

Diagnosis Treatment

A manual for primary health care workers - second edition



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Diagnosis and Treatment

A training manual for primary health care workers

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Foreword for the first edition

Nearly 54 million people died worldwide in 1998, the majority of them in developing countries. Many of these deaths were easily avoidable. Proven medicines or vaccines could have prevented millions of deaths from conditions such as pneumonia, malaria and tuberculosis. Iron-folate preparations could have prevented considerable maternal and child mortality by reducing anaemia in pregnancy. Treatment of sexually transmissible infections and use of condoms could have significantly reduced HIV transmission. Treatment of hypertension could have prevented many cases of heart attack and stroke.

The drugs that could have prevented these deaths are commonly termed 'essential drugs'. Essential drugs together can provide safe, effective treatment for the majority of communicable and non-communicable diseases. But their potential can be realised only if the relevant drugs are accessible, affordable, of good quality, and used rationally. Unfortunately, irrational drug use (such as overuse of antibiotics and injections, and insufficient use of effective products) is common. It can lead to treatment failure, development of drug resistance, wastage of limited family and community resources, and drug shortages.

Understanding that much irrational drug use stems quite simply from lack of information and training, VSO has developed *Diagnosis and Treatment: A Training Manual for Primary Health Care Workers*. Based on extensive field experience and field testing. This manual will help primary health care workers use essential drugs to effectively combat the ill health that continues to hinder human well-being and development in the world's poorest countries.

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Director,
Department of Essential Drugs and Other Medicines,
World Health Organisation, Geneva

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Every reasonable effort has been made to ensure the accuracy of the contents of this publication and that the publication does not suggest practices which might be dangerous. However VSO cannot accept liability for any injury or damage to persons or property arising from the use to which any, information in the text is put.

This book is dedicated to our teachers and our students.
It is also dedicated to Dr Raymond Birrell and Mrs Freda Birrell.

Introduction

Primary health care workers see patients before any other trained health workers. Primary health care workers diagnose common and important health problems and prescribe medicines. However, they may have little formal medical training and little access to help and advice. They often work in health centres with few medicines or resources. Good training for primary health care workers is, therefore, very important.

Who is this manual for?

This is a training manual for primary health care workers who work in first-level clinics, dispensaries and health centres in the developing world. Primary health care workers include nurses, medical assistants, doctors, health aides, village health workers and other paramedical health workers.

This manual will help to teach these primary health care workers how to diagnose common illnesses and how to prescribe rationally. The manual is based on a training course that was first developed in Tanzania by VSO doctors and their local colleagues. A wide range of health experts has helped to adapt that original training course to make it relevant to primary health care workers throughout the developing world.

The manual has been updated after working in rural Zambia in a primary health care setting to ensure that it remains relevant to the conditions and circumstances that are prevalent in modern day low and middle income countries.

Rational prescribing means giving the correct medicine in the correct dose for the correct length of time. It means that medicine is only prescribed if it is needed. Rational prescribing helps health workers to provide good care for their patients and to make the best use of limited supplies of medicines.

The medicines recommended in this manual are based on WHO guidelines for the use of essential drugs. The care and treatment advice in this manual is also consistent with the most important aspects of WHO's Integrated Management of Childhood Illnesses (IMCI) programme.

How can you use the manual?

The manual can be used as:

- a course guide for trainers and supervisors of primary health care workers
- a self-study guide for primary health care students.

Part 1 of the manual starts with the basic skills which health workers need for rational prescribing.

Chapter 1 tells you how to use this manual.

Chapter 2 explains how triage, how to recognise seriously ill patients and how to treat very severe febrile disease.

Chapter 3 explains how to take a history.

Chapter 4 discusses communication.

Chapter 5 introduces you to shared decision making.

Chapter 6 suggests lifestyle medicine options.

Chapter 7 gives you suggestions to improve sexual and adolescent health.

Part 2 has 15 lessons about the most important and common health problems in developing countries.

Part 3 contains 42 appendices which include reference charts, a list of medicines and their uses, and details about health problems which are only common in some areas. They provide more detailed practical information about diagnosis, treatment and procedures. Many appendices are used during the lessons.

The lessons teach primary health care workers:

- how to diagnose and treat illness
- when to send patients to hospital
- how to give advice to prevent illness.

Trainers can use the lessons as part of a training course for primary health care workers. If you are a primary health care worker or a student of primary health care, you can use the lessons to teach yourself. Whether you are a trainer or a student, you should start with Chapter 2 and Chapter 3.

If necessary, trainers and students should adapt the manual so it is consistent with the national drug policy and clinical care guidelines in your country. The advice in this manual is not intended to replace national drug and care policy. **You should adapt the course to fit guidance in your country wherever the treatment and prescribing advice in the manual is different from your national policy.**

You can change the order of the lessons and start with the most important or most common health problems in your country. The manual does not include all illnesses. You can ask a doctor or an experienced prescriber to produce extra lessons about other illnesses that are important in your country. You can also leave out parts of lessons about illnesses that are not important where you work.

This manual is updated regularly. The date of its most recent update is displayed on page ii. We suggest that you download the pdf version onto your smartphone regularly so that you can access the most recent version offline and search the text. Whilst every effort is made to give you correct information, it is possible that there are errors in the text. Please contact the authors via info@realgeneralpractice.org with corrections or suggestions.

Note on language Health workers and patients are all genders. You will often teach them individually, rather than in groups, or in a classroom. We use the pronouns they/them/their to talk about a single person, or a group of people. We use 'carer' to describe the person accompanying a child. Although girls are often at a greater disadvantage than their brothers, we have decided to use 'he' when we talk about child patients with their carers, so that it is clear that 'he' is the child, and 'she' is the child's carer.

PART 1 Basic skills

Chapter 1 How to use this manual

Guidelines for trainers

Planning the course If your trainees are already primary health care workers, plan the course over a minimum of 15 months. Teaching one lesson each month allows students to practise using new information and skills at their places of work. It also gives you a chance to observe your students at work to see how much they have learned and to help them improve.

If you are planning a course for student health workers, plan to teach one lesson each week. Teach in the language that students understand best.

Start with the lessons in Chapter 2 and 3 about taking a history and communication. Teach these chapters to each student individually. Show the student how to take a history and how to communicate. Use real patients. Allow the student to practise with patients and watch what they do. Tell the student what they have done well and show them what they can do better.

Next, start to teach the 15 lessons about common health problems. After each lesson, give students the opportunity to try out their new diagnosis and prescribing knowledge and skills with patients. At first, students will make many mistakes. Your job is to help the students to learn from their mistakes and to improve.

Before the lessons You need to prepare posters and other teaching aids before each lesson. You may need to ask some students to help you in the lesson. We tell you at the beginning of each lesson what you need to do before the lesson. Practise what you are going to teach before the lesson.

Arrange for each student to see patients with TB during the course. This might be done via WhatsApp video calls. Give each student a copy of Table 1 in Lesson 12 before they see these patients. Ask the supervising clinicians to show the students each of the symptoms in the table.

Planning the lessons Each lesson in Part 2, except Lesson 1, starts with a quiz that the students do on their own. The quiz helps the students to find out what they know and what they need to learn more about. At the end of the lesson, the trainer repeats the quiz and gives the correct answers. Doing the quiz again