocortisone ointment intermittently. When the child is improving stop it for a week, etc.
- In severe cases, Promethazine can be used in low doses to reduce the itching
In small children

Drug	HF	Paediatric dose	Frequen cy	Duration
Hydrocortisone ointment 1 %	C	Apply lightly	Twice daily	As long as needed, but intermittent
Promethazine* (0.1mg/kg)	C	5-10 kg=1.5 mg 10-15 kg=3 mg 15-20 kg=5 mg	Every night	When required
Amoxicillin 250 mg tablets 16mg/kg	U	4-10 kg = 125mg 10-19 kg = 250mg	3 times daily	5 days
Potassium Permanganate 1: 4000 (0.025%)		Soak affected areas	Once a day	As needed

*Do not use in children below 2 years age**

SEBORRHOEIC DERMATITIS

Clinical features

- Mainly in adults
- Quite common in people with HIV
- Classically greasy scales, especially on scalp, forehead, next to nose, middle upper back, axillae and groins
- It can be mild to very severe and fluctuates

Management:

- Stop application of Vaseline and other oily products
- For minor lesions: Hydrocortisone 1% twice daily
- For widespread/severe lesions:
 - For the scaling apply Salicylic acid 2 % twice daily
 - Apply Hydrocortisone ointment 1% twice daily
 - If very scaly you can first soak with Permanganate solution
- In severe cases offer VCT for HIV

Drug	HF	Paediatric dose	frequency	Duration
Hydrocortisone ointment 1 %	C	Apply lightly	Twice daily	As long as needed, but intermittent
Salicylic acid 2%	H		Twice daily	As long as needed
Potassium permanganate 1: 4000 (0.025%)		Soak affected areas	Once a day	As needed

12.6. VIRAL INFECTIONS

HERPES SIMPLEX:

Clinical features:

Vesicles around the lips / mouth during times of decreased well being (for example before the outbreak of a fever)*

- Vesicles in the genital area
- Highly infectious

Management:

- Avoid close contact with other people
- Keep dry
- Zinc oxide 3 times daily for soothing effect (but don't share the ointment)
- With severe genital herpes try sitting in baths 3 times daily in Potassium Permanganate solution

HERPES ZOSTER (SHINGLES)

Caused by a latent varicella zoster infection in the partially immune host

Clinical features:

- Short period of tenderness / pain
- Then papules appear and change into vesicles

- Always located over one dermatome, mostly in chest or neck area, and always involves only one side of the body
- Pain can be very severe and last for 4 – 6 weeks
- Affects often elderly people or people with reduced immune system, eg. HIV
- Some people develop post herpetic neuralgia, persistent pain / burning which can last for many months

Management:

- Paracetamol / Acetylsalicylic acid (Aspirin) for ten days
- If there is no relief, add Diclofenac (or Ibuprofen)
- Administer antibiotics only if there is super infection
- Clean with Povidone Iodine solution if needed
- If the eye is involved refer to a hospital immediately for treatment with Acyclovir
- **Post-herpetic neuralgia:** If the pain persists after the rash is fully resolved, Amitriptylline or Carbamazepine can be helpful

Drug	HF	Dose	Frequency	Duration
Paracetamol	U	500-1000mg	3-4 times daily	As long as needed
Acetylsalicylic acid	U	300 - 900 mg	3-4 times daily	As long as needed
Diclofenac	C	25-50 mg	2-3 times daily	As long as needed
Amitriptylline	H	75 mg	Every night	As required
Carbamazepine	H	200mg, increase to 400 if needed	Every night	As required

12.7 OTHER DISEASES

URTICARIA

Allergic urticaria may be caused by drugs, infections, plants, insect bites, food, etc. Physical urticaria may be caused by mechanical irritation, cold, heat or sweating.

Management:

- Try to find the cause and remove it
- Give antihistamine by mouth
- Sometimes a cause cannot be found

Drug	HF	Dose	Frequency	Duration
Chlorphenamine	C	4 mg	3 times a day	When required
Promethazine	C	25 mg	Every night	When required

PSORIASIS

Clinical features:

- Chronic condition
- Thickening and scaling of the skin
- Exacerbations can be caused by alcohol, stress, infections or malnutrition
- Not infectious

Management:

- Sun exposure to the lesions for half an hour daily
- Apply Salicylic acid 2 % every night
- In severe cases: use Coal tar ointment 5% in Salicylic acid 2 % twice a day

PELLAGRA

Clinical features:

- Deficiency of Nicotinic acid
- Seen in malnutrition and also in severe alcoholism
- Dermatitis in sun exposed areas
- In advanced cases: mental retardation / dementia

Management:

- Nicotinamide for two weeks
- Diet rich in protein (meat, groundnuts, beans)
- Address underlying problems

Drug	HF	Dose	Frequency	duration
Nicotinamide	H	100 mg	Once daily	2 weeks

ONCHOCERCIASIS

Clinical

- Fibrous nodules usually in pelvic area or on legs
- Intense itching

features:

- Sometimes altered pigmentation, oedema and atrophy
- Eye problems and blindness

Management:

- Annual dose of Ivermectin for ten years
- The first few days the itching can get worse, therefore Chlorphenamine can be administered for 5 days

Ivermectin 3mg tablet

Weight (in Kg)	Height (in cm)	Dose tabs of 3 mg
< 15 Kg	< 90 cm	Do not give
15 to 25	90 - 119	1
26 to 44	120 - 140	2
45 to 64	141 - 158	3
65 Kg plus	159 plus	4

ALBINISM / VITILIGO

Clinical features:

- Albinism is a congenital loss of pigmentation all over the body
- People with albinism often also have poor eyesight
- Vitiligo is loss of pigmentation later in age in localised areas

Management:

- For both conditions there is no treatment
- Reassure the patient that it is not dangerous but there is no treatment so no use of wasting money on all sorts of medicines

WARTS

Warts, including plantar warts usually resolve on their own after months or years. Molluscum contagiosum (warts with a soft content) can be quite contagious.

KAPOSI SARCOMA (KS)

Clinical features:

- Purple black swellings often on the leg but they can present on any part of the body, including in the mouth
- If extensive they cause hard infiltration of the whole limb
- They can ulcerate
- KS is almost always related to HIV infection

Management:

- At the moment there is no treatment in south Sudan
- Advise VCT for HIV

13. NEUROLOGY

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NEUROLOGY

13.1. MENINGITIS

Acute inflammation of the meninges, caused mainly by:

- ❖ *Bacteria (Streptococcus, Haemophilus, N. meningitides serogroups, Pneumococcus)*
- ❖ *Virus*
- ❖ *Tuberculosis*
- ❖ *Cryptococcus (in immunosuppressed people)*

Clinical features:

- Rapid onset of fever
- Severe headache and neck stiffness
- Photophobia
- Haemorrhagic rash (in N.meningitides)
- Convulsions
- Cranial neuropathy
- Bulging fontanel (in children <1)
- Altered mental state, confusion, coma
- TB meningitis has a slower onset, over weeks.

Diagnosis:

- Exclude malaria
- Lumbar puncture

Because the disease is life threatening start antibiotic treatment for meningitis before the laboratory results are known

Management:

- Admit in a hospital
- Antibiotics IV for 10-14 days
- Paracetamol 6 hourly
- Treat convulsions appropriately
- Controlled IV fluids
- If patient is in coma turn the patient every 2 hours
- If there are signs of TB meningitis give TB treatment
- If there are signs of cryptococcal meningitis refer for appropriate treatment (see chapter OI)

Medical treatment:

- First choice for bacterial meningitis is Ceftriaxone for 7 days
- If not available give Ampicillin and Chloramphenicol for 10 days. It is possible to change to oral if the patient is improving
- For treatment of neonates and babies <2 months, administer Ceftriaxone and Ampicillin
- Paracetamol if required

Drug	HF	Dose	Frequency	Duration
Ampicillin inj, IV	H	3 g	Four times daily	10-14 days
Chloramphenicol inj, IV	H	1g	Four times daily	
Ceftriaxone IM	C/H	Adults: 1-2g Children: 75-100 mg/kg	One dose daily	7 days

MENINGOCOCCAL MENINGITIS

Management of an epidemic:

Transmission is airborne, by direct contact with respiratory droplets. Incubation time is 2-10 days (commonly 4 days). Patients are most infectious at onset of disease, but symptomatic carriers are also a major source of transmission. Outbreaks tend to occur in the dry season.

In case of an outbreak / epidemic of meningitis give all suspected cases and contacts of index cases a single dose of Ceftriaxone.

If there is a suspected outbreak inform the county Health department and all other relevant authorities.

If the outbreak is confirmed:

1. Provide Mass vaccination which is appropriate for the present strain
2. Distribute appropriate antibiotics and case management protocols to all health centres
3. Treat according to epidemic protocol
4. Maintain surveillance to track the progress of an epidemic
5. Inform the public

Medical management of meningococcal meningitis

- Ceftriaxone as above
- For contacts without symptoms drugs are not recommended, but information about vaccination and close monitoring of all contacts is vital in controlling an epidemic

13.2. EPILEPSY

Epilepsy is a tendency to recurrent (unprovoked) seizures

Notes:

- Seizures, convulsions or fits all mean the same thing
- A single seizure is not epilepsy
- Febrile seizures in young children, provoked by high fever are quite common and do not (yet) mean epilepsy
- Patients can get a seizure due to an underlying condition like eclampsia, cerebral malaria, meningitis, head trauma, intoxication, etc.
- Some of these conditions, can lead to epilepsy if not fully treated in time
- Always ask for a description from an eyewitness of a seizure

Clinical features grand mal (generalised) seizure:

- Sudden onset, sometimes patient has an “aura” before (a special sensation, or smell)
- Abrupt loss of consciousness
- Involuntary symmetrical movements of all limbs
- Urinary incontinence
- Tongue bite
- Afterwards patient is sleepy, confused and often has a headache

Partial seizure:

- No loss of consciousness
- Recurrent twitching in one part of the body

13.2.1. DIAGNOSIS OF EPILEPSY

You can diagnose epilepsy in a patient, when:

- Age is over 2 years
- Patient has had 2 or more typical generalised seizures in the last year, observed by a relative
- Normal physical examination, no sign of other diseases.
- For partial epilepsy or if you are in doubt it is better to refer to a hospital for diagnosis

13.2.2. TREATMENT OF EPILEPSY

General measures:

- Explain the condition to the parents
- Explain it is a chronic condition, but can be controlled with medication
- Medication probably has to be taken for life
Certain activities are risky for a patient with epilepsy such as swimming, sitting alone close to a fire, driving, etc.
- Often patients fear that a curse, witchcraft or spirits are behind their disease. Explain to the patient that the disease can usually be effectively controlled by medication and that (s)he should continue to take the medication, also in the case when s(he) seeks additional advice from traditional or religious healers.”

Medical treatment:

- Start the patient on Phenobarbitone at the lowest dose
- Explain the side effects: sleepiness, poor concentration, or sometimes hyperactivity
- Review after 2 weeks
- If the patient still has convulsions increase the Phenobarbitone
- Review after 4 weeks
- If the patient has reached the maximum dose of Phenobarbitone and still has convulsions:
- ADD: Phenytoin at bedtime but continue the Phenobarbitone
- Once the seizures are under control then slowly taper out the Phenobarbitone by 30 mg per week
- If the patient cannot settle on either of the drugs refer to the hospital for Carbamazepine

Always try to keep the patient on one drug!

If he is not responding to the maximum dose only then change to another drug

- Once the person is stable you can give medication for 3 to 6 months at a time
- For most patients treatment means lifelong medication
- If a person has had no convulsions for two years, then try to reduce slowly

Phenobarbitone 30 mg tablets (paediatric dose: 5-8 mg/kg)

Age:	2-5 yrs	5-10 yrs	8-12 yrs	12–15yrs	>15 yrs
Wt	10-15 kg	15-20 kg	20-25 kg	25–35 kg	> 35 kg
Starting dose	30mg	30 mg	60 mg	60 mg	60 mg
Maximum dose	60 mg- 90 mg	120-150mg	150 mg	150 mg	180 mg
Use	Give as one daily dose at night				

Phenytoin 100mg (paediatric dose: 4-10 mg daily)

Age:	2-5 yrs	5-10 yrs	8-12 yrs	12–15 yrs	>15 years
Wt	10-15 kg	15-20 kg	20-25 kg	25–35 kg	> 35 kg
Starting dose	50 mg	75 mg	100 mg	100 mg	150 mg
Maximum dose	100 mg	150 mg	200 mg	250 mg	300 mg
Use	Give as one daily dose at night If the patient is stable reduce the Phenobarbitone by 30 mg per week				

Carbamazepine 200 mg tabs (paediatric dose: 16-33 mg /kg)

Age:	2-5 yrs	5-10 yrs	8-12 yrs	12–15 yrs	>15 years
Wt	10-15 kg	15-20 kg	20-25 kg	25–35 kg	> 35 kg
Starting dose	3 x 50 mg	3x75 mg	3x100 mg	3 x 100 mg	3x 100 mg
Maximum dose	3 x 100 mg	3x150 mg	3 x 200 mg	3 x 200 mg	3 x 200 mg
Use	Give 3 times daily If the patient is stable reduce the Phenobarbitone by 30 mg per week				

13.2.3. STATUS EPILEPTICUS

In general a “normal” epileptic attack does not last for more than a few minutes. Even without intervention it resolves on its own. If seizures continue for a prolonged period or the patient does not become conscious between seizures he/she has a status epilepticus. This can be related to epilepsy but often has an underlying cause. This is a life threatening condition and needs urgent action.

Management:

- Protect the airway
- Insert an IV line / cannula
- Administer Diazepam IV slowly as a stat dose
- Repeat Diazepam after 5 minutes if there is no response
- If it is not possible to give IV, then give Diazepam rectally and not IM
- Give Dextrose 50% , diluted with water
- Keep Dextrose 5 % to keep the drip open
- If there is still no response after 30 minutes administer Phenobarbitone IV slowly over 10 minutes
- If patient does not regain consciousness in a few hours give NG tube for glucose, and other feeding

Diazepam injection IV (0.2 mg/kg) 1 ampoule is 10 mg in 2 ml

Age:	<2 mths	2 -12 mths	1 – 5 yrs	5- 15 yrs	>15 yrs
Wt	<4 kg	4-8 kg	8- 15 kg	15-35 kg	>35 kg
Dose (mg)	0.8 mg	1.6mg	3 mg	5 mg	10 mg
Dose (ml)	0.15 ml	0.3 ml	0.6 ml	1 ml	2 ml

Diazepam rectally 1 ampoule is 10 mg in 2 ml

Age:	<2 mnths	2 -12 mnths	1 – 5 yrs	5- 15 yrs	>15 yrs
Wt	<4 kg	4-8 kg	8- 15 kg	15-35 kg	>35 kg
In mg	1-2 mg	2-4 mg	5 mg	10 mg	10-20mg
In ml	0.2-0.4 ml	0.4-0.8 ml	1 ml	2 ml	2-4 ml

Add a piece of tubing to the syringe, then put it a few cm into the rectum. Squeeze the buttocks afterwards for a few minutes.

Phenytoin injection / IV (15 mg/kg) 1 ampoule is 250 mg in 5 ml (50 mg/ml)

Age:	<2 mnths	2 -12 mnths	1 – 5 yrs	5- 15 yrs	>15 yrs
Wt	<4 kg	4-8 kg	8- 15 kg	15-35 kg	>35 kg
In mg	30- 60 mg	60- 120 mg	120-250mg	250-500mg	500 mg
In ml	0.6-1.2ml	1.2-2.4ml	2.4-5ml	5-10ml	10ml

Give the loading dose very slowly, over 10 minutes, commence oral as soon as possible, if needed by NG tube

Dextrose 50 % IV (0.5-1ml/kg) 1 ampoule is 50 ml

Age:	<2 mnths	2 -12 mnths	1 – 5 yrs	5- 15 yrs	>15 yrs
Wt	<4 kg	4-8 kg	8- 15 kg	15-35 kg	>35 kg
In ml	2 ml	5 ml	10 ml	20 ml	50 ml
Dilute with same amount of water					

Further diagnosis:

- Once the patient is stabilized look for underlying causes
- Is there a history of head injury?
- Is the patient pregnant
- Is there a history of epilepsy
- Is there a history of hypertension
- Any chance of intoxication / poisoning
- Check BP, temperature, pupils, signs of fibrillating, look for pregnancy, signs of meningitis
- In elderly people consider stroke
- Laboratory:
 - Malaria
 - White blood count
 - Blood sugar
 - Lumbar puncture
 - If pregnant urine for albumen
- Then treat accordingly

PSYCHIATRY

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PSYCHIATRY

INTRODUCTION

Abnormal behavior and mood changes, are neither always a symptom / sign of mental illness, nor do they always need medication. At times medication can be useful, but social interventions and counseling are also important.

GENERAL GUIDELINES:

- Exclude organic diseases because many physical diseases can cause strange behaviors, e.g.:
 - Malaria
 - HIV related diseases
 - Hypo-/hyperthyroid (endocrine disorders)
 - Sleeping sickness
 - Head trauma
 - Tumors
 - Vitamin deficiencies
 - Poisoning, etc
- Try to involve relatives by explaining the diagnosis and treatment and advice them how best to relate to the patient. Realize that the relatives also need support.
- Get a detailed history, how did it start, any contributory factors such as major loss, stress, signs of substance abuse, look for signs of loss with reality
- Drug compliance is important: whenever medicines are needed for a mental illness they mostly have to be taken regularly and long term. Advise relatives or care takers to give sufficient food to the patient.
- Follow-up of the patient is often needed. Some organizations have trained psycho social assistants.

14.1. PSYCHOSIS

A person with psychosis loses contact with the reality. This condition will manifest through a variety of symptoms, such as delusions, disturbed thinking, hallucinations, and chaotic behaviour. A patient can sometimes be violent, but may also be withdrawn and unable to communicate.

DIAGNOSIS OF PSYCHOSIS

Delusions are false thoughts that are not shared by anyone else in the affected person's environment. The person is convinced that her/his ideas are true, even if there is proof that s/he is mistaken.

Hallucinations mean that a person is seeing or hearing things that are not real, and is convinced that they *are* real.

Disturbed Thinking: When a person's thinking is disturbed, s/he may talk in a way that other people cannot understand what s/he is saying, or follow her/his line of reasoning. There seems to be no logic behind her/his words. Sometimes the person may even talk pure nonsense, using made-up words or incomplete sentences.

Chaotic, disorganized behavior: When the person starts an activity, it becomes a mess or is not completed.

Clinical management:

- Exclude any organic disease
- Treat the patient gently and calmly and offer comforting words of support
- Put the person in a quiet, calm, private room at home or in the clinic. The situation can be made worse by a lot of noise or commotion. In general, patients will be less disturbed in familiar surroundings, where family can help to take care of them
- There should be no dangerous objects that the person can grab to hurt him / herself or others
- Restrain a person who is out of control, but do so gently. Sedation with drugs by a medical staff member is the best way. Using a cloth to tie the legs and arms to the body is another gentle and easy method of restraint. **Do not restrain a psychotic patient with chains**
- Once the person has been secured in a safe environment, ask a few people, preferably family or friends, to watch over the person until there is no longer a risk of harm to anyone
- Give anti-psychotic drugs: If the patient is violent or not co-operative treatment can be started with an intramuscular dose of Chlorpromazine, then continued with oral medication
- Diazepam IM may be added to the first dose of Chlorpromazine. This will facilitate the sedation of the patient, after which the Diazepam can be tapered off and Chlorpromazine continued
- Anti-psychotic medication works gradually. It may take weeks before it shows its full effect
 - Within hours: A patient who is very agitated becomes less aggressive. S/he feels more relaxed and sleepy
 - Within days to weeks: The patient sleeps better and hallucinations (voices/sounds) occur less frequently or are not as loud
 - After weeks: The delusions decrease

DURATION OF THERAPY:

- First / Single episode: continue the treatment for 3 months after the psychotic symptoms have disappeared, then slowly taper it off. However always watch out for signs of relapse.
- Chronic / Repeated relapses: continue maintenance medication long term. The patient should continue even when the symptoms of psychosis seem to have disappeared. Complete instructions should be given to patients and their family members
- Side effects of antipsychotic medication:
 - o Sleepiness (sedation)
 - o Dizziness(orthostatic hypotension)
 - o Restlessness of legs
 - o Acute muscle spasm (dystonia)
 - o Sexual disturbances
- If side-effects of anti-psychotics occur give Biperiden 2mg two times per day

Drug	HF	Daily Dose	Frequency	Duration
Chlorpromazine tabs	C/H	• Start with 300 mg in two divided doses two times/day • Increase up to 600 mg in two divided doses/day • Maximum dosage 900 mg in three doses	2-3 times daily	Minimum of 3 months
Chlorpromazine injection	C/H	*50-200mg IM	Single dose	If necessary
Diazepam injection IM	C/H	20 mg IM	Add to first dose of chlorpromazine if needed	Single dose
Biperiden tabs	C/H	2mg	2-3 times per day	When required

14.2. MOOD AND ANXIETY DISORDERS

Depression and anxiety are normal reactions after a major loss or in a period of insecurity. It can become abnormal when these feelings occur without obvious reason or are more prolonged than normal. In a society where people have been exposed to long term violence and insecurity, many people may experience mental symptoms such as sleeping problems, irritability, easily being violent to spouses or children, constantly remembering bad events, drinking too much alcohol etc.

It is important that health care workers have a basic understanding of how war and violence affect people. Patients with mental problems due to trauma often present with sleeping problems, fatigue and multiple physical complaints. Health care workers can help by giving explanation, medication and by referring patients to projects for psychosocial assistance. A health worker should identify which community resources are available in his/her coverage area. Below some of the most frequently seen mental problems are described.

DEPRESSION

A depression is a period of at least two weeks or longer, in which the person has:

- persistent low mood (feeling sad, empty, anxious) and/or
- lack of enjoyment
- plus other symptoms such as:
 - tiredness
 - loss of appetite / weight loss
 - difficulty concentrating
 - difficulty making decisions
 - loss of sexual desire
 - restlessness / irritability
 - sleep problems (in particular early morning wakefulness)
 - persistent physical symptoms that do not respond to treatment, such as headache, stomach
 - pain
 - constipation / diarrhoea, chronic pain
 - thoughts of worthlessness and uselessness
 - thoughts about death or suicide
 - social withdrawal

MANAGEMENT OF DEPRESSION:

Management of depression and anxiety has two aspects:

A. talking and social interventions

B. medication

If a project for psychosocial assistance is available one can refer

A. TALKING AND SOCIAL INTERVENTIONS:

- Talking can be very helpful for a person who has a depression. The person who is depressed thinks that her / his mood and situation will never change. This belief is one of the symptoms of the illness.

Some guidelines when talking with a depressed person:

- Make the person feel comfortable to talk about her / his feelings
- Emphasize that you will keep confident what s/he tells you
- Listen attentively and sympathetically
- Explain that the person has a depression, and tell her/him something about the treatment
- Emphasize positive aspects during the conversation
- Explore with the person how to think in a different way and what he or she can do to change the situation
- Give the person hope that this condition will change
- If severe cases assess possibility of suicidal behaviour and discuss precautions with patient and family to prevent self harm

B. MEDICATION:

- In mild cases no medication is needed
- In moderate / severe cases: start Amitriptylline 50 mg/day at night. Increase in small steps after 2-3 weeks if the effect is not enough. Maximum dosage 150 mg per day
- Side effects of Amitriptylline include:
 - o tiredness
 - o dry mouth
 - o dizziness: when the person changes position from lying or sitting to standing, s/he will feel dizzy
 - o constipation
 - o blurring of vision
- Note that antidepressants take two or three weeks to start to have effect on the mood. Initially the mood remains unchanged while the patient feels only the side effects. Inform the patient that these effects on the body are not harmful, but a sign that the medication is working. It should not be a reason to stop taking the medication
- Do not give large quantities of drugs at a time, the patient can try to overdose himself / herself
- Often people with anxiety and depression use Benzodiazepines (like Diazepam, Oxazepam). While these initially help to minimize the symptoms they can easily lead to dependency and need to be avoided. Whenever benzodiazepines is prescribed, teach the patient relaxation exercises so that the patient only needs the benzodiazepines for a maximum of two weeks
- Review frequently, and involve community resources such as community organization, psychosocial assistants etc.

Drug	HF	Dose	Frequency	Duration
Amitriptylline tabs	C/H	25-50 mg/day increase slowly (over weeks) if needed maximum dose 150mg/day	Once at night (after supper)	Six months or longer Review regularly

ANXIETY DISORDERS

Anxiety can manifest itself in many systems of the body:

- Gastrointestinal: dry mouth, upset stomach, diarrhoea
- Cardiovascular: increased heart rate /palpitations, high blood pressure, sweating
- Respiratory: fast breathing, chest tightness, chest pain
- Urinary : increased urinary frequency
- Sensory-motor :tingling sensation in fingers or toes, trembling, light headedness, headache
- Dizziness
- Dark spots before the eyes or blurred / unclear vision

Anxiety also affects the mental state of the person. This can manifest in different symptoms such as:

- overwhelming fears and worries
- tension, feeling shaky
- restlessness, feeling tired
- feeling keyed-up, on edge, or jittery
- easily startled by sudden sounds
- insomnia
- always complaining
- unable to concentrate on work or play

When anxiety becomes chronic this can lead to chronic physical symptoms, and a patient can visit a doctor presenting with symptoms of stomach problems, intestinal problems, problems in breathing, pain (chronic tension in the muscles, such as shoulder pain, neck pain, or headache)

MANAGEMENT OF ANXIETY DISORDERS:

- The best solution for anxiety is to help the person solve his /her underlying problem. There may be help from relatives and friends of the patient. If this is not possible, we can assist her / him to adjust to the problem. Medicine can be of help to reduce the symptoms but should be accompanied by advice to change behaviour or way of thinking of the patient. Medicine alone cannot solve anxiety

- Benzodiazepines are medicines that relax the muscles and give a feeling of calmness. They give immediate relief of symptoms but should be prescribed with caution. They should be used for a short period (not longer than two weeks) because of the risk of developing drug dependency. Teach relaxation exercises as described before. Example: diazepam 10 mg twice daily
- In acute anxiety attacks people often start to hyperventilate, which makes them even more anxious: It can help to let them breathe in a paper bag for a few minutes
- Anxiety can be a sign of an underlying depression (see section on depression)

POST-TRAUMATIC STRESS DISORDER

When a person experiences terrifying life-threatening situations (violence, seeing loved ones being killed, rape, serious accidents, robbery) s/he can develop a strong fear reaction. This reaction can last some days or weeks. This is normal. But sometimes the fear reaction persists longer. The person can develop symptoms of post-traumatic stress disorder (PTSD) consisting of

- continually re-experiencing the event through images, thoughts, daydreams, or nightmares and fear in the presence of things that remind the person of the event
- avoiding places and thoughts that remind the person of the event
- arousal: hyper-alertness, strong fear reactions when hearing loud sounds, or being touched, difficulty concentrating, irritability and being angered easily

MANAGEMENT OF POST-TRAUMATIC STRESS DISORDER

The emotional upset associated with terrifying experiences can be very distressing, leading to fear, anger, despair and helplessness. Many persons with trauma feel very lonely and are not able to talk about what happened to them. A health care worker can help in the following ways:

- Tell the person that they have an understandable reaction and the upsetting memories that keep coming back are part of this trauma. Show that you understand their problem, but realize that asking too many questions about the person's experience can make them feel worse
- Discuss with the patient if s/he can utilize religious or traditional resources (traditional healers, religious leaders) to help them understand and accept their tragedy. Religious rituals can have a powerful positive effect on a person suffering from trauma, especially in combination with grief or mourning
- Relaxation exercises, rest and leisure activities are very helpful
- Refer to a psychosocial assistance project if available

14.3. ALCOHOL DEPENDENCE

Alcohol and other substance abuse (tobacco, khat, glue, heroin, etc.) are quite common. Apart from the dangers to the patient they can also be a heavy burden on the family members, in terms of violence, abuse and depletion of the family income.

If a man uses more than 21 units per week and a woman more than 14 units we talk about alcohol dependence. A Unit is 300 ml of beer or one glass wine.

Management:

- In mild to moderate cases counseling can be sufficient, involve relatives and others as appropriate. The patient must stop or dramatically reduce alcohol intake
- In severe cases physical treatment might be needed. The patient can be malnourished and have multiple vitamin deficiencies. He might not be able to look after him/herself
- In severe cases the patient may have withdrawal symptoms like tremors, insomnia, confusion, and hallucinations. Diazepam for 1-2 weeks may be needed

Drug	HF	Dose	Frequency	Duration
Diazepam IV	C/H	10 mg IV	Once only	Once
Diazepam oral*	C/H	20-40 mg	Once daily	Reduce by 5 mg every other day
Multivitami n	C/H	2 tabs	Once daily	2 weeks, then review
Thiamine	C/H	100 mg	Once daily	2 weeks, then review

NB diazepam should not be given continuously for more than 2 weeks

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RESPIRATORY DISEASES

For acute respiratory infections in children see Chapter 1.

For Tuberculosis see chapter on TB

15.1 ASTHMA

Asthma is a chronic disease of the airways leading to muscle spasm, mucus plugging and oedema, resulting in recurrent wheezing, cough, dyspnoea and chest tightness. Eventually it can lead to irreversible damage of the lungs (emphysema)

Clinical features:

- In general the asthma comes in attacks and often starts in childhood
- No fever (if there is fever it is probably a sign of secondary infection)
- Difficult breathing
- Wheezing, rhonchi
- Cough
- In severe attack patient may have in-drawing of muscles in neck and subcostal regions

Diagnosis is mainly made by taking history and clinical features.

Differential diagnoses to keep in mind are:

- Heart failure
- Allergies
- Chronic bronchitis
- TB

Treatment is based on two pillars:

1. treatment of the acute attack
2. maintenance therapy to prevent new attacks.

In most clinics the patient may most likely be in the state of an acute attack

ACUTE ASTHMA ATTACK IN ADULTS:

Clinical features:

- History of cough, dyspnoea and wheezing, often since many years on and off
- Patient prefers sitting hunched position, difficult to lie down
- Dyspnoea and wheezing are obvious
- In-drawings of accessory muscles
- No fever

Management:

- Give Salbutamol inhaler 2 puffs every 10 minutes for half an hour
- Aminophylline IV slowly over 10 minutes. For an adult of 40-50 kg this means one vial of 250 mg
- Hydrocortisone 200 mg IV
- If neither Salbutamol nor Aminophylline are available, then administer Adrenaline SC, repeat after 1 hour if needed
- If the condition of the patient is satisfactory after one hour send him/her home on maintenance therapy. If not admit.
- During admission:
 - o Administer nebulised Salbutamol
 - o Continue Aminophylline in D/W slowly over 24 hours
 - o Administer Prednisolone 40 mg daily
 - o If there is any sign of infection treat with Ampicillin / Amoxicillin
- On discharge always give maintenance therapy and a review date

Drug	HF	Dose	Frequency	Duration
Aminophylline IV	C/H	6mg/kg over 20 minutes	Bolus dose (once) (do not give if patient had Aminophylline in the last 8 hours)	
Aminophylline IV In D/water 5%	C/H	12 mg/kg/24 hours in 2 litres	As long as needed	
Hydrocortisone IV	C/H	200 mg IV	Bolus dose	once
Adrenaline 1:1000 SC	C/H	0.5 ml SC	Repeat after one hour if needed	
Salbutamol nebulised (in saline or sterile water)	H	5 mg Oxygen at 6 litres per minute	Repeat after one hour if needed	Until recovered
Prednisolone tablet	C/H	40 mg	Once daily	7 days, then taper off by 5 mg daily

ASTHMA ATTACK IN CHILDREN

Management:

- The same general measures apply as in adults
- Let the mother stay with the child
- Explain what you do and reassure the child
- For children it is difficult to use an inhaler properly, it helps to attach it to a spacer. This can easily be made from an empty plastic bottle

Take an empty plastic bottle. Cut an opening in the bottom that will closely fit the opening of the inhaler. Add two puffs in the inhaler. Then let the child breath in and out of the other end of the device for 30 minutes

Drug	HF	Paediatric Dose	Frequency	Duration
Aminophylline IV 250 mg/10ml	C/H	4mg/kg over 20 - 30minutes, e.g. 12 kg = 48 mg =2ml 25 kg = 100 mg= 4ml 36 kg = 150 mg= 6 ml	Bolus dose (once) (do not give if patient had Aminophylline in the last 8 hours)	
Aminophylline IV In D/water 5%	C/H	1 mg/kg/ hour, e.g. 12 kg = 4ml in 300 ml D/W in 12 hours 25 kg = 8ml in 500 ml D/W in 12 hours	As long as needed	
Hydrocortison e IV/IM	C/H	< 8 kg 50 mg IV/IM > 8 kg 100mg IV/IM	Bolus dose	once
Adrenaline 1: 1000 SC	C/H	0.01 ml/kg SC	Repeat after one hour if needed	
Salbutamol nebulised (in saline or sterile water	H	< 5yrs = 2.5 mg/2ml Oxygen at 6 l/min > 5 yrs= 5mg/2ml	Repeat after one hour if needed	Until recovered
Prednisolone tabs	C/H	1-2 mg /kg,e.g. 6-10 kg = 10mg 10-20 kg = 20 mg 20-30 kg = 30 mg	Once daily	5 days, then taper off daily

MAINTENANCE THERAPY:

PREVENTION:

- Stop smoking, avoid being in smoky areas
- For some people being in close contact with animal can provoke attacks
- Normal exercise should be encouraged when not in attack
- Do not use antibiotics routinely with asthma patients if there is no definite sign of infection
- Avoid overweight

MEDICATION:

- The best option is an inhaler with Salbutamol, this inhaler can be used on a regular basis or in mild cases only when needed, e.g. before exercise. As inhalers are still quite expensive and need really good instruction to be effective an alternative is tablets
- First choice is Salbutamol tablets. If this is not sufficient Aminophylline can be added. If a patient is without complaints for 2 weeks it can be stopped and restarted when needed
- In severe cases Prednisolone may be required. In acute exacerbations it is good to give a short course of high dose Prednisolone tapering off after a week
- In severe asthma, if the patient remains symptomatic a continuous low dose of Prednisolone may be needed, like 5 – 10 mg but remember that long term Prednisolone can have major side effects
- Review treatment regularly

Drug	HF	Dose	Frequency	Duration
Salbutamol inhaler	C/H	200-400mcg	2 times a day	Continuous or as needed
Salbutamol tablets	C/H	4mg	3 times daily	continuous
Aminophylline tablets	C/H	100 mg	3 times daily	continuous
Prednisolone tablets	C/H	30 mg	once daily	Taper of after one week
Prednisolone maintenance if needed	C/H	2.5 – 10 mg	Once in the morning	Continuous

15.2. COMMON COLD

This is a viral disease and does not need any antibiotics.

Management:

- Paracetamol if needed
- Plenty of fluids, especially warm drinks
- Saline drops can be put in each nostril if the nose is blocked
-

15.3. ACUTE BRONCHITIS

This is acute infection of the bronchi, mostly viral. High fever and thick yellow/green sputum are an indication of bacterial super infection.

Management:

- Paracetamol
- Plenty of fluids
- In case of bacterial infection: Doxycycline (not in pregnancy or during breastfeeding), Cotrimoxazole or Amoxicillin

Drug	HF	Dose	Frequency	Duration
Paracetamol 500mg	U/C/H	500 mg	1-2 when required	
Doxycycline 100mg	C/H	100 mg	2 times per day	5 days
Cotrimoxazole 480mg	U/C/H	960 mg	2 times daily	5 days
Amoxicillin 500 mg	U/C/H	500 mg	3 times daily	5 days

15.4. PNEUMONIA

Infection and inflammation of the lungs, two major types:

- o *Bronchopneumonia, involving the bronchi, common in children and the elderly*
- o *Lobar pneumonia involving one or more lobes, common in young people*

Causes are aspirations of secretions of the upper airways and inhalation of droplets small enough to reach the alveoli, containing pathogenic organisms. These organisms vary according to age and whether the infection is acquired in the community or the hospital.

Clinical features:

BRONCHOPNEUMONIA

- Rapid breathing
- Cough, purulent sputum
- Lung crepitations (heard with a stethoscope)
- Fever, tachycardia, fatigue
- Difficulty in breathing (dyspnoea), flaring of nostrils
- In severe cases: chest in drawing, cyanosis.

LOBAR PNEUMONIA:

- Chest pain of sudden onset, rigors, high fever, vomiting, malaise
- Sputum, rust colored, occasionally blood stained
- Respiration rapid shallow and painful
- Tachycardia, in severe cases cyanosis
- Bronchial breathing (heard with a stethoscope)

Note: especially in the elderly or in HIV infected patients confusion or disorientation may be the main presenting sign.

Treatment:

For treatment of children below 5 years (See chapter 1)

For children over 5 years and adults:

Management of moderate pneumonia:

- Treat as an out patient
- Amoxicillin for 5 days Or
- Erythromycin for 5 days in atypical pneumonia (especially for mycoplasma pneumonia)
- Paracetamol
- Rest and plenty of fluids

Management of severe pneumonia:

- Admit
- Benzyl Penicillin and Chloramphenicol IV for 1 week
- If patient improves soon, change to oral Amoxicillin and Chloramphenicol
- Oxygen if needed
- Alternative schedule: Benzyl Penicillin and Gentamicin

Drug	HF	Dose	Frequency	Duration
Benzyl Penicillin	C/H	2MU	4-6 hourly	7 days
Chloramphenicol	C/H	1 g	6 hourly	7 days
Gentamicin	C/H	5-7 mg/kg/day e.g. adult of 40kg : 200 mg e.g. adult of 60 kg : 300 mg	In one or 2 doses	7 days

If no improvement on the above treatment consider TB, PCP (Pneumonia cause by *Pneumocystis carinii*) and /or HIV: (see also chapter on TB and HIV)

- Do three sputum tests
- Advise the patient for an HIV test
- Arrange for an x-ray if possible

15.5. PNEUMOCOYSTIS CARINII PNEUMONIA (PCP)

This is an opportunistic infection only occurring in patients with advanced HIV.

Clinical signs:

- Cough
 - Usually dry
 - Days to weeks
- Shortness of breath
 - Can be acute (days) or insidious (weeks)
 - Can be extreme
- Fever
- Cyanosis
- Other signs of HIV infection may be present
- X ray shows bilateral fine mid zone infiltrates

Management

If Pneumocystis is suspected, refer to hospital for evaluation.

- Admit
- High dose Cotrimoxazole is recommended therapy:
 - 120mg/kg per day in 3-4 doses
 - Eg: Dose for a 60kg man is 7200mg/day
 - 7200mg / 480mg = 15 tablets per day, approx 4 tabs qds
 - If severe respiratory distress or cyanosis present, add prednisolone
- Supportive therapy if necessary
 - Oxygen therapy
 - IV fluids
- If HIV status not known advise patient on testing

NB: Long term secondary prophylaxis with Cotrimoxazole needed (CPT)

Drug	HF	Daily Dose	Frequency	Duration
Cotrimoxazole 480 mg tabs treatment	H	120 mg /kg/day e.g. 60kg=7200mg/day =4x4 tablets /day e.g.40kg=4800mg/day= 3x3 tablets/day	3-4 times/day	21 days
Prednisolone 5mg	H	30 mg	Once daily in the morning	Taper down by 5 mg/day after 14 days
Cotrimoxazole prophylaxis	H	Adult dose 960 mg	Once a day	Life long

15.6 EMPYEMA

If there are signs of substantial pleural effusion/fluid, either confirmed clinically (with absent or distant air entry and with extreme dullness on percussion) or by X-ray, aspirate to confirm.

If the fluid is clear the most likely diagnosis is TB. (See chapter on TB)

If the fluid is cloudy / pussy treat as empyema:

Management:

- Admit
- Start patient on benzyl penicillin and Metronidazole
- Drain pleural space with a large intercostal tube and an underwater seal

Drug	HF	Dose	Frequency	Duration
Benzyl Penicillin IV	H	2.5 MU	6 hourly	10-14 days
Metronidazole PO	H	400 mg	3 times a day	10-14 days

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CARDIOVASCULAR CONDITIONS

16.1. HYPERTENSION

GENERAL NOTES:

- Do not diagnose hypertension lightly. Unless the BP is extremely high wait for 3 readings with 1 or 2 weeks interval
- Do not start medication lightly.
- First try a non drug approach:
 - Stop smoking
 - Reduce obesity
 - Reduce salt intake
 - Reduce fat and sugar intake
 - Increase moderate exercise
- Once the decision is taken to start medication it is important that the patient takes it regularly. Taking medicine irregularly is not beneficial and may even be harmful due to fluctuations in pressure therefore treat hypertension seriously
- In general high blood pressure has few or no symptoms, so the patient needs regular follow up
- The exception is in pregnancy. If the blood pressure goes up in pregnancy take this seriously and urgently. However different drugs and interventions are needed. See chapter on obstetrics.

GUIDELINES FOR TREATMENT WITH MEDICINES

- Start with first line drug, preferably Hydrochlorothiazide
- Start with the lowest recommended dose
- If there is no effect after 2 weeks increase the dose
- If there is still no effect after 3 months **add** a second drug (it means do not replace but give both)
- If there is no effect after 3 months refer to a hospital for a second line agent
- If the blood pressure is dangerously high you may have to refer earlier
- When the blood pressure has stabilized monitor every 1-3 months
- When the patient is young (<30 year) refer to a hospital

Drug	HF	Dose	Frequency	Duration
Hydrochlorothiazide 25 mg	C/H	12.5-25mg	Once daily	Long term (not to be used in pregnancy)
Atenolol 50 mg	C/H	50 mg	Once daily	Long term
Captopril	H	12.5-50mg	2 times daily	Long term

SEVERE HYPERTENSION

Definition: diastolic blood pressure > 120 mm Hg

Be careful with emergency treatment as drastic lowering may result in e.g. a stroke or myocardial infarction.

INDICATIONS FOR EMERGENCY TREATMENT

left ventricular failure with pulmonary oedema

- Hypertensive encephalopathy (severe headache and confusion)
- Severe pre-eclampsia (*See chapter on obstetrics*)
- If the patient just had a stroke, caution must be exercised when lowering the blood

pressure as it may worsen the stroke. Monitor the blood pressure, if the reading is 210/110 or less then, DO NOT treat with drugs urgently

Management:

- Admit
- Strict bed rest
- Check the blood pressure every half hour
- Aim to reduce the diastolic BP to 100-110 within 1 hour
- Administer Furosemide IV or Hydralazine IV slowly

Drug	HF	Dose	Frequency	Duration
Furosemide 20 mg vials	C/ H	40 mg IV	once	Once (Not to be used in pregnancy)
Hydralazine	H	5-10 mg slowly diluted with 10 ml Sodium Chloride 0.9 %	once	If necessary repeat after 30 minutes

16.2. CARDIAC FAILURE

Usually presents with shortness of breath, swelling of ankles, hepatomegaly, ascites and easy fatigability.

General management:

- Admit
- Rest; prop up with pillows or backrest, patient can often not lie flat
- Restrict salt and fluid intake
- Examine the patient and consider underlying diseases like:

- o Hypertension
- o Myocardial infarction
- o Anaemia
- o Arrhythmias
- o Infections, e.g. sub-acute bacterial endocarditis or severe chest infection
- o Thyrotoxicosis
- o Drugs, e.g. Digoxin overdose
- o Pulmonary embolism
- o Hypokalaemia (a lack of potassium)
- o Treat the underlying disease as best as possible

Drug management:

- In severe cases start with IV Furosemide
- Then continue with oral treatment
- With Digoxin establish if the patient has taken it recently, (s)he may have an intoxication, especially an elderly person
- If the patient has not recently used Digoxin you can start with 2 doses on the first day as a loading mechanism

Drug	HF	Dose	Frequency	Duration
Furosemide 40mg tablet (in severe cases first dose IV)	C/H	40-80 mg	Once daily	Long term/depending on underlying cause
Potassium Chloride 600mg tablet	H	600-1200 mg	1-2 times a day	Useful if high doses of Furosemide are given
Captopril 12.5mg tablet	H	12.5-25 mg	2 times a day	Long term
Digoxin 62.5mcg	H	0.125-0.25 mg	daily	Long term

16.3. RHEUMATIC HEART DISEASE

This is a complication of streptococcal A disease, mostly tonsillitis. This infection can lead to permanent damage of the cardiac valves.

Most involved are:

- o Mitral valves: leading to narrowing, incompetence (leaking) or both.
- o Aortic valves: leading to narrowing and incompetence

Clinical features (at the chronic stage):

- Dyspnoea
- Palpitations, tachycardia
- Heart murmurs
- In mild cases patient may be asymptomatic and the murmur can be an incidental finding
- Congestive cardiac failure (oedema, hepatomegaly, ascites, etc)

Diagnosis:

- Clinical examination (murmurs, heart failure)
- X-ray
- Echocardiography

Management:

ACUTE CARDITIS:

- o Bed rest
- o Amoxicillin for 10 days (start with Benzathine Penicillin as a stat dose)
- o Acetylsalicylic acid (Aspirin) 4 times daily
- o With significant murmur or congested cardiac failure (CCF):
Prednisolone 1-2 mg/kg OD for approximately 8 weeks
- o If there is associated congestive cardiomyopathy: consider Furosemide + Digoxin

Chronic stage:

- Benzathine Penicillin monthly
- Antibiotic protection at time of dental and surgical procedures
- Symptomatic management when required (Furosemide, etc see cardiac failure)
- In severe cases an operation of the valves may be necessary/possible

Drug	HF	Dose	Frequency	Duration
Benzathine Penicillin	C/H	Adult : 2.4 MU IM Child> 30 kg 1.2MU IM Child< 30 kg 0.6MU IM	Once a month	Continue upto the age of 21 years
Amoxicillin 250 mg tablets 16mg/kg/dose	U	Adult: 500 mg 4 - 10 kg = 125 mg 10 - 19 kg = 250 mg	3 times daily	Complete 10 days
Acetylsalicylic acid (Aspirin)	H	25 mg/kg e.g. child of : 10 kg: 250 mg 20 kg: 500 mg 30 kg: 750 mg	3 times daily 3 times daily 3 times daily	Until acute symptoms are over, then gradually taper off
Prednisolone 5mg tablet	H	1-2 mg/day: e.g. child of 10 kg: 10 mg 20 kg: 20 mg 30 kg: 30 mg	Once daily Once daily Once daily	3-4 weeks then review; when improving gradually taper off

16.4. ISCHAEMIC HEART DISEASE

A condition in which there is insufficient blood flow through the coronary arteries of the heart thus leading to ischemia and/or infarction, often related to hypertension, diabetes or unhealthy lifestyle.

Clinical features:

- Chest pain on the left / central part of chest
- Tightness or oppression of chest
- Pain / tightness gets worse on exercise and better with rest
- At times associated anxiety, sweating and vomiting
- Pallor, tachycardia
- Low (or high) blood pressure
- Arrhythmia, this can cause sudden death

Management:

Prevention/reduction of risk factors:

- Stop smoking
- Lose weight if overweight
- Control hypertension
- Control diabetes
- Reduce fat and sugar
- Encourage moderate exercise
- Reduce stress

Management of attacks:

- Rest
- Acetylsalicylic acid (Aspirin) chew slowly
- Glycerin Trinitrate sublingual
- If there is no response add Atenolol 50 mg
- If there is still no response patient probably has a cardiac infarction

A CARDIAC INFARCTION:

- Refer to the hospital
- Administer Oxygen
- Set up Dextrose 5% infusion
- Add morphine as required
- Put patient on Captopril long term
- Control the underlying diseases
- After the acute stage:
 - Rehabilitate slowly
 - Educate about healthy lifestyle
 - Continue the long term medication
 - Give low dose Acetylsalicylic acid (Aspirin) daily

Drug	HF	Dose	Frequency	Duration
Aspirin	C/H	300mg, chew slowly 75-150 mg once daily		once long term
*Glyceryl trinitrate 500mcg (Under the tongue)	C/H	500 mcg	Repeat after 10 minutes if needed	Maximum of 3 doses in half an hour
Atenolol 50mg tablet	C/H	50 mg	Once daily	Long term
Morphine 10mg injection	H		4-6 hours	As required
Captopril 12.5mg tablet	H	12.5-25mg	Two times daily	Long term

*discard tablets 8 weeks after opening the container

16.5 ATRIAL FIBRILLATION

A condition in which the heartbeat is very fast and irregular: The atria fibrillate, but conduction of the impulse to the ventricles is irregular and cardiac contraction and peripheral pulses are irregular.

Management:

- Look for underlying diseases, like hyperthyroidism, congestive heart failure, or recent heart attack
- Digoxin, first day give the loading dose, then once daily
- If heart rate remains very high after 3-4 days, consider adding Atenolol
- Give the patient low dose Acetylsalicylic acid (Aspirin) daily to prevent embolism; continue even if irregular rhythm reverts to normal

Drug	HF	Dose	Frequency	Duration
Digoxin 62.5mcg tablet	H	0.25 mg then 0.125 - 0.25 mg	3 times a day Once a day	First 24 hours only Long term
Atenolol 50mg tablet	C/H	25-50mg	Once a day	Long term
Aspirin 75mg tablet	C/H	75-150 mg	Once a day	Long term

16.6. ENDOCARDITIS

Patients/children with pre-existing deformities of the cardiac valves are more prone to develop endocarditis. Suspect endocarditis in the following cases:

- Patient is very ill
- Prolonged fever
- Heart murmurs on examination
- No response to anti malarias and common antibiotics

Treatment:

Refer to the highest level. Treatment is prolonged IV antibiotics preferably after blood cultures.

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RENAL TRACT CONDITIONS

17.1. URINARY TRACT INFECTIONS (UTI)

Usually presents with dysuria, frequency and urgency of micturition, and lower abdominal pain. It is far more frequent in women compared to men. In men always consider an STI first. With a UTI urine is often cloudy and smelly.

Clinical features:

- Dysuria
- Frequency and urgency
- Lower abdominal pain
- Urine is often cloudy and smelly

Diagnosis:

- Confirm with microscopy
- In men exclude STI's
- If a UTI is confirmed in men look for the underlying causes like bilharzias or bladder stones (in older men also think of prostate problems)
- Note: only "hotness" of urine is not a sign of UTI
- Neither is it per definition a sign of UTI if a baby cries at urination. Most babies do that.

Management:

- Confirm with microscopy
- Plenty of fluids
- Cotrimoxazole
- In men always with a proven UTI consider an underlying problem, like bilharzias or bladder stone
- In pregnant women give Amoxicillin

Drug	HF	Dose	Frequency	Duration
Cotrimoxazole 480mg tablet	U/C/H	Adult: 960 mg >12 yrs: 960 mg 6-12 yrs : 480 mg	Two times daily	5 days
Amoxicillin 500mg capsule	U/C/H	500 mg	Three times daily	5 days

17.2. ACUTE PYELONEPHRITIS

Clinical features:

- Signs of a UTI, although dysuria may be absent
- High fever and rigors
- Nausea and vomiting
- Loin pain

Management:

- Rest
- Paracetamol
- In very ill patients IV antibiotics till the fever is reduced then change to oral
- If there is no response to Ampicillin after 48 hours add Gentamicin IV
- Plenty of fluids
- Antibiotics for two weeks

Drug	HF	Dose	Frequency	Duration
Amoxicillin 500mg capsule	U/C/H	500 mg	3 times daily	14 days
Ampicillin IV inj. 1 Gm	C/H	1000 mg	4 times daily	Till patient can take oral Amoxicillin
Gentamicin IM 80mg/2ml	H	1-2 mg/kg (for children the whole dose (5-7.5 mg/kg can be given in a single dose daily	3 times daily	5 days

17.3. ACUTE GLOMERULONEPHRITIS

Acute glomerulonephritis is an acute inflammation of the glomeruli, caused by an immune reaction (usually 1-5 weeks after a streptococcal skin or throat infection)

Clinical features:

- Common in children above 3 years and adolescents
- Haematuria (red or tea colored urine)
- Oedema
- Reduced urine output
- Urine shows protein and red cells on microscopy
- Malaise, anorexia, vomiting and headache can be present
- Hypertension
- In advanced stages convulsions or dyspnoea

Management:

- Admit
- Try to induce diuresis with small doses of Furosemide. If the patient responds well continue with a regular dose
- If pt very ill or not responding to oral dose try IV
- If it is suspected to be caused by a recent streptococcal infection give a course of Amoxicillin
- Record fluid input and urine output
- Record weight and BP daily
- Treat if the diastolic BP >90mm Hg
- Do not give steroids
- Check urine daily
- If the output of urine is not satisfactory after 5-7 days refer to a specialist

Drug	HF	Dose	Frequency	duration
Amoxicillin 500mg capsule	U/C/H	500 mg	3 times daily	5 days
Furosemide 40mg tablet	C/H	Adult: 40 -80 mg Child: 5-10 kg=10 mg 10-20 kg= 20mg 20-40 kg= 40mg	Once daily	As long as needed
Furosemide 10mg/ml IV injection	C/H	Adult: 40 mg IV Child: 5- 10kg=10 mg 10-20kg=20 mg 20-40kg=40 mg	Once daily Can be repeated after 4-6 hours if no result	Change to oral as soon as possible

17.4. NEPHROTIC SYNDROME

Clinical features:

- Generalized oedema
- Proteinuria: ++ or higher
- Oliguria

Management:

- Admit
- Limit fluids to 1 litre per day till diuresis is satisfactory
- Monitor input /output
- Monitor the weight and BP
- Check urine daily
- Try and induce diuresis with Frusemide
- If there is no result refer to hospital

Management in the hospital:

- Change Furosemide to IV
- If possible measure urea and electrolytes
- If still no result add Prednisolone as a trial
- If no improvement after 2 weeks try to refer to a state / tertiary hospital

Drug	HF	Dose	Frequency	Duration
Furosemide 10mg/ml IV injection	H	Adult: 40 mg IV increase to 200 mg IV if no result. Child: 5-10kg=10 mg 10-20kg=20 mg 20-40kg=40 mg	Once daily If high doses divide over the day	Change to oral as soon as possible
Prednisolon e 5 mg	H	1mg/kg e.g. child 5 kg= 5 mg child 10 kg=10mg child 15kg =15mg child 20 kg=20mg etc. adult of 60 kg= 60mg	Once a day in the morning	2 months, then taper off. If no result after 2 weeks, refer

17.5. RENAL FAILURE

ACUTE RENAL FAILURE

If the patient fails to pass sufficient urine the problem can be caused at three different levels: before the kidney (pre-renal), in the kidney (renal) or after the kidney (post-renal).

PRERENAL FAILURE:

This is the case when there is not enough circulation for the kidney to produce urine. This can be caused by:

- *Bleeding (internal or external)*
- *Dehydration*
- *Other causes of hypotension like heart failure or poisoning*

Management:

- Identify the cause and treat
- Rapid input of IV fluids, start with saline
- Record input / output
- If the patient is very ill / unconscious catheterize to monitor the urine output

POST RENAL FAILURE:

This is caused by a failure of the bladder to empty. It can be easily diagnosed by abdominal palpation as a distended bladder. The patient is often restless and in distress. It can be caused by:

- *Obstruction, e.g. enlarged prostate, malignancies, stones*
- *Neurological causes like spinal lesions*

Management:

- In the acute stage catheterize
- Define and treat the underlying cause
- In case of a neurological cause (spinal trauma) intermittent self catheterization is the best option even in Sudan (see chapter on rehabilitation)

RENAL FAILURE:

If pre- and post renal failure is excluded there is damage to the kidney itself. This can be caused by:

- *Sepsis, severe malaria*
- *Acute glomerulonephritis*
- *Nephrotoxic drugs*

Clinical features:

- | | |
|--|--------------------------------|
| • No or very little urine output
(less than 1 ml/kg/hr) | • Nausea/vomiting / anorexia |
| • Generalized edema | • Dyspnoea |
| • Hypertension | • Convulsions / encephalopathy |

Management:

- Admit

- Monitor fluid input and output
Limit daily fluid intake:
Daily fluid requirement = 500 ml + total of losses through urine, vomit and diarrhoea from the previous day
- Restrict salt and potassium intake
- Check BP 2 times per day
- Check urine for protein and microscopy
- Treat any causes or complications like sepsis, hypertension and convulsions
- Do not give nephrotoxic drugs
- Refer to a higher level as soon as possible

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GASTRO INTESTINAL CONDITIONS

18. 1 ACUTE DIARRHOEA & ASSOCIATED CONDITIONS:

For diarrhoea in children see Chapter one on paediatrics.

1. GASTRO ENTERITIS

Gastroenteritis is mostly caused by food poisoning or a virus.

Management:

- Re-hydrate if possible orally with ORS and other fluids, in severe cases with IV fluid. In severe cases start with Ringers lactate. Monitor closely and frequently and decide on input accordingly.
- If there is severe vomiting administer Promethazine
- Do not give antibiotics except in the specific situations below
- Do not give anti diarrhoeal medicines

Drug	HF	Dose	Frequency	Duration
Promethazine 25 mg/ml	C/H	12.5-25 mg IM	One dose	review
Promethazine 25 mg tablet	C/H	25 mg	2-3 times daily	review

2. DYSENTERY (BLOODY DIARRHOEA):

Dysentery can be caused by either bacteria (Shigellae, Campylobacter), Amoebae or in some areas Bilharzia.

General management:

- Re-hydration
- Check for anaemia
- Test the stool for microbial content
- For Shigella: give Ciprofloxacin
- For amoebae: give Metronidazole
- For bilharzias: give Praziquantel

Drug	HF	Dose	Frequency	Duration
Ciprofloxacin 250 mg tabs	<u>U/C/H</u>	500 mg	2 times daily	3 days
Metronidazole 200 mg tabs	<u>U/C/H</u>	800 mg	3 times daily	5 days
Praziquantel 600 mg tabs	<u>U/C/H</u>	1.8-2.4g	Single dose	

3. CHOLERA

Classic cholera is characterised by sudden onset, severe acute painless diarrhoea (rice-water stools), vomiting and – without treatment - rapid dehydration. Incubation period is normally 2-4 days. It is spread by faecal-oral route.

A cholera outbreak is a medical emergency and needs to be dealt with immediately.

AT ANY LEVEL PRESENTING CHOLERA

General measures:

- In suspected cases notify the County Health Department immediately and obtain advice on management!
- Take stool samples, handle samples carefully with gloves and send to a laboratory
- Treat the patient(s) on site, DO NOT refer
- Admit in a temporary ward (school, church)
- Arrange proper disposal of stools and vomit in a pit latrine

Food / Fluids:

- Re-hydrate according to severity of dehydration (See pg....)
- If moderate give ORS, if severe give IV fluids
- Monitor frequently, at least 4 hourly

Antibiotics:

- In adults and children above 8 years give Doxycycline
- In children below 8 years give Cotrimoxazole

Further management:

- Chlorination of public water supply
- Inform and educate the community in a controlled manner

Drug	HF	Dose	Frequency	Duration
Doxycycline 100 mg	U/C/H	Adults: 300 mg Children above 8 yr: 100 mg	Single dose	
Cotrimoxazole 240mg	U/C/H	Child 5-8 yrs : 480 mg 6 mnths-5 yr 240 mg < 6 months 120 mg	2 times daily	5 days

4. PERSISTENT DIARRHOEA

Persistent diarrhoea is diarrhoea lasting for longer than 14 days, without blood in the stool. It can be caused by:

- o infection
- o malabsorption, e.g. in malnutrition
- o HIV infection
- o Intolerance for lactose or gluten
- o or a combination of the above

General measures:

- Give vitamins and minerals if available
- Test for giardiasis in a stool sample
- Ask if any worms were seen
- Monitor the weight
- Consider underlying diseases like HIV/AIDS, kala azar TB, etc

Antibiotics:

- Treat giardiasis with Metronidazole

Fluids / Feeding:

- Give foods rich in vitamin A, Folic acid and Zinc: liver, kidney, dark green vegetables, beans, groundnuts and fish

Drug	HF	dose	Frequency	Duration
Metronidazole 200 mg	<u>C/H</u>	2 g	Once daily	Single dose

If no cause is found and the patient is found to be HIV positive or to have another terminal disease consider symptomatic treatment: Codeine or Loperamide

Drug	H F	Dose	Frequency	Duration
Codeine phosphate 30 mg tabs	H	15-60 mg	Up to 4 times a day	Increase or reduce as needed
Loperamide 2 mg capsule	H	2 mg to max 8 mg	2 times daily	Increase as needed, then maintain

5. CONSTIPATION AND HAEMORRHOIDS

Haemorrhoids often go together with constipation

Management:

- Encourage high fibre diet and lots of fluid
- Encourage fresh fruit and vegetables
- Lemon grass tea can be helpful
- Encourage exercise
- Do not give laxatives lightly and avoid chronic use: Senna can be useful
- For haemorrhoids: avoid constipation. Saline baths can bring relief

6. DYSPEPSIA AND ULCERS

6.1. REFLUX OESOPHAGITIS:

General management:

- Lose weight
- Elevate head of bed
- Avoid tight clothes
- Avoid large meals
- Stop smoking
- Reduce alcohol
- Reassure patient

Drug treatment:

- For mild cases administer Magnesium Trisilicate
- In severe cases you can try a course of Ranitidine

Drug	HF	Dose	Frequency	Duration
Aluminium hydroxide	<u>C/H</u>	2 tablets	4 times a day	As required
Ranitidine	<u>H</u>	300 mg	Before night	4-8 weeks

6.2. PEPTIC ULCER

Clinical features:

- Epigastric pain :
 - In duodenal ulcer worse at night and when hungry
 - In gastric ulcer worse with food
- Nausea / vomiting
- Regurgitation

General management:

- Reduce spices
- Stop alcohol and smoking
- Limit coffee / tea to one cup per day

- Avoid painkillers and steroids
- Encourage relaxation and exercise
- Do not give long term treatment without proper diagnosis

Drug treatment:

- Mild cases try Aluminium hydroxide
- In severe cases try a course of Ranitidine

Drug	HF	Dose	Frequency	Duration
Aluminium hydroxide	<u>C/H</u>	2 tablets	4 times a day	As required
Ranitidine	<u>H</u>	300 mg	Before night	4-8 weeks

Refer for further investigations and possible surgery in case of:

- ❖ No proper response to medication
- ❖ Excessive vomiting
- ❖ Vomiting of blood
- ❖ Obvious weight loss
- ❖ Sudden acute abdominal pain / shock can be a sign of perforation

7. HELMINTHIASIS

Most transmission of worms goes via food, water and dirty hands. Hookworm enters the host by active penetration of the larvae in the stool through intact skin. Studies have shown high prevalence of hookworm in Juba(>30%) and eastern Equatoria. Prevalence of the other worms is lower. High worm load can contribute to malnutrition and anaemia.

7.1. ASCARIASIS (ROUND WORM):

Symptoms:

- Abdominal or respiratory symptoms
- history of passing worms

Confirmed if

- round worms are seen (can be from anus, mouth, or nose)
- typical eggs are seen in the stool (microscopy)

7.2. HOOKWORM

Symptoms:

- Severe anaemia for which there is no other obvious cause

Confirmed if:

- hookworm eggs are seen in the stools (microscopy)

7.3. TRICHURIASIS: (WHIPWORM)

Symptoms:

- Bloody, mucoid stools

Confirmed if:

- whipworm eggs are seen in the stools

7.4. ENTEROBIUS VERMICULARIS (PINWORM)

Symptoms:

- Perianal itching
- Small 1cm long white worms seen around anus or on stool

7.5. TAENIA SAGINATA (BEEF TAPEWORMS)

Management:

Worms	Drug	Adults	Children above 2 yrs
Pinworm	Mebendazole 100mg tabs	100 mg single dose, repeat after 2 weeks	100 mg single dose, repeat after 2 weeks
Hookworm	100 mg tabs	1 tab twice daily for 3 days	1 tab twice daily for 3 days
Round worm	Mebendazole 100 mg tabs Or Albendazole	1 tab twice daily for 3 days	1 tab twice daily for 3 days
		400 mg single dose	
Whip worm	Mebendazole 100 mg tabs	1 tab twice daily for 3 days	1 tab twice daily for 3 days

Tapeworm	Niclosamide 500 mg	2 gram, 1 gram before breakfast, 1 gram 1 hour after breakfast	> 6 yrs: 1 g before & 1 g after breakfast 2-6 yrs: 500mg before and 500 mg after breakfast < 2yrs: 250 mg before and 250 mg after breakfast.
	Or: Albendazole 400 mg tabs	Once a day for 3 days	

PREVENTION:

- Improved water and sanitation
- Health education
- In places endemic for hookworm wear shoes
- In endemic areas mass drug campaigns recommended

8. LIVER DISEASES

8.1. HEPATITIS

Hepatitis causes yellowing of the eyes within 1 week after the onset with malaria-like symptoms.

Management:

- Always exclude malaria. The malaria parasite can break down the red blood cells and so cause jaundice and anaemia. If it is not malaria and the patient is not very ill, then jaundice is often caused by the Hepatitis virus. Advise the patient to rest, take enough fluids and good foods.
- Don't give any drugs as this may make the disease worse (the liver is infected).

Prevention:

Hepatitis can be prevented by drinking safe or boiled water, good hygiene and use of latrines

8.2. AMOEBIC LIVER ABSCESS

Can be confirmed with ultrasound

Management:

- Metronidazole for 10 days
- in case of threatening rupture refer for aspiration, preferably under guidance of ultrasound

8.3. ASCITES

This can be caused by

- Systemic disease: heart failure, renal failure
- Intra abdominal causes: malignancies or TB peritonitis
- Chronic liver failure

Chronic liver failure can be caused by cirrhosis due to alcoholism, chronic hepatitis or chronic schistosomiasis.

Management:

- Identify and treat any underlying causes
- If due to chronic liver failure:
- Restrict salt and fluid intake
- If patient not stable add: Spironolactone once daily
- If there is no relief add:Furosemide
- If Furosemide is given on a long term basis Potassium should be added to prevent hypokalaemia
- Consider abdominal tapping and drainage in severe/chronic cases (only if a sterile procedure can be ensured)

Drug	HF	dose	Frequency	Duration
Spironolactone 25mg tablet	<u>H</u>	100 -400 mg	Once daily	review
Furosemide 40mg tablet	<u>H</u>	Start at 40 mg	Once daily	review
Potassium chloride 600 mg tabs	<u>H</u>	600 mg	Twice daily	Only with high doses of Furosemide

9. PERITONITIS

Peritonitis can be localized or generalized. It can have many causes: appendicitis, severe PID, perforations etc. Often it needs surgical intervention.

Clinical features:

- Mostly acute onset
- Nausea and vomiting
- Severe tenderness both on pressure and release of pressure, commonly called 'rebound tenderness'
- On auscultation silent abdomen (no bowel sounds)
- No stool or flatus
- Fever

Management:

- Do not give food or water
- Put up IV line and correct dehydration
- Refer to a hospital urgently

19. INJURIES AND TRAUMA

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INJURIES AND TRAUMA

1. FRACTURES

A fracture is a complete or incomplete break in a bone. It can be caused by:

- trauma (most common)
- osteoporosis in the elderly
- tuberculosis or other infections
- fragile bone disease (rare)
- cancer

CLINICAL FEATURES:

- pain
- swelling
- inability to use / move the affected part
- deformity
- The fracture can be open (with a wound) or closed. An open wound is more dangerous and needs urgent attention within hours

Treatment:

- elevate the fractured limb
- Immobilize the fractured part with a splint. With fracture of the neck or back try to mobilize the patient as little as possible. If you have to lift him/her do it with several persons
- Give an analgesic such as Tramadol for severe pain
- In any open wound, remove dead tissue, stop the bleeding, clean and dress the wound. Give Tetanus prophylaxis if needed
- Check for other injuries and attend to them as above
- Refer to a hospital

2. WOUNDS

A wound is defined as any break in the continuity of the skin or mucosa

Management:

Minor wounds:

- First wash thoroughly with water and soap
- Clean with Chlorhexidine 0.3% + Cetrimide 3% solution or Povidone Iodine 10 %
- Tetanus prophylaxis if needed

Deep and /or extensive wounds

- Clean with Chlorhexidine 0.3%+Cetrimide 3% solution or Povidone Iodine 10%
- Tetanus prophylaxis if needed
- Explore the wound
- Debride the wound if needed
- If clean and fresh <8 hours, suture under local anaesthesia with Lignocaine hydrochloride 1%

Do not suture gun shot and bite wounds!
--

If the wound is > 8 hours old or dirty:

- After cleaning, exploration and excision apply a simple dressing
- Daily cleaning and dressing
- If there are no signs of infections after 72 hours the wound may be sutured after refreshing the tissue

If the wound is very dirty and does not clean up it will have to heal on its own or in the end may need a skin graft.

3. BITES

Bites of humans or animals can create very infected wounds, because mouth's and beaks are full of bacteria.

Treatment:

- Clean the wound thoroughly immediately with soap and water
- Stop excessive bleeding
- Allow the wound to dry
- Apply Povidone Iodine solution 10%
- Give antibiotics only to infected wounds, deep wounds or wounds > 8 hours old
- Give painkillers if needed
- **Do not suture**
- Give Tetanus Toxoid if needed
- In case of suspected rabies See chapter ...:

4. TETANUS PROTOCOL

1. Fully immunized people who had a booster within the last 10 years do not need **any** anti Tetanus treatment, in whatever form.
2. Fully immunized people but last booster > 10 years ago:
Give 1 booster dose of TT 0.5 ml deep SC or IM.
3. Un-immunized or partially immunized people: Give three doses of TT 0.5 ml deep SC or IM at monthly intervals.

Passive immunization: In a very contaminated wound in an un-immunized person give TIG (Tetanus Immunoglobulin Human) IM:

- o < 5 years: 75 IU
- o 5-10 years: 125 IU
- o > 10 yrs and adults: 250 IU

5. SNAKEBITE

In general there are three sorts of snakebites, depending on the area:

- Snakebites from non poisonous snakes
- snakebites that cause extensive local lesions (pain, swelling, necrosis and at times bleeding disorders)
- Snakebites that cause neurological problems, with paralysis of the respiratory muscles leading to coma and death

FIRST AID:

- Calm the patient and lie him/her down
- If venom has been spat into the eye wash liberally with water, then apply Tetracycline eye ointment
- In case of a bite, clean the wound and remove fangs if they are still present
- To cut and suck the wound may be useful but only in the first 20 minutes
- Apply a crepe bandage from the wound upwards (**not a tourniquet**) and immobilize the limb as much as possible
- Refer to a place / health facility where anti-venom is available (antivenom sera polyvalent (E&C Africa)

HOSPITAL:

- Admit for 24 hours
- **Administer anti-venom ONLY** if there are real signs of toxicity:
 - Signs of systemic poisoning
 - Marked swelling of the limb, chest or head
 - Associated bleeding disorder

6. INSECT BITES AND STINGS

SCORPION

Most scorpions are small, their stings are very painful but not life threatening, Reassurance and painkillers are often enough. Admit small children or cases of anaphylactic shock. For treatment of anaphylactic shock see page...

BEEES, WASPS, HORNETS, SPIDERS AND ANTS

Most of these stings are only mildly venomous

Treatment:

- Clean the wound
- Remove stings if they are still present
- If severe local reaction occurs (swelling and itching) then administer Chlorphenamine
- In anaphylactic shock treat as on page ????

7. BURNS

Burns are tissue injuries caused by thermal, chemical, electrical or radiation energy.

Severity of the burns depends on the following criteria:

I. The depth of the burn:

- Superficial / partial thickness: the wound is still sensitive all over
- Deep / full thickness: there is sensation at the edges only

II. The % of the total body surface area (TBSA) burnt:

In adults this can be quite easily calculated with the rule of nines, many body parts represent either 9 or 18 % of the body surface. In children proportions are slightly different:

See table below:

Calculation of BSA

Part of body burnt	Age < 2 yrs %TBSA	Age >2 yrs %TBSA
Entire head	18	9
Upper limb (each)	9	9
Trunk (each side)	18	18
Lower limb (each)	14	18
Perineum	1	1

III general condition of the patient:

In general children and the elderly are more vulnerable and they need more care.

GENERAL MANAGEMENT GUIDELINES:

Any burn greater than 10 % of the body surface area is considered extensive and serious because of fluid loss, energy loss, anemia and risk of infection.

Transfer the following cases to the hospital:

- Adults with 10% burns or more
- Children with 8-10 % burns or more
- Burns of special regions: face, neck, hands and feet and perineum
- Circumferential burns (right around a limb)
- Electrical, lightning and chemical burns
- Lesser burns with other trauma's (inhalation, etc)

Before transferring (especially. if the hospital is far), stabilize the patient and give pain killers. Send patient with medical attendant and keep patient warm.

Management of moderate burns:

Superficial burns are the most painful

- Give painkillers
- Clean with Iodine and dress with dry or non-adherent dressing
- Do not puncture blisters
- Elevate the burned part (e.g. arm in an arm sling, leg on a pillow)
- Follow up as outpatient
- For a clean wound antibiotics are not needed, if there are signs of infection give Amoxicillin
- If the wound is over a joint encourage early exercise to prevent contractures

Management of severe burns especially large areas

This is very intensive multifactorial treatment:

Resuscitation:

- Establish an IV line
- Start Ringers lactate
- Give analgesia IV, Pethidine / Morphine
- In very large burns empty the stomach with an NG tube, after stabilization you can use this tube for feeding
- Give Tetanus Toxoid IM
- Antibiotics are only needed when the wounds are infected
- Record input-output
- Ensure adequate urine output, if not increase fluids
- Regular temperature, if patient develops fever consider antibiotics

Fluids required in the first 24 hours

Adults:

Total amount (ml) = 4 x weight in kg x area of burn % (but not more than 45 %)

- Infuse Ringers Lactate or normal saline:
- Infuse half of the total amount in the first 8 hours, then a quarter in the second 8 hours then quarter in the third 8 hours.

e.g. a woman of 50 kg with 30% burns needs $4 \times 50 \times 30 = 6000\text{ml}$

- 3 litres in the first 8 hours

-1500 ml in the second 8 hours

-1500 ml in the third 8 hours

Children:

- Give Ringers:
- 20 ml/kg over the first 2 hours
- Then calculate: Total amount (ml) = 3.5 x weight x area of the burn % (but not more than 35%)
- Give 1/3 of the total amount every 3 hours +
- Darrows Half strength with Dextrose 2.5% normal daily requirement

e.g. a child of 10 kg with 20% burns needs $3.5 \times 10 \times 20 = 700\text{ ml}$

- 200 ml in the first 2 hours

- then 230 ml Ringers each 8 hours +

- NDR: $10 \times 100 = 1000\text{ml}$ half Darrows/Dextrose in 24 hours *Normal daily requirement*

Management of burns:

- If a clean room (preferably isolated or a burn unit) is available the best is to let the patient sleep under a bed net and leave the wounds open

- In a crowded ward it is better to dress them completely
- Preferably clean the wounds in a shower or (clean) sit bath
- It is sufficient to clean the wounds once a day
- Apply Silver Sulfadiazine cream
- If there is any sign of infection
- Clean more often and soak for longer periods
- Only if there is infection start on Ampicillin IV
- If no result add Gentamicin IV

Nutrition:

- Give high protein, high energy diet; these patients need an enormous amount of proteins and calories, otherwise they may die of exhaustion
- Give extra Ferrous Sulphate (Iron), Folic acid and Multivitamins
- Check Hb regularly

Physiotherapy:

- If burns are located over joints always splint them in the stretched position to prevent contracture
- Start physiotherapy early
- In deep wounds skin grafts may be needed

It is much easier to prevent contractures than to treat them
--

8. HEAD INJURY

Any head injury accompanied by loss of consciousness and/or loss of memory should be considered potentially serious and be admitted for at least 24 hours.

Management

- Admit
- Hourly observations if:
 - conscious level is depressed on admission
 - a skull fracture is present
 - there are focal neurological signs
- Observations include:
 - Glasgow Coma scale
 - Blood pressure, pulse rate and respiratory rate
 - Pupil size and reaction

Glasgow coma score

Eye opening (E)		Best motor response (M)	
• Spontaneous	4	• obeys	6
• To voice	3	• localize pain	5
• To pain	2	• flexion withdrawal	4
• Nil	1	• flexion abnormal	3
		• extension	2
		• nil	1
Best verbal response (V)			
• oriented, converses	5		
• converses but confused	4		
• inappropriate words	3		
• incomprehensible sounds	2		
• nil	1		

Score = E+M+V (the higher the score the better the prognosis)

- If the observations are deteriorating surgical intervention may be needed
- In case of an open skull fracture clean and debride the wound thoroughly.
- Administer Ampicillin and Chloramphenicol IV for 1 week then oral for 1 week
- If the skull is very depressed it may need elevation in theatre
- In case of a basal skull fracture: spinal fluid / blood comes out of ear or nose
 - Rest and antibiotics for two weeks
 - Do not give sedatives, use Paracetamol
- In case of convulsion give Diazepam 10-20 mg IV
- If more than one convulsion start the patient on Phenobarbitone IM daily

Drug	HF	Dose	Frequency	Duration
Ampicillin IV	<u>H</u>		Four times daily	7 days
Chloramphenicol IV	<u>H</u>	500mg	Four times daily	7 days
Amoxicillin 500mg caps		500 mg	Three times daily	7 days
Chloramphenicol 500mg caps		500 mg	4 times daily	7 days
Diazepam IV 5mg/ml inj	<u>C/H</u>	10-20 mg	Single dose	If needed
Phenobarbitone IM	<u>H</u>	5mg/kg	daily	As long as required

9. MULTIPLE INJURIES

For resuscitation A B C D E F are important, in this order:

- | | |
|-------------------------------|--|
| A. Airway: | Make sure the airway is free: position the head to the side and remove mucus, blood, foreign bodies, etc. |
| B. Breathing: | Check respiratory rate and air entry. |
| C. Circulation: | Stop active bleeding. Insert stable IV line. Monitor pulse and BP regularly. |
| D. Dysfunction of CNS: | Check consciousness, neurological problems (loss of function, memory loss, spinal cord status, any paralysis etc. |
| E. Exposure: | Carry out a complete physical examination, but make sure to cover the patient properly afterwards to keep him warm. |
| F. Fractures: | Try to stabilize peripheral fractures. Move a patient with suspected neck and spine fractures as little as possible. |

Transport to a hospital as soon as possible.

20. OTHER INFECTIOUS DISEASES

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OTHER INFECTIOUS DISEASES

BRUCELLOSIS

Brucellosis is endemic in goats and cattle in Southern Sudan. Prevalence in animals varies but seems on average 10%, higher in animals which have aborted or have joint swelling.

Brucellosis in humans is caused by drinking un-boiled milk. Other ways of transmission include sexual contact, blood transfusions, wounds, breastfeeding and the traditional Nuer habit to blow into a cow's vagina to stimulate milk production. Mother to child transmission is possible during pregnancy when the mother is infected.

CLINICAL FEATURES:

Incubation time is about 2-4 weeks. The clinical picture is often non-specific. Brucellosis may affect many organs / parts of the body, and may present with vague complaints. This makes it difficult to diagnose.

Initial illness is:

- non specific with fevers, lethargy, anorexia and night sweats
- enlargement of liver + spleen can be present in up to 27 % of cases
- lymph node enlargement can be present

Later stage:

- Bone + joint involvement is common (normally the weight bearing joints as knee and hips). Pain is severe and patient might not be able to walk. Sacroiliitis (inflammation of the sacroiliac joint) is also common
- Rarely are there neurological signs, sometimes suggestive of disseminated sclerosis. Neuro-brucellosis can manifest itself as meningo-encephalitis (inflammation of the brain and the meninges) with fatigue, de-myelinating neuropathy and spastic paraplegia

CASE DEFINITION OF BRUCELLOSIS IN SSUDAN:

- Temperature of $>38^{\circ}\text{C}$ on two occasions a week apart
- Clinical assessment reveals no other explanation for fever
- Negative results of other investigations (eg Malaria, TB, KA)
- +/- Musculoskeletal symptoms, particularly sacroiliac, hip, spine symptoms or objective findings with evidence of resulting functional disability

Diagnosis:

Current new Brucellosis IgG + IgM dipstick has proven high sensitivity + high specificity

Treatment:

Standard treatment regimen in Southern Sudan is Doxycycline (Cotrimoxazole for < 8 years, pregnant and lactating women) for 6 weeks plus Gentamicin for 2 weeks. This regimen is expected, to be highly effective unless drug resistance develops.

**Note: the first two weeks the patient takes both
Gentamicin and oral drugs**

Treatment regime

- ❖ Over 8 years old: Combination treatment of Gentamicin (2 weeks, 14 injections) and Doxycycline (tabs for 6 weeks)
- ❖ Under 8 years old, pregnant and lactating mothers: Combination treatment Gentamicin (2 weeks, 14 injections) and Cotrimoxazole (tabs for 6 weeks)

Dosage Gentamicin (5 mg / kg): based on vials of 80 mg/2ml

Weight of Patient	Dose in mg	Qty in of ml of Gentamicin
8 - 12 kg	60mg	1.5
13 - 16 kg	80mg	2.0
17 - 20 kg	100mg	2.5
21 - 24 kg	120mg	3.0
25 - 28 kg	140mg	3.5
29 - 32 kg	160mg	4.0
33 - 36 kg	180mg	4.5
37 - 40 kg	200mg	5.0
41 - 44 kg	220mg	5.5
45 - 48 kg	240mg	6.0
49 - 52 kg	260mg	6.5
53 - 56 kg	280mg	7.0
57 - 60 kg	300mg	7.5
> 60 kg	320mg	8.0

Remarks:

- Gentamicin is given as a daily injection for two weeks
- If the dose is not administered on Sunday (due to closure of the clinic), ensure that the patients receive 14 injections in total
- Advise the patient to drink plenty of water

Dosage Doxycycline:

Weight of Patient	Dose of Doxycycline
20 - 29 kg	100 mg daily
30 - 39 kg	150mg daily
>40 kg	200mg daily

Remarks:

- Doxycycline is NOT allowed for pregnant and lactating women and children less than 8 years old
- Patients are given a daily dose of Doxycycline during their injection therapy plus four weeks afterwards

Dosage Cotrimoxazole:

Weight of Patient	Dose of Cotrimoxazole 480mg tablet	Frequency
8 - 11 kg	240mg	Twice daily
12 - 24 kg	480mg	Twice daily
25 kg – adult	960mg	Twice daily

Remarks:

- Cotrimoxazole for two weeks (receive this daily while on injections) + 2 weeks + 2 weeks (6 weeks in total)

7. Follow up:

- Patients to be reviewed at 4 and 6 weeks and findings recorded
- Patients presenting with recurrent symptoms after full treatment for brucellosis. It is not possible to diagnose or treat recurrent brucellosis, refer for further investigations.

TYPHOID FEVER

Typhoid fever is a bacterial Infection caused by Salmonella typhi. It is mainly transmitted by faecal-oral route, especially contaminated food and water. Case fatality is high without proper treatment, about 10-20%.

Clinical signs / symptoms

Clinical diagnosis is difficult

- Sustained fever (for more than a week)
- Headache, insomnia, loss of appetite, epistaxis (bleeding from the nose)
- Abdominal pain, diarrhoea or constipation
- Toxic, confusion
- Moderate splenomegaly (enlargement of the spleen)
- Relatively slow pulse (compared to the fever)

Confirmed case

- Relative leukopenia with a normal white blood count is quite typical
- Widal test is not very reliable

INCUBATION

Incubation period is usually 8–14 days but may be from 3 days up to 1 month. Patients remain infectious for two or more weeks, some can become chronic carriers.

CASE MANAGEMENT

- Antibiotics
- First choice: Chloramphenicol for 10 days
- Second choice Ciprofloxacin for 7 days
- Re-hydration with ORS or in severe cases administer IV re-hydration

PREVENTION

- Proper water and sanitation and health education
- Boiling of milk and milk products
- Inform the health authorities when one or more suspected cases are identified

Drug	HF	Dose	Frequency	Duration
Chloramphenicol 250mg caps	<u>C/H</u>	Adults: 750 mg Children > 2 months: 25 mg /kg/dose	4 times daily	10 days
Ciprofloxacin	<u>C/H</u>	Adults: 500 mg Children: 10-15 mg /dose	2 times daily	5-7 days
Paracetamol			when required	

RABIES

An infectious disease caused by the rabies virus and transmitted by close contact with an infected animal/person (usually a scratch or bite). Without early intervention it usually ends in death through respiratory paralysis

Clinical signs / symptoms:

- History of a bite or scratch from a suspected animal
High risk animals are dogs, bats, cats, foxes: in Sudan 90 % of the cases are caused by dogs
- Incubation time is usually 3 -12 weeks but can be shorter or longer
- Prodromal phase: 2-4 days: non specific infection: pain and paresthesia around the bite
- Acute phase: Hyper excitability, agitation, painful laryngeal spasms and hydrophobia (fear of water), ascending paralysis
- Progress to coma and death in 7-10 days

Diagnosis

- Diagnosis in Sudan is almost always clinically. The final diagnosis can be obtained in clinical specimens either from the animal or the patient with advanced methods
- If possible catch and observe the animal. if it dies within a few days this is very suggestive for the diagnosis

Management:

- Immediately wash the wound or scratch with soap and water, rinse and apply 10 % Povidone Iodine
- Excise necrotic tissue and do NOT suture
- Give antibiotics Ampicillin / Amoxicillin) see chapter on trauma
- Give Tetanus prophylaxis
- Give Rabies vaccine according to the table below:
- Notify the appropriate medical and veterinary services

Guide for post-exposure treatment

Category	Type of contact	Treatment
I	Contact with animals Licks on intact skin	None, if history is reliable
II	Minor scratches / abrasions without bleeding Licks on broken skin	Administer Rabies vaccine immediately If the animal stays healthy for 10 days you can stop the vaccination
III	Major exposure Bite /scratches through the skin Contamination of mucous membranes with the animals saliva	Administer Rabies Immunoglobulin AND vaccine immediately Stop vaccination if animal stays healthy for 10 days

VACCINATION

- General vaccination of children in Sudan is not yet recommended
- Post exposure vaccine must be administered in the upper arm (deltoid muscle)
- Follow the 2-1-1 IM regime
 - ❖ Day 0: 0.5 ml IM in right arm, 0.5 ml IM in left arm
 - ❖ Day 7: one dose
 - ❖ Day 21 : one dose

PASSIVE VACCINATION

In category III contact give human rabies immunoglobulin 20 IU/kg

- ❖ Infiltrate half the dose in and around the wound
- ❖ Give the other half IM in another location than that used for the vaccination

Prevention:

- Vaccinate domestic animals (cats, dogs) against rabies
- Don't let children play with unfamiliar animals
- The county veterinary dept should regularly shoot stray animals

SCHISTOSOMIASIS (BILHARZIA)

The schistosome's are blood fluke worms. S.haematobium causes urinary schistosomiasis, S. mansoni causes the intestinal form. It is a water-based disease: Penetration of human skin by larval worms (cercariae) develop into snails. The snails are infected by eggs discharged in urine (S. haematobium) or faeces (S. mansoni) into fresh water by patients with chronic schistosomiasis.

DIAGNOSIS OF URINARY SCHISTOSOMIASIS

- Visible (terminal) haematuria
- S. haematobium eggs in urine (microscopy)
- Complications:
 - Hydronephrosis
 - Pyonephrosis
 - Hypertension
 - Cancer of the bladder
 - Infertility

DIAGNOSIS OF INTESTINAL SCHISTOSOMIASIS

- Nonspecific abdominal symptoms
- Blood in stool
- Hepato(spleno)megaly
- S. mansoni eggs in stools (microscopy)
- Complications:
 - Portal hypertension
 - Splenomegaly
 - Ascites
 - Oesophageal varices
 - Anaemia

Treatment

- Praziquantel is the drug of choice against all schistosome parasites. A single oral dose of 40 mg/kg is generally sufficient to produce cure rates of 80–90% and dramatic reductions in the average number of eggs excreted.
E.g. Praziquantel treatment for 1 person of about 45 kg requires tablets of 600 mg in 1 single dose
- For complications refer to a hospital

Prevention

The type and intervals of intervention depend on prevalence.

- ❖ Intervention in schools (enrolled and non-enrolled children): Targeted treatment of school-age children, once a year
- ❖ Health services and community-based intervention: Access to Praziquantel for passive case treatment
- ❖ Safe water and sanitation, health education
- ❖ Reduction of snail habitat and snail contact (in irrigation and agriculture practices); environmental management

YELLOW FEVER

Yellow fever is caused by an arbovirus (arthropod-borne virus), transmitted by mosquitoes. Incubation is 3–6 days and patient's blood is most infectious just before and during first 5 days of illness.

Clinical description:

There are two disease phases for yellow fever:

1. Acute phase:

- May be asymptomatic
- Normally characterized by fever and shivering
- Muscle pain (with prominent backache) and headache
- Loss of appetite, nausea and/or vomiting
- Often, the high fever is paradoxically associated with a slow pulse). Most patients improve after 3–4 days and their symptoms disappear, but 15% enter the toxic phase

2. Toxic phase:

- Fever reappears
- Rapid development of jaundice
- Abdominal pain with vomiting
- Bleeding can occur from mouth, nose, eyes and/or stomach

- Kidney function deteriorates; this can range from albuminuria to complete renal failure with no urine production (anuria)
- Half the patients in the toxic phase die within 10–14 days. The remainder recovers without significant organ damage

Laboratory tests

Needs advanced tests

Management:

- One confirmed case must lead to alert, inform CHD and other relevant authorities immediately
- International technical assistance and massive vaccination campaigns have to be organized promptly
- No specific treatment for yellow fever is available
- Correct dehydration and fever with ORS and Paracetamol
- Intensive supportive care may improve the outcome but is rarely available
- Preventive measures:
 - o Vaccination
 - o Bed nets
 - o Spraying
 - o Eliminate potential breeding sites for mosquitoes
 - o Ideally yellow fever vaccination should be integrated in routine EPI activities

EBOLA HEMORRHAGIC FEVER

Ebola hemorrhagic fever is a very lethal infection caused by the Ebola virus. Mode of transmission is person-to-person by direct contact (droplets) or indirectly by infected blood, secretions, organs, semen and fomites. Incubation time is 2 – 21 days.

Symptoms:

- Initially nonspecific
- Acute fever, diarrhoea that can be bloody and vomiting
- Headache, nausea, dysphagia and abdominal pain
- Conjunctival injection
- Hemorrhagic symptoms (nosebleeds, bleeding gums, vomiting of blood, blood in stools, purpura)
- Some patients may show a maculopapular rash on the trunk
- Dehydration and wasting occur as the disease progresses
- In the end often involvement of the central nervous system occurs, manifested by somnolence, delirium or coma

The case-fatality rate ranges from 50% to 90%

Laboratory tests:

Needs advanced tests

Suspected cases:

- Any person having had contact with a clinical case and presenting with acute fever
- Any person presenting with acute fever and three of the following symptoms: headache, vomiting/nausea, loss of appetite, diarrhoea, intense fatigue, abdominal pain, general or articular pain, difficulty in swallowing, difficulty in breathing and hiccups
- Any unexplained death
- Contact (in epidemic situation): An asymptomatic person having had physical contact within the past 21 days with a confirmed or probable case or his/her body fluids (e.g. care for patient, participation in a burial ceremony, handling of potentially infected laboratory specimens). Risk is highest during the late stages of illness. Risk during the incubation period is low

Management:

- One suspect case must lead to an alert: inform CHD and other relevant authorities immediately
- Prompt isolation of a suspect case
 - Isolation of patients
 - Restriction of access to patients wards
 - Use of protective clothing
 - Safe disposal of waste + patient clothes
 - Disinfection of all non-disposable supplies and equipment
- There is no specific treatment
- Give analgesics
- Re-hydrate orally if possible
- Antibiotics and antimalarials if needed
- Sensitize the community and educate all staff about:
 - Risk and way of infection
 - Isolation practices
 - Safe burial
 - Limit movements in community
 - Do not consume dead animal meat found in the forest

LYMPHATIC FILARIASIS

Hydrocele or lymphoedema is caused by Wuchereria bancrofti, a filarial worm in endemic areas. It is transmitted by female mosquitoes. Incubation time is one month to one year or more.

Laboratory criteria for diagnosis:

Positive parasite identification by:

- direct blood examination or
- ultrasound or
- more advanced tests

Clinical picture:

- Recurrent attacks of "filarial fever" (pain and inflammation of lymph nodes and ducts)
- Often accompanied by fever, nausea and vomiting
- Long term (5 to 20 years illness) manifestations may include:
 - ❖ elephantiasis (massive swelling of limbs)
 - ❖ hydrocele (swelling of the scrotum in males)
 - ❖ enlarged breasts in females
 - ❖ chyluria (+ lymph fluid in urine)

Management:

General

Hygiene for affected body parts by washing them twice daily with soap and water. Keep nails short and clean.

- Wear comfortable footwear
- Raise the limb at night
- Exercise or massage to promote lymph flow
- Treat small wounds early
- If needed early antibiotics or antifungal agents

Medical:

Diethylcarbamazine (DEC) 6 mg/kg daily for 12 days.

For children below 10 years give half the dose. It is best to divide the doses over 24 hours.

In mass treatment campaigns a single dose once a year is used of 6 mg/kg.

Alternatively, Ivermectin and Albendazole can be used in endemic areas.

Prevention:

- In areas known to be endemic, mass drug administration (MDA) is implemented
- Vector control: See other chapters (malaria, etc) about mosquito control

TETANUS

Tetanus is caused by a bacteria called Clostridium tetani and characterized by intermittent spasms of voluntary muscles

Tetanus spores can enter the body:

- *through deep penetrating skin wounds*
- *the umbilical cord of the newborn*
- *ear infection*
- *wounds during delivery*
- *septic abortions*

Clinical features

- stiff jaw (trismus)
- generalized spasms, induced by sounds or strong light (showing a characteristic grimace)
- arching of the back with the patient clearly conscious

General Management:

- Intensive nursing in a quiet, slightly dark, isolated area
- Make sure the bed is soft and comfortable
- Turn the patient gently every 3 hours
- Observe airway, spasms and fever closely
- NG tube for nutrition, hydration and medication
- In babies give expressed breast milk
- Remove mucus gently (extraction, suction)
- Minimise handling of the patient
- Avoid intramuscular injections
- Clean and debride necrotic wounds after sedating the patient

Medical management:

- Benzyl Penicillin 6 hourly for 10 days
- Give injections slowly into the IV line to minimize pain
- Diazepam: Dose and frequency of administration must be adapted to the patient's condition. The objective is to find a level that suppresses muscle spasms without depressing respiration
- Tetanus immunoglobulin human (TIG) IM in two different sites
- First give a small test dose to exclude allergic reactions
- Keep intubation and ventilation equipment at hand
- If patient survives give full immunization

Drug	F	Dose	Frequency	Duration
Benzyl Penicillin IV	H	Adult: 2 MU Child: 50.000 U-100.000 U Neonate: 100.000 U	4 times daily 4 times daily 2 times daily	10 days change to oral Amoxicillin when possible
Diazepam IV	H	0.1-0.3 mg /kg	Every 1-4 hours, depending on condition of the patient	Taper down slowly when condition allows
Tetanus immunoglobulin (human) IM	H	Children/adults: 3000 IU in two different sites Neonates: 1500 to be injected in two different sites	once	
Anti tetanus serum (only if ITG is not available) IV	H	Adults: 10.000 IU Neonates: 1500 IU (Give small test dose first	once	

21. POISONING

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POISONING

Poisons can include drugs, plants, traditional medicine, chemicals used in agriculture or for other purposes. Poisoning by snake or insect is treated in chapter 19.

Advice on prevention is given in the preventive chapters.

GENERAL TREATMENT MEASURES:

In many cases there is no specific antidote, but general measures can minimize the effect:

- Remove patient from further exposure. Remove contaminated clothing and wash contaminated skin with soap and large amounts of water
- Maintain respiration and ventilate if necessary
- Keep the patient warm, maintain blood pressure, lie patient down with feet up
- Give IV fluids if needed (saline 0.9%)
- Monitor fluid intake and output
- Induced vomiting or gastric lavage only help within 4 hours (8 hours for salicylates and tricyclic antidepressants) Cautions:
 - ❖ Do not induce vomiting if the patient is drowsy or unconscious, food may enter the lungs
 - ❖ Do not induce vomiting for a corrosive substance or a petroleum product

GASTRIC LAVAGE

- Put an NG tube with a wide bore
- Adults: 300 ml tap water for each washing till the water is clean
Children over 2 years: Reduce the amount of water used for each washing
Children < 2 years: wash with ½ strength Darrows / Dextrose 2.5% 100 ml per washing (never use water or Saline)
- After the washing is complete leave activated charcoal:
 - o Adults: 50g added to 400 ml water (mix well)
 - o Children: 1g/kg in an appropriate amount of water (mix well)
- Lastly you can give a laxative to speed up removal of the toxic substances

Corrosive substances: (e.g. battery acid, laundry powders, strong hypochlorite, JIK, or ammonia, carbolic acid, phenols etc.)

- Immediately dilute by giving fluids (milk or water)
- Do not induce vomiting as further damage may occur
- Refer to a hospital as major damage to the oesophagus needs immediate intervention

Eye contamination

See eye diseases

Counseling / Prevention:

Make sure that before the patient is discharged, the underlying cause of the poisoning is established and known, adequate counseling is provided, for example:

- In case of an accident educate the parents gently about preventive measures (they will already feel guilty, so be friendly)
- In case of a suicide attempt get a social history, history of depression and you may want to involve relatives (See chapter on psychiatry)
- In case of deliberate adding methanol during brewing you will have to report to the authorities concerned

SPECIFIC POISONS:

1. Acetylsalicylic acid (Aspirin)

Toxic dose: 0.2-0.5 g/kg

Management:

- General measures as above
- Induce emesis
- Give activated charcoal
- Oxygen / ventilate if necessary
- Check blood glucose, if low, give Dextrose 50%
- If there is adequate urine output give milk orally every hour
- In severe poisoning start Dextrose 5% as soon as possible
- If there is fluid retention give Furosemide IV

2. Carbon Monoxide Poisoning

Occurs when burning (char)coal in an unventilated confined space. Signs / symptoms are headache, weakness, dizziness, tachycardia and dyspnoea. Some neurological symptoms may be permanent.

Management:

- Remove patient from exposure
- Administer Oxygen and if needed provide ventilation for several hours
- Maintain blood pressure
- If the temperature is high cool the skin
- If there is cerebral oedema give Furosemide and Hydrocortisone IV 4 hourly
- Control convulsions with Diazepam

3. Chloroquine

Toxic dose: >2 gram Signs /symptoms are drowsiness dizziness, dyspnoea, low blood pressure, cardiac irregularities, respiratory arrest and convulsions. (Sometimes Chloroquine is taken to cause abortion)

Management:

- NG-Tube and gastric lavage as soon as possible
- IV fluids and ventilation if needed
- Diazepam IV for convulsions

4. Paracetamol

Toxic dose: 10-15 gram, this is 20 tablets or more. Causes liver damage but this may only become evident after 3-4 days.

Management:

- Gastric lavage with activated Charcoal
- Keep patient warm and quiet. Observe for 4 days
- Give Dextrose 5% for 48 hours

5. Opiates (Codeine, Morphine, Pethidine)

For newborns with respiratory depression after the mother has had an opiate
See chapter on neonatology.

For adults with respiratory depression after an overdose give Naloxone.

Drug	F	Dose	Frequency	Duration
Naloxone	H	0.01 mg/kg	Repeat if needed	

6. Alcohol

Signs / symptoms are smell of alcohol, excessive sweating, dilated pupils, coma, low blood pressure and low temperature. (Ensure that these signs and symptoms are not confused with a diabetic coma)

Management:

- Maintain airway, maintain body temperature
 - Lie the patient on their side and prevent aspiration
 - Check blood glucose, if needed give Dextrose 50% and continue with Dextrose 5%
 - Give oral glucose as soon as patient wakes up
 - Avoid excessive fluids
 - In acute alcoholic mania give Diazepam slowly IV
- **For chronic alcohol use See chapter on psychiatry***

7.Methanol

Signs /symptoms are the same as in alcohol but usually start later. It can cause severe acidosis and retinal / optic nerve damage (blindness).

Management:

- Oral Sodium Bicarbonate solution 5 %
- In severe cases Sodium Bicarbonate 8.4 % 50 ml IV
- Give 30 ml of alcohol 40% (waragi, whisky) every 3 hours until patient improves (this delays the oxidation of methanol to toxic metabolites)
- Keep the patient warm
- Protect eyes from strong light

8. Paraffin, petrol, and other petroleum products (including paint thinner, etc.)

These can lead to aspiration pneumonia if they enter the lungs

Management:

- Do not induce vomiting, do not conduct gastric lavage
- If pneumonia / pulmonary oedema occurs, treat accordingly

9. Insecticides

Poisoning can happen through ingestion, inhalation or absorption through the skin

Management:

- Consider the solvent of the insecticide
- If it is paraffin or a petroleum product (as above) do not induce vomiting
- Give activated Charcoal
- Rest of the treatment depends on the type of insecticide, always ask to see the package / container and read the contents

10. Organo-Chlorine insecticides

Common names: Aldrin, Bexadust, BHC, chlordane, DDT, Dicofol, Dieldrin, Endosulfan, Gammabenzene, Hexachloride, Gammatox, Lindane and Toxaphene

Clinical features:

- CNS excitation
- Seizures
- Respiratory depression

Management:

- General measures
- Do NOT give milk, fats or oils, they increase absorption of the insecticide
- For convulsions, hyperactivity or tremors give Diazepam IV slowly

11. Organo-Phosphate and Carbamate insecticides

Common names of organo-Phosphates: Azodrin, Chlorfenvifphos, Diazinon, Dichlorvos, Dimethoate, Disulfoton, Fenitrothion, Malathion, Mevinphos, Monocotophos, Parathion, Pichloram, Rogor and Thiometon

Common names of Carbamates: Aldicarb, Carbaryl, Carbofuran, EPTC, Pirimicarb, Propxur, Zineb, Rat poison (black granules)

Clinical features:

- Increased secretions
- Constricted pupils (very small, often pinpoint)
- Muscle weakness
- Sweating
- CNS depression, including coma
- Confusion

Management:

- General measures
- Administer Atropine until signs of atropinisation appear. These are hot dry skin, dry mouth, widely dilated pupils, fast pulse
- When full atropinisation is reached, intervals between doses can be made longer but often high doses are needed for several days
- In severe cases dozens of ampoules may be needed
- Check and record pulse and pupils every 10 minutes in the beginning, keep checking for several days

12. Paraquat and related herbicides

Common names: Avenge, Chlormequat, Cycocel, Difenzoquat, Diquat, Gramoxone, Mepiquat, Morfamquat, Pix, Weedol

Clinical features:

- Multiple organ toxicity
- Pulmonary fibrosis
- Death can occur up to 3 weeks after the poisoning due to lung dysfunction

Management:

- Let the patient vomit
- Perform gastric lavage
- Monitor input –output, IV fluids if needed
- Delay the use of Oxygen as long as possible even if the patient gets dyspnoeic. Oxygen makes the Paraquat more toxic
- In severe cases especially if the patient is in shock/coma start steroids immediately

Drug	HF	Dose	Frequency	Duration
Hydrocortisone 100mg IV	C/H	200 mg	4 times daily	Start as soon as possible, continue till significant improvement is achieved

22. ANAEMIA

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ANAEMIA

INTRODUCTION

Causes for anaemia can be divided into five groups:

1. Lack of nutrition, particularly proteins, iron, vitamins like Folic acid and Vitamin B12. This can be due to lack of food or lack of absorption
2. A disease in which the bone marrow cannot make enough red cells, e.g. leukemia
3. Loss of blood, e.g. in accidents, nose bleeding, dysentery, circumcision, but also in hookworm or bilharzias. In women during/after childbirth
4. Breakdown of red cells, the most important cause in this group is malaria
5. Breakdown of cells because they are of a hereditary disease in which the cells are deformed

Diagnosis

- Severe paleness of palm, conjunctivae, nail beds, tongue
- Fatigue / weakness
- Breathlessness, rapid respirations, tachycardia, Chest pain
- (History of bleeding)
- Oedema, puffiness
- Enlarged liver
- Gallop rhythm heart
- Jaundice (if there is a breakdown of red blood cells)

Laboratory Confirmation

Confirmation can be done with Haemoglobin or Haematocrit

MILD AND MODERATE ANAEMIA:

General measures:

- Try to identify the cause, most common nutritional ,malaria or bleeding
- Give presumptive treatment for worms, Albendazole or Mebendazole
- Treat the underlying cause (malaria, bilharzias, hookworm)
- Health education

Feeding:

High energy and high protein diet.

Medication:

- Ferrous sulphate/Folic acid for 2-3 months
- Vitamin A (if last dose > 4 weeks ago) for children

Further management:

- Review monthly for three months
- Explain the cause and ways of prevention

SEVERE ANAEMIA: IN THE HOSPITAL

If the HB is below 4 gram/dl and the patient is getting into heart failure (oedema, liver enlargement, tachycardia and dyspnoea).

General measures:

- Admit urgently
- Prop up in bed
- Reduce fluid intake
- Take blood for Hb, malaria, blood group and cross matching
- Put up an IV line

Medication:

- Just before the transfusion give 1 dose of Furosemide IV (1mg/kg max 5mg)
- Give 15 ml/kg packed cells very slowly over 6 – 12 hours
- For small children use 100 ml packs

Further management:

- Before discharge find and treat the cause of the anaemia
- Give the child a bed net
- Explain how to prevent anaemia
- Give a supply of Ferrous and Folic acid for 1 month, then review. In total the patient needs at least 3 months of Ferrous and Folic acid

E.g. Blood transfusion in 8 hours

Weight child	Furosemide IV	Total amount of blood	Blood per hour
2kg	2mg	30ml	4ml
4kg	4mg	60ml	8ml
6kg	5mg	90ml	11ml
10kg	5mg	150ml	20ml
20kg	10mg	300ml	40ml
30kg	10mg	450ml	60ml

Only give blood if really needed!

Always make sure it is properly cross matched!

Always make sure it is checked for HIV, hepatitis, malaria!

Ferrous Sulphate 200 mg / Folic Acid 0.25 mg:

Age	Dose	<u>Frequency</u>
0-12 months	¼ tab	Once daily for 30 days
1 - 4 years	½x 1 x 30	Once daily for 30 days
5 - 10 years	1 x 2 x 30	Twice daily for 30 days
Over 10 years	1 x 2 x 30	Twice daily for 30 days

*Nutrition: Patients should be encouraged to increase intake of foods high in iron, Folic acid and Vitamin B12 such as lemons, mangoes, tomatoes and other fruit, dark green vegetables, whole-meal bread, beans, meat and liver.

SICKLE CELL ANAEMIA

Often the first presentation is pain and swelling in hands and feet in young children. This is caused by deformed red blood cells which can clot and cause small embolisms. The deformed cells also have a shorter lifespan and thus cause anaemia. The condition is inherited and more prevalent in certain tribes.

Clinical features:

- Painful swellings of hands and feet
- Pain in other body parts e.g. bone and abdomen
- Anaemia, jaundice
- Stunting of growth
- Bossing (distortion) of the skull
- History of other family members with the same condition
- Diagnosis can be confirmed with a sickling test
- Crises often precipitated by infection

Treatment:**In a sickle cell crisis:**

- Give Paracetamol for pain
- Treat underlying infections
- Plenty of fluids
- Transfuse if Hb is less than 5 g/dl (see under transfusion)

Long term:

- Folic acid 5 mg daily
- Do not give ferrous (the children will end up with iron intoxication)
- Life expectancy is reduced
- Counsel the parents about the possibility that future children can also be affected

23. METABOLIC / ENDOCRINE DISEASES

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METABOLIC / ENDOCRINE DISEASES

1. DIABETES MELLITUS

Diabetes mellitus is a metabolic disease where the body does not produce enough insulin to deal with the body's glucose metabolism.

Clinical features:

- Polydypsia: excessive thirst
- Polyuria: excessive urine production
- Tiredness
- Loss of weight
- (Genital) itching
- Poor sight
- Coma

Laboratory diagnosis:

- glucose present in urine
- elevated blood glucose levels

There are two types of diabetes:

1.1. Insulin dependant: often in young people / children with an acute onset.

1.2. Non insulin dependant: often in older people, often associated with overweight, slow onset. It can become insulin dependant in later stages.

1.1. INSULIN DEPENDANT DIABETES

This often starts at a young age with (sub) acute onset

ACUTE STAGE

Diagnosis:

- Patient often presents in a hyperglycaemic (pre) coma
- Dehydration
- Cachexia
- Sweet acetone smell on the breath
- History of severe thirst and polyuria
- Or history of diabetes and non compliance with medication or interfering infection
- Urine sugar 4+
- Blood sugar very high

General Management:

- Pass a naso-gastric tube to let the stomach drain freely
- Put up a secure IV line

- Infuse Sodium Chloride 0.9 % IV, for an adult as much as 8 litres may be needed in 24 hours, for children obviously less, also be cautious in the elderly
- Put an indwelling catheter if the patient is unconscious
- If the patient is a known diabetic look for underlying infection and get a history from the relatives
- Record fluid input output, blood pressure and pulse every two hours
- Monitor blood glucose hourly until it becomes 16 mmol/l then 2 hourly when changing to subcutaneous
- If more or less stable change to 4 hourly

Medical management:

- Start with Soluble Insulin 10 Units IM immediately, then 10 Units hourly IM until the blood sugar is below 16 mmol/l
- Then change to soluble insulin subcutaneous 4 hourly based on the sliding scale below
- Add Potassium Chloride IV 20 mmol/l to every litre after the first litre
- When patient is conscious replace with 600 mg Potassium oral twice a day for 7 days
- When blood sugar falls below 13 mmol/litre change to Dextrose 5%
- Put patient on a diet preferably by a nutritionist (see also below under non insulin dependant diabetes)
- Normal blood sugars should be between 3.5 and 10 mmol/l
- With this schedule patients should show improvement within 6-10 hours. But monitor closely
- When more or less stable refer to a higher level for starting of maintenance therapy. There are mixtures of short/middle and or long acting insulin, but it needs a doctor with experience to work this out. The patient then has to learn to inject him/herself once or twice a day subcutaneously

Treatment of hyperglycaemic coma

Note: the schedule is a guide, use your clinical judgment and be flexible

Fluids	litres	Time	Add Potassium Chloride IV To the saline	Soluble insulin	Check blood glucose
Sodium Chloride	1st	Over 1hr	-	10 Units IM	
	2nd	Over 2 hours	20 mmol/litre	10 Units IM	

0.9 % IV infusio n	3 rd	Over 4 hours	20 mmol/litre	10 Units IM hourly	Based on blood glucose
	4 th	Over 6 hours	20 mmol/litre		
	5th	Over 8 hours	40 mmol/litre		
If blood glucose < 14- 16 mmol/litre and pt is improving change to:					
D/W 5%		8 hourly	Potassium 600 mg oral twice daily for 1 week	Insulin subcutaneo us According to sliding scale	Based on blood glucose
If patient is stable refer to a higher level for maintenance therapy					

Sliding scale:

Blood sugar	Soluble Insulin subcutaneous
>16 mmol	12 Units
12-16	8 Units
8-12	4 Units
< 8 mmol	0 Units

1.2. NON INSULIN DEPENDANT DIABETES

This can often be treated with diet, loss of weight and if needed oral anti-diabetic agents. Symptoms and levels of glucose in the urine can guide your treatment.

Management:

Diet:

- Absolutely no sugar, meaning no sugar in the tea, no sodas, no biscuits, no sweets
- Reduce staple food like ugali and rice. It is better to eat vegetables and meat
- Stop alcohol
- In general reduce calorie intake especially if people are overweight
- Increase exercise

Medication:

- To be started by a doctor, follow up can be done at PHCC level
- Recheck the urine for sugar in two weeks. If no improvement check and reinforce the diet
- If there is still no improvement after 1 month, consider medication
- Start with Glibenclamide 2.5 mg once daily with breakfast
- Check regularly and reinforce diet
- If there is no improvement increase to 5 mg in the morning
- Give it time to work, do not increase fast
- If there is no result after several months add an evening dose, first 2.5 mg, can be increased to 5mg

Rule for oral anti diabetics: Start low, go slow
--

- If there is no response and especially if the patient is very obese add Metformin
- Start with 500 mg in the morning, monitor over several weeks, if no improvement add another dose
- Both medications should not be given in pregnancy. If patient is pregnant refer immediately
- If poorly controlled despite diet and medication change to insulin

Drug	F	Dose Frequency	Caution
Glibenclamide 2.5 mg	H	Start with 2.5 mg once a day, maximum dose 10 mg/day	Increase slowly Always include diet
Metformin 500mg	H	500 mg once a day, max dose 1500 mg/day	

COMA

In diabetic patients you can have two types of coma:

1. THE HYPERGLYCAEMIC COMA

This coma occurs when the blood sugar level is far too high. This can happen in:

- New undiagnosed diabetic patients
- Diabetic patients who are on oral anti diabetics, but not reacting well enough
- Patients on medication who failed to take it
- Patients who got destabilised for some other reason, like an infection

Treatment:

As described above, but in a known diabetic first exclude hypoglycaemic coma.

2. THE HYPOGLYCAEMIC COMA

This occurs when the blood sugar is too low. This can only happen in diabetic patients on treatment:

- They have taken too much insulin
- They have taken too much oral anti-diabetic tabs
- They have not eaten enough
- Combination with alcohol
- Illnesses with diarrhoea and vomiting
-

Diagnosis:

- Take a good history
- Patients often have initial signs of sweating, irritability or some confusion
- Urine in sugar is mostly negative and blood sugar is very low

In a known diabetic patient in coma, Always exclude a hypoglycaemic coma FIRST. If in doubt administer Dextrose 50% Initially.

Treatment:

- Administer Dextrose 50% IV 20 ml immediately
- Then administer Dextrose 5% until the patient can take oral feeds
- Adapt the anti diabetic treatment
- Repeat health education
- The best treatment is prevention:
 - ❖ Explain symptoms of hypoglycaemia to the patient and adult (in the case of a child): hunger, sweating, irritability, confusion
 - ❖ A diabetic patient on treatment should always carry some sweets, in case he feels the above symptoms and should take one or two when required

HEALTH EDUCATION

A patient with diabetes needs a lot of health education. Several points have already been mentioned before:

- Diet
- Regular lifestyle

- No alcohol
- Lifelong medication
- Signs of hypoglycaemia and what to do
- Regular follow up
- Inform relatives
- Foot care: keep feet clean and dry, wear sensible shoes or thick sandals. Patients with diabetes are more prone to infections on their feet and the healing tendency is very poor
- If the patient is pregnant refer immediately
- Insulin:
 - Store in a cool dry place
 - Inject subcutaneously (under the skin)
 - Clean and dry the skin
 - Use different places, like thighs and abdomen
- Syringes:
 - Store syringes in a dry and clean place
 - Never let the needle be used by other patients
 - Keep out of reach of children

2. THYROID DISEASES

Thyroid diseases are conditions where the thyroid gland is either producing too little or too much hormone.

2.1. HYPERTHYROIDISM

This is the excessive production of thyroid hormone. It can be caused by infection, tumors or spontaneously.

Clinical features:

- Weight loss with increased appetite
- Swelling in neck (goitre)
- Palpitations and tremor of hands
- Irritable, nervous
- Insomnia
- Always feeling hot
- Reduced menstruations
- Diarrhoea
- High blood pressure
- Sometimes protruding eyes

Diagnosis:

Needs specialized lab to do T3, T4 and TSH

- May need scans or biopsy

Treatment:

- Refer to a specialized hospital. Management is only possible after a proper diagnosis
- Possibilities are:
 - Medical treatment with Carbimazole
 - Surgical treatment

2.2. HYPOTHYROIDISM

Deficient production of thyroid hormone, can be due to auto immune disease, surgery (of goiter) or other causes

Clinical features:

- Dull expression, puffiness
- Hoarse voice, slow speech
- Hair and skin coarse and dry
- Forgetfulness, slow personality change
- Slow pulse
- Constipation (often)
- Numbness of hands and feet

Diagnosis:

- Needs specialized lab to do T3, T4 and TSH

Management:

- Thyroxine
- To be started by a doctor only after official diagnosis

2.3. ENDEMIC GOITER

This is enlargement of the thyroid gland often with a normal function in the mother but it can cause cretinism (mental retardation in her baby). It is caused by lack of iodine. Because most parts of the world use iodized salt these days it has become a rare disease, but still present in parts of Sudan

Treatment:

- Iodine
- Occasionally surgery may be needed if the goiter gets very big

Prevention:

24. BONE/JOINT RELATED DISEASES

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BONE/JOINT RELATED DISEASES

For fractures see chapter on trauma.

BACK AND NECK PAIN

These are very common complaints, often related to hard work, incomplete diet or multiple pregnancies

- Exclude serious disease (TB, Fractures, etc)
- Reassure the patient
- Advice on reducing of work load if possible
- Advice home remedies like massage, oil etc.
- Only give pain killers when the pain is severe, and not on a long term basis

RHEUMATOID ARTHRITIS AND JUVENILE CHRONIC ARTHRITIS

Many people complain about rheumatic pains, but only a very small minority really has rheumatoid arthritis.

Clinical signs:

- Obvious swelling of joints, usually small peripheral joints of hands and feet
- General feeling of being unwell
- Often a raised ESR (non specific)
- Sometimes associated with iritis

Treatment:

- First line treatment is Acetylsalicylic acid (not Paracetamol)
- Second line (can be combined with acetylsalicylic acid) is Diclofenac
- In chronic severe cases add a daily dose of Chloroquine
- In severe cases Prednisolone may be needed for a limited period
- Advice rest during an acute flare-up, but try to mobilize the patient gently as soon as there is improvement
- Physiotherapy is useful to keep the patient mobile and prevent contractions

Drug	HF	Dose	Frequency	Duration
Acetylsalicylic acid 300 mg tablets	U	15-30 kg : 300 mg Adults 600 mg	3-4 times daily	As required
Diclofenac sodium 50 mg 1-3 mg/kg/day	C	10-20 kg = 12.5 mg 20-30kg = 25 mg adults : adults	2 times daily 2-3 times daily	As required
Chloroquine 150 mg base oral	H	150 mg base	Once daily	Long term, review regularly
Prednisolone 5 mg tabs	H	2.5-10 mg	Once daily Or alternate days	Limited period

SICKLE CELL ANAEMIA

Although this is not a typical bone disease the first presentation is often pain and swelling in hands and feet in young children. The condition is inherited and more prevalent in certain tribes. See chapter on anaemia

GOUT

Gout is still uncommon in Southern Sudan but with changing lifestyles it may increase. It is caused by high levels of uric acid.

Clinical signs:

- Acute severe pain and swelling in one or more joints
- Most often involved is the metatarsophalangeal joint of the big toe

Treatment:

In acute attack:

- Bedrest
- Exclude septic arthritis
- Diclofenac 50 mg 3 times daily (avoid Acetylsalicylic acid)
- Plenty of fluids

Prevention of new attacks:

- Reduce weight
- High fluid intake (>3litre per day)
- Avoid red meat
- No alcohol

SEPTIC ARTHRITIS / ACUTE OSTEOMYELITIS

This is a very dangerous and largely under diagnosed condition. It is a bacterial infection of the joint or bone, occurring mostly in children or teenagers. In most cases parents will relate it to a minor trauma which can mislead the health worker in making the diagnosis.

**In any tender, acute swelling of a joint or bone accompanied with fever
always consider septic arthritis / osteomyelitis**

Clinical features:

- Acute, painful swelling of a joint or bone
- Fever and general illness
- Often a history of a minor trauma but on closer asking the pain often started much later.

Treatment:

- Any acute swelling of a bone or joint, combined with fever refer to a hospital immediately
- Diagnosis can often be confirmed by aspiration of the swelling, especially in the later stages
- Bed rest
- Start patient on Cloxacillin IV, change to oral when condition improves
- In most cases where the condition has lasted over 24 hours surgical incision and drainage is needed, and definitely when there is pus on aspiration
- If the process has a slower onset consider also TB or brucellosis (see chapter TB)

Drug	HF	Dose	Frequency	Duration
Cloxacillin IV 500 mg vial	H	10-20 kg: 250 mg IV 20-30 kg: 500 mg IV Adults: 1-2g IV	4 times daily	4-6 weeks , if condition improves switch to oral
Cloxacillin 250mg caps	H	As above	4 times daily	

CHRONIC OSTEOMYELITIS

This is the result of a poorly treated acute osteomyelitis

Clinical features

- Scarred irregular area on one of the long bones
- Long history of tenderness on and off
- Fistulas discharging pus or fluid can be present

Treatment:

- Antibiotics alone are not recommended
- Surgery can at times be useful if there is a sequester (a piece of dead bone in the infection)
- Results are often poor and condition can flare up regularly

25. DENTAL CONDITIONS

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Dental Conditions

Dental diseases exert a high burden on the quality of life in terms of anxiety, fear, pain and loss of function. The most important factor to good management of dental patients is therefore good human relations.

COMMON PROBLEMS:

- Most patients are stricken with fear and anxiety before and during a dental visit
- Many people present late, which leads health personnel into what has been labelled ‘victim blaming’.

MINIMIZE FEAR AND ANXIETY

- Understand that factors such as poverty, low awareness, fear, disempowerment especially among women and children play a role in late presentation. Empathise!
- Provide a non-threatening environment: friendly staff, pleasant smell and equipment not too obvious
- Communication. Explain equipment and procedure before any action, especially painful procedures like injections

HISTORY, EXAMINATION AND DIAGNOSIS

In 80 % of the cases the history and examination will suffice to provide a definitive diagnosis. The other 20% of cases may require confirmation using either X-rays or other tests.

HISTORY

- Establish the main complaint and its nature (pain, swelling, bleeding, discomfort etc)
- Duration of problem
- Initiating or relieving factors
- Location of the problem
- Previous dental history
- Relevant medical and social (smoking, alcohol, etc) history

EXAMINATION:

- General physical condition
- Swelling
- Facial asymmetry indicating dislocation or fractures
- Signs of pain

- Ulceratio

INTRA-ORAL EXAM

Start with the chief complaint. However it is important to examine all the tissues and structures. Adopt a fixed routine.

- o Check all the soft tissues
- o Examine all the teeth for cavities, mobility, discolorations, fractures, erosion, attrition, and hygiene
- o The gums for swellings, bleeding, discolouration, discharge, pockets, recession, ulcerations

LOCAL ANAESTHESIA

90% of dental procedures that require anaesthetics can be done under local anaesthetics (L.A.), most common by infiltration. Inject the local anaesthesia solution at or around the apex of the tooth or into the tissues. During injection pain is mainly caused by the pressure of depositing the solution in the tight tissue against the bone. To minimize this release the solution very slowly. Preferably use a cartridge syringe. The commonly used solutions are Lignocaine, Lidocaine or Prilocaine 1.8ml with 2% Adrenaline.

GUIDELINES FOR TREATING TRAUMA

Trauma cases usually present as emergencies. Three objectives should be aimed for first:

- control bleeding by pressure pack
- control pain by anaesthetics and analgesic
- control infection by doing oral cleaning and prescribing antibiotics

Trauma cases can be classified into the following:

- Injury to the soft tissue
 - Injury to the teeth
 - Injury to the bone
- Or combination

TREATMENT GUIDELINES FOR TRAUMA

Type of Dental Injury	Diagnosis	Treatment
	Clinical findings	
Concussion:	Tooth tender to touch. No mobility or sulcular bleeding	Observation
Sub-luxation	Tooth is mobile but not displaced. Sulcular bleeding	If there is no occlusal interference, let the tooth reposition spontaneously, otherwise, reposition and splint as needed.
Lateral luxation/ intrusion	The tooth is displaced laterally with the crown usually in a palatal direction or through the labial bone plate	Refer
Extrusion/avulsion	Tooth is mobile and extruded from the socket or out of the socket	Referring is only useful if there is a dentist nearby

Guidelines for treating Dental Caries

Lesion	Signs & symptoms	Treatment option
Initial caries (white lesion)	Decalcified smooth surface which looks chalky white-without cavitation Sticky occlusal grooves and pits on a sharp probe	Treat the chalky smooth surface with topical fluorides; encourage use of fluoride toothpaste and reduction in frequency of sugar consumption For the sticky grooves place fissure sealants or conservative composite restoration
Enamel caries all classes I – V	Frank cavity but not sensitive	In children restore with glass ionomer. For adults use composite.
Minimal dentine caries all classes I-V	Frank cavity sensitivity to temperature change especially cold.	Glass ionomer for children. Composite for adults both anterior & posterior or amalgam for the posterior.
Extensive dentine caries all classes	Frank cavity. Pain during eating. Pain on probing	Indirect pulp capping with calcium hydroxide, followed by a base material and restore with either composite** or amalgam.
Class V – Non carious due to	Cavitation at the necks.	Clean with non-fluoride paste.

abrasion	Sensitivity to cold.	Restore with composite.
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NOTE THE FOLLOWING

1. ** The only material that can serve as a base under composite is glass ionomer. Never use ZNO eugenol under composite.
2. Most extensive caries will require temporary restoration at first visit, then permanent restoration after 4-6 weeks if the tooth is asymptomatic.
3. Children usually present with frank open cavities. These should be gently excavated without drilling then sealed off with glass ionomer.
4. Posterior (condensable) composites are as strong as amalgam and are therefore material of 1st choice.
5. Diagnosis of caries is mainly by visualisation. Ask the patient to rinse, then dry the teeth with air syringe and provide a good light. Probing can break into lesions which have not yet been cavitated. Thus only probe frank cavities for pain or sensitivity diagnosis.

Guidelines for Periodontal Treatment

Condition	Signs and symptoms	Treatment options
Chronic marginal gingivitis (gum disease)	Red, swollen margins easily retractable from the tooth. Bleed easily when brushing or probed.	• Scale & polish. • Deal with local irritants e.g. rough fillings, calculus. • Oral hygiene instruction.
Early periodontitis	Progression of gingivitis to the alveolar bone crest. Moderate pockets. Slight exudates from pockets. Halitosis.	• Deep scaling with root planning. • Deal with local factors. • Oral hygiene • Antibiotics.
Moderate periodontitis	More alveolar bone loss. Some tooth mobility. Deeper pockets. Exudation from pockets. Halitosis. Immune depression may exist.	Refer

NOTE THE FOLLOWING

Chronic marginal gingivitis is the commonest health problem affecting most of your patients. It may involve a single focus or the entire mouth. Re establishing and maintaining oral hygiene is paramount.

GUIDELINES FOR SIMPLE SURGICAL TREATMENT

Dental clinical officers are expected to handle a limited variety of surgical cases including the following:

- Non-surgical extractions
- Removal of exposed roots
- Incisions for drainage of pointing abscess
- Suturing soft tissue injuries

Indications/ condition	Treatment
-Carious teeth with irreversible pulpitis -Mobile teeth due to advanced periodontal disease -Clearance for dentures - Mobile deciduous teeth	Extraction with elevators and forceps under L.A.
Retained roots, which are not submerged	Extracted with elevators under L.A.
A localised fluctuant swelling with pain tenderness, and warm to touch – dental abscess	Incision and drainage + antibiotics and analgesics. Extract the tooth after the abscess has subsided
Painful wisdom teeth, which are submerged partially by tissue – impacted molars	Prescribe antibiotics + analgesics and refer to the Dentist for disimpaction

GUIDELINES FOR PAIN MANAGEMENT

A majority of visits to the Dental Clinic are triggered by pain. Take a good history and proper exam to identify the cause of the pain.

Type of pain	Signs and symptoms	Treatment
Reversible Pulpitis Level I	Pain of short duration triggered by hot, cold or sweet things. May be associated with a small cavity, a crack or abrasion.	Apply a desensitising agent, topical fluoride. In case of a cavity or abrasion restore
Reversible Pulpitis Level II	All the above including a deep cavity which is painful during eating. -The pain responds to analgesics.	Gently excavate, place calcium hydroxide and a temporary filling. Give antibiotics and analgesics. Permanent filling after 4-6 weeks
Irreversible Pulpitis	Persistent pain, worse by hot stimuli and when patient lies down. Pain is throbbing and dull, not responding to analgesics.	Extract the tooth under L.A .
Neuralgia	Due to inflammation of the nerves. Often history of difficult extraction Pain radiates along the root of the nerve.	Refer to Dentist
Pain due to bone fractures	History of injury Associated with swelling, displaced occlusion, facial asymmetry.	Immobilise the fracture with a bandage, give antibiotics and analgesics. Then refer.

FAINTING

Occasionally emergencies occur in the Dental Clinic. The main incident is fainting.

Management

- A proper assessment of the general condition. Do not treat patients with serious conditions (e.g. diabetes, heart disease) at centre level
- If the patient gets unwell call for a medical back up
- Lie the patient down and elevate the feet

26. PALLIATIVE CARE / HOME BASED CARE

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PALLIATIVE CARE / HOME BASED CARE

There are diseases that cannot be cured, like terminal AIDS or cancer. In general most people prefer to die amongst their beloved ones and not in a strange hospital. Still the health staff should give the relatives the tools and information to make life for the patient in this last stage as comfortable as possible.

GENERAL GUIDELINES:

- Explain the condition to patient and relatives; be honest
- Take time to answer questions and discuss concerns
- Explain nursing care and medication
- Consider physical, psychological and spiritual distress
- Involve other counselors when needed

MANAGEMENT OF SPECIFIC SYMPTOMS:

PAIN:

General management:

- Make sure the patient is in a comfortable position. Keep him / her mobile as long as possible. If completely bed ridden change sides regularly
- Distraction / emotional comfort is a very valuable remedy in pain
- Traditional treatment like gentle massage or herbal teas are also helpful

Medical management:

- For mild / moderate pain use Paracetamol or Acetylsalicylic acid
- If required add Diclofenac or Codeine
- In severe pain give Morphine on a regular basis, Morphine is addictive, so only give it to terminally ill patients
- In patients with terminal illness give the medicines on a regular basis, do not wait till the previous dose has fully worn off
- Create a system in which the relatives can collect new medication if the patient is too ill to travel
- Codeine and morphine can be combined with the normal painkillers
- Side effects of Codeine and Morphine are
 - Addiction – only administer to terminally ill patients

- o Constipation - give plenty of fluids and Senna tablets when required
- o Nausea/vomiting - normally only for a few days, add Promethazine if needed
- o Drowsiness

Drug	HF	Dose	Frequency	Duration
Paracetamol 120 mg tablets 10 mg/kg or 500 mg tabs	U	4 -14 kg = 120 mg 14 -25 kg = 240 mg adults: 500-1000mg	3-4 times daily	As required
Acetylsalicylic acid 300 mg tablets	U	Adults only: 300-900mg	3-4 times daily	As required
Diclofenac sodium 50 mg 1-3 mg/kg/day	C	10-20 kg = 12.5 mg 20-30kg = 25 mg adults : 50mg	2 times daily 2-3 times daily	As required
Codeine phosphate 30 mg	H	Adults: 15-60 mg	Every 4 hours	As required
Morphine oral solution 10 mg/5ml	H	Adults: start with 5 mg per dose, increase to 30 mg if needed	Every 4 hours	Review regularly
Promethazine 25 mg tabs	C	Adults: 25 mg	2-3 times daily	As required

NERVE COMPRESSION

This can be caused by a tumor / swelling compressing a nerve.

- Give Prednisolone in addition to painkillers
- If the patient is not terminally ill reduce the Prednisolone slowly once clinical improvement occurs

Drug	HF	Dose	Frequency	Duration
Prednisolone 5 mg tabs	H	5-10 mg	3 times daily	Until clinical improvement

RAISED INTRACRANIAL PRESSURE

This can be caused by a tumor or other process.

- Give painkillers (Morphine) as above
- Add Prednisolone
- Occasionally diuretics can be useful

Drug	HF	Dose	Frequency	Duration
Prednisolone 5 mg tabs	H	20-30 mg	3 times daily	Until clinical improvement

NEURALGIC PAIN:

This can happen for example after herpes zoster. Also phantom limb pain (after an amputation) can be treated like this.

- Painkillers as above
- If there is no relief, add Amitriptyline or Carbamazepine

Drug	HF	Dose	Frequency	Duration
Amitriptyline 25 mg tabs	H	25 to 150 mg max	At night	Increase slowly
Carbamazepine 200 mg tabs	H	100 mg to 400 mg max	1-2 times a day	Increase slowly

NAUSEA/VOMITING

- Small frequent meals
- Make sure the patient drinks enough
- Try soup and herbal teas
- Promethazine 25 mg 2-3 times daily in severe cases

LOSS OF APPETITE / DIFFICULTY IN EATING

- Good mouth care: tooth brushing, mouth washes
- Gentian violet in cases of oral thrush
- Small frequent easily digestible feeds
- Enough fluids
- Multivitamins can be useful

DIARRHOEA:

- Exclude common causes (bacteria, giardia etc)
- Plenty of fluids, ORS if needed
- In severe cases give Codeine or Loperamide (only if other causes are excluded)
- Facilitate the toilet if needed, e.g. put a chair with a hole on top of the pit latrine, if the patient is too weak to squat

Drug	HF	Dose	Frequency	Duration
Codeine phosphate 30 mg tabs	H	15-60 mg	Up to 4 times a day	Increase or reduce as needed
Loperamide 2 mg	H	2 mg to max 8 mg	2 times daily	Increase as needed ,then maintain

SHORTNESS OF BREATH

- Exclude causes like pneumonia, pleural effusion or heart failure
- Make the patient comfortable, prop him/her up in half sitting position and let a relative stay
- Regular Morphine is helpful (for dose see above)

BED SORES

The keyword here is prevention, once the patient does have bed sores they are very difficult to treat.

- If a patient who is bed ridden or unconscious change his/her position 2 hourly
- Make sure the sheets/ mattresses are clean and even
- Take special care of pressure points like sacrum, hips and heels
- Once the patient has sores put no pressure on these areas and do normal wound care

DEPRESSION, INSOMNIA AND ANXIETY

- Give the patient enough chance to talk
- Help with practical arrangements for the future of his/her family
- Involve counselors / pastors if needed
- Mild sedatives like Diazepam may be helpful
- In severe depression use antidepressants (see chapter on psychiatry)

27. NATURAL MEDICINES

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NATURAL MEDICINES

There is an enormous wealth of natural medicine in nature. Also simple changes in lifestyle can help for some complaints.

This book cannot go into details, but just wants to give a few examples in this chapter. If a person is very ill he/she should first go to a clinic to exclude infections.

NUTRITION

Moringa trees can grow almost everywhere in Sudan, and need very little water. The leaves contain vitamin A, vitamin C, iron, calcium, potassium and protein. If the leaves are cooked with the food or eaten raw in a salad this is a very good addition to a child's diet. The leaves can also be dried (in the shade) and pounded into powder, for use at the time when the tree has no leaves.

NAUSEA IN PREGNANCY

- Eat something plain like bread or rice before getting up
- Chew a piece of ginger before eating food
- Drink a cup of ginger tea if you feel sick
- Eat small meals, avoid oily foods
- Lick a lemon

HEARTBURN

- Eat small meals, especially not a large meal before going to bed
- Store some sweet potato powder in a jar and take a spoonful every time you feel heart burn
- Drink some milk if available
- Sleep with your head raised

OEDEMA

- First seek advice from the health centre
- Raise your feet when you rest
- Kerkede tea is a mild diuretic and helps reduce swelling

CONSTIPATION:

- Drink plenty of fluids
- Lemon grass tea is helpful: crush a handful of fresh or dry leaves in 1 litre of boiling water. Infuse for 10 minutes.
- Eat fruit and green vegetables
- Take enough exercise

MOUTH PROBLEMS

- Brush teeth twice a day
- Gently clean between the teeth with a neem stick

ORAL THRUSH

Lemon mouthwash or garlic juice

WORMS

Crush 10 papaya seeds to powder and swallow with water. For a child of 3 years give 3 seeds, for a child of 6 years give 6 seeds.

INDIGESTION

Chew 3 papaya seeds after a meal. Ginger tea or lemon grass tea also work.

SMALL CUTS AND WOUNDS

Cut a small piece of fresh papaya leave and cover the wound

INFECTED WOUNDS, BURNS

Cut a small slice of unripe papaya, place the cut side against the wound and tie it with a bandage or strip of cloth. Leave it in place for two hours (not longer), then remove. Repeat in the evening with a fresh piece. Continue for 3 or 4 days.

HEAD LICE

Pound the neem seeds and apply to the scalp

SCABIES

Pound the neem leaves and apply the paste to the body

COUGH

Finely cut 4 or 5 cloves of fresh garlic and pound. Add a tablespoon of honey. Take a teaspoon 3 times a day

SORE THROAT

Lemon juice and honey in hot water

RHEUMATISM OINTMENT

Pound one measure of dry chillies into a powder. Add 4 measures of cooking oil. Heat the chillie powder in a small saucepan floating in a larger pan of hot water over a fire for 1 hour. Filter it. Return it to the pan and add half a

measure of bees wax. Stir well. Remove from fire to cool and store in small containers. Rub into sprained or painful joints.

Note: do not touch the eyes.

HAEMORRHOID OINTMENT

Chop some dry leaves of lemon grass and guava finely. Add two measures of leaves to 10 measures of vegetable oil. Heat these in a small saucepan over a larger one with water in it for one hour. Filter and return to the pan and add one measure of bees wax. Stir well and cool. Store in small containers.

SLEEPLESSNESS

Take one handful of dry or fresh passion fruit leaves. Boil them in a cup of water for 10 minutes. Sieve out the leaves. Drink before bed time.

NERVE PAIN

Kerkede

TOOTHACHE:

Cloves

PROTECTION AGAINST MOSQUITO BITES:

Neem oil

PAEDIATRIC DRUG DOSES

PAEDIATRIC DRUG DOSES

Children's doses are stated in the individual treatment chapters. Doses are generally based on body-weight (in kilograms) or the following age ranges:

- Neonate (first month)
- Up to one year (infant)
- 1 – 5 years
- 6 – 12 years

The dosage per kg is not applicable for children >40kg.

A conversion table is provided to assist in calculating the dosages using varying metric units such as milligrams and micrograms.

1000micrograms (mcg)	1 milligram (mg)
1000 milligrams (mg)	1 gram (g)
1000 grams (g)	1 kilogram (kg)

The following table gives indicative doses for children and infants over 1 Month.

Drug	Route	Dose	Frequency	Duration
Aminophylline 25mg/ml	Slow IV	5mg/kg	Every 8 hours	Until pt can take oral treatment
Amoxicillin 250mg breakable tablets	PO	16mg/kg	Every 8 hours	10 days
Ampicillin 500mg injection	IM / IV	Mild:12,5mg/kg Severe:25mg/kg	six hourly	Until child can take oral amoxicillin
Atropine sulphate	IV	20mcg/kg	Before induction of anaesthesia	

Benzylpenicillin	IM / IV	100mg/kg (80 000IU/kg)	Six hourly	Until pt can take oral
Chloramphenicol 1gm inj.	IV	12.5mg/kg	4 times daily	7 days
	IM	500mcg/kg	Every 6 – 8 hours	
Ciprofloxacin 250mg tablet	PO	10 - 30mg/kg	2 times daily	3 days
Cloxacillin 500mg injection	IV	12.5mg/kg	4 times daily	7 days
Cotrimoxazole 120mg tablets	PO	24mg/kg	2 times daily	5 days
Diazepam 10mg / 2ml	IV / PR	0.3mg/kg	For convulsions	
Digoxin	PO	Initial 0.01mg (10mcg/kg) Maintenance 0.005mg (5mcg/kg)	Every 8 hours Every 12 hours	For 3 doses
Erythromycin 250mg tablet	PO	12.5mg/kg/dose	4 times daily	7 days
Ethambutol	PO	15mg/kg	Once a day	According to TB policy
Ferrous sulphate/Folic acid	PO	2mg iron/kg	Every 8 hours	2 – 3 months
Folic acid 5mg tablet	PO	1 to 2mg/kg	Once a day	2 – 3 months
Furosemide	IV PO	1mg/kg (max 5mg) 1 to 3mg/kg	Before transfusion Once a day	
Gentamycin	IM / IV	7.5mg/kg	Once daily 	7 – 10 days
Griseofulvin	PO	5mg/kg	Every 12 hours	7 days

Hydrocortisone 100mg inj.	IM	10mg/kg	Once	
Isoniazid	PO	10 to 20mg/kg	Once a day	According to TB policy
Metronidazole 200mg tablet	PO	10mg/kg	3 times daily	5 days
Paracetamol 120mg tablets	PO	10mg/kg	3 – 4 times daily	2 – 3 days
Pethidine	IV / IM	1mg/kg	Every four hours	Until pt can take oral
Phenobarbital 30mg tablet	PO	5mg/kg	Once daily	
Prednisolone	PO	1 to 2mg/kg	Once a day	
Procaine penicillin	IM	50mg/kg	Once a day	
Promethazine 25mg tablet	PO	0.3mg/Kg	2 – 3 times daily	When required
Quinine 300mg/ml injection	IV PO	10mg/kg 10mg/kg	Eight hourly Eight hourly	Until pt can take oral 7 days
Rifampicin	PO	10 to 20mg/kg	Once a day	According to TB policy
Salbutamol 4mg tablets	PO	0.1 – 0.15mg/kg	3 times daily	Continue for two after the wheezing has stopped
Streptomycin	IM	20mg/kg	Once a day	According to TB policy
Thyroxine sodium	PO	10 to 50mcg/kg	Once a day	

Drugs in Pregnancy and during breast feeding

Drugs in Pregnancy and during breast feeding

During pregnancy mother and fetus form a non-separable functional unit.. If you have to treat the mother you have to consider the effect of the treatment on the unborn child. Some drugs can harm the fetus. The same is true during breastfeeding. Some drugs may pass into the milk.

Always ask any woman of childbearing age if they are or may be pregnant. Not all women will tell you this spontaneously. Drugs should be prescribed in pregnancy only if the expected benefits to the mother are thought to be greater than the risk to the fetus. All drugs should be avoided if possible during the first trimester. The following list includes drugs which may have harmful effects in pregnancy and indicates the trimester of risk.

Table of drugs to be avoided or used with caution in pregnancy and breastfeeding

Drug	Trimester	Note	Breast feeding	Comment
INN	1/2/3/All	Avoid / Caution		
Acetylsalicylic acid	3	Avoid	Avoid, risk of Reyes syndrom	Risk of haemorrhage;
Albendazole	1 2 & 3	Avoid Caution		Potentially teratogenic. Wait until after delivery
Alcohol	All	Avoid	Small	Regular daily drinking is teratogenic (fetal alcohol syndrome) and may cause growth retardation; occasional single drinks are probably safe
Amitriptyline	3	Caution		Convulsions in neonate
Amodiaquine + artesunate	1	Caution		According to malaria policy
Artemether +	All	Avoid		Toxic

Lumefantrine	All	Avoid		Toxic
Artesunate	1	Avoid		High side effects
Atenolol	All	Caution		May cause intrauterine growth restriction, neonatal hypoglycaemia, and bradycardia; risk greater in severe hypertension
Azithromycin	All	Caution		Use only if potential benefit outweighs risk, this is the case if the mother has gonorrhoea, both dangerous for mother and child
Bupivacaine	3	Avoid		Neonatal respiratory depression, hypotonia, and bradycardia after paracervical or epidural block
Carbamazepine	1	Avoid		Risk of teratogenesis including increased risk of neural tube defects
	3	Caution		Possible cause of vitamin K deficiency and risk of neonatal bleeding
Chloramphenicol	3	Avoid	May cause bone marrow depression in infant	Neonatal 'grey' syndrome
Chloroqui not to be used anymore				
Chlorpromazine	3	Caution		Extrapyramidal effects in neonate occasionally reported
Ciprofloxacin	All	Avoid		safer alternatives available
Clomifene	All	Avoid		Possible effects on fetal development, is an infertility drug anyway
Codeine	3	Avoid		Depresses neonatal respiration
Dexamethasone	All	Caution		Benefit of treatment outweighs risk, especially in premature labour for a 24 hours course; risk of intrauterine growth retardation on prolonged or repeated systemic treatment
Diazepam	All	Caution	Avoid repeated doses	Avoid regular and prolonged use (risk of neonatal withdrawal symptoms, neonatal hypothermia,

				hypotonia and respiratory depression)
Digoxin				May need dosage adjustment
Doxycycline	All	Avoid	Avoid	Dental discoloration; maternal hepatotoxicity with large doses
Ephedrine	All	Caution		Increased fetal heart rate reported with parenteral ephedrine
Furosemide	All	Avoid		Not used to treat hypertension in pregnancy
Gentamicin	2 & 3	Avoid		Auditory or vestibular nerve damage
Glibenclamide	3	Avoid		Neonatal hypoglycaemia; Change to insulin
Griseofulvin	All	Avoid		Fetotoxicity and teratogenicity; important: effectiveness of oral contraceptives reduced
Haloperidol	3	Avoid		Extrapyramidal effects in neonate occasionally reported
Halothane	3	Avoid		Depresses neonatal respiration
Heparin	All	Avoid		Maternal bone demineralization and thrombocytopenia reported after prolonged use
Hydralazine	1 & 2 3	Avoid		No reports of serious harm following use in third trimester
Hydrochlorothiazide	1 & 2 3	Avoid Avoid		Not used to treat hypertension in pregnancy May cause neonatal thrombocytopenia
Hydrocortisone	All	Caution		Benefit of treatment outweighs risk; risk of intrauterine growth retardation on prolonged or repeated systemic treatment
Ibuprofen	All	Avoid		Paracetamol is preferred analgesic
Insulin	All	Caution		Insulin requirements should be assessed frequently by an experienced diabetic clinician
Iodine	2 & 3	Avoid		Neonatal goitre and hypothyroidism
Ketamine	3	Avoid		Depresses neonatal respiration
Levothyroxine	All	Avoid		May cross placenta, which can be

				detrimental to fetus
Lidocaine	3	Caution		With large doses, neonatal respiratory depression, hypotonia, and bradycardia after paracervical or epidural block
Magnesium sulfate	3	Caution		Not known to be harmful for short-term intravenous administration in eclampsia but excessive doses may cause neonatal respiratory depression
Mebendazole	All	Caution		In areas with high worm loads the benefit of deworming can be higher than the risk. Avoid in first trimester.
Metformin	All	Avoid		Change to insulin
Metronidazole	1 2 & 3	Avoid Caution		Avoid high-dose regimens
Morphine	3	Avoid		Depresses neonatal respiration; withdrawal effects in neonates of dependent mothers; gastric stasis and risk of inhalation pneumonia in mother during labour
Nalidixic acid	All	Avoid		Safer alternatives available
Naloxone	All	Caution		Use only if potential benefit outweighs risk
Nevirapine	1 2 & 3	Avoid Caution		Benefit of treatment considered to outweigh risk
Norethisterone	All	Avoid		Masculinization of female fetuses and other defects reported
Phenobarbital	1 & 3	Avoid	Inhibits infants sucking reflex	Congenital malformations; risk of teratogenicity greater if more than one antiepileptic used. May possibly cause vitamin K deficiency and risk of neonatal bleeding
Phenytoin	1 & 3	Avoid		Congenital malformations; risk of teratogenicity greater if more than one antiepileptic used. May possibly cause vitamin K deficiency and risk of neonatal bleeding
Podophyllum resin	All	Avoid		Neonatal death and teratogenesis
Polyvidone–iodine	2 & 3	Avoid		Sufficient iodine may be

				absorbed to affect the fetal thyroid
Praziquantel	All	Caution		Benefit of treatment in schistosomiasis outweighs risk
Prednisolone	All	Caution		Benefit of treatment outweighs risk; risk of intrauterine growth retardation on prolonged or repeated systemic treatment
Pyrimethamine	1	Avoid		Theoretical teratogenic risk (folate antagonist); Avoid in Pneumocystosis and toxoplasmosis
Retinol	All	Avoid		Excessive doses may be teratogenic
Silver sulfadiazine	3	Avoid		Neonatal haemolysis and methaemoglobinaemia
Spironolactone	All	Avoid		Toxic
Sulfadiazine	3 1 2 & 3	Avoid Avoid Caution		Neonatal haemolysis and methaemoglobinaemia In toxoplasmosis if danger of congenital transmission
Suxamethonium	All	Avoid		Mildly prolonged maternal paralysis may occur
Thiopental	3	Caution		Depresses neonatal respiration
Vaccines				First trimester: Theoretical risk of congenital malformations, but need for vaccination may outweigh possible risk to fetus
Valproic acid	1 & 3	Avoid		Increased risk of neural tube defects; risk of teratogenicity greater if more than one antiepileptic used
Warfarin	All	Avoid	Caution risk of haemorrhage	Congenital malformations; fetal and neonatal haemorrhage

REFERENCE RANGES OF COMMON LABORATORY TESTS

haemoglobin		
Men	11.5-18.0 g/dl	
Women	10.5-16.5 g/dl	
Newborn (full term)	12.5-19.5 g/dl	
Children < 3 months	9.5-13.5 g/dl	
Children 3-12 months	10.5-13.5 g/dl	
Others	10.5-14.5 g/dl	
White blood cells		average % of lymphocytes of total wbc
Child 1 day	9.000-29.000 cells/ml	30%
Child 3 months	5.000-17.000 cells/ml	60%
Child 5 years	4.000-14.000 cells/ml	40%
Adult	4.000-10.000 cells/ml	30%
Biochemistry	International Units	Previous Units
Blood sugar (fasting)	3.3-6.7 mmol/l	60-120 mg/100 ml
Urea adults	3.3-7.7 mmol/l	
infants	1.3-5.8 mmol/l	
Serum creatinine male	45-105 umol/l	0.3-1.2 mg/100ml
female	45- 90 umol/l	
Calcium	2.20-2.60 mmol/l	8.8-10.4 mg/100ml
Total protein	60-80 g/L	6-8 g/100ml
Albumen	32-52 g/L	3.2-5.2 mg/100 ml
Sodium	135-146 mmol/l	135-146 mg/l
Potassium	3.5-5.0 mmol/l	3.5-5.0 mg/l
Chloride	95-105 mmol/l	95-105 mg/l
Bilirubin(Total)	5-20 Fmol/l	0.3-1.2mg/100ml
Bilirubin(Direct)	1-6 Fmol/l	0.1-0.4 mg/100ml
Bilirubin (Indirect)	2-13 Fmol/l	0.2-0.7 mg/100ml

Alkaline phosphatase in adults

Sex	30°C	37°C
Male	35-100 U/L	42-120 U/L
Female	30-90 U/L	36-108 U/L

Aspartate aminotransferase(AST)**SGOT**

Sex	25°C	30°C	37°C
Male up to	22 U/L	31 U/L	50 U/L
Female up to	16 U/L	22 U/L	36 U/L

Alanine aminotransferase (ALT)**SGPT**

Sex	25°C	30°C	37°C
Male up to	27 U/L	35 U/L	48 U/L
Female up to	20 U/L	26 U/L	36 U/L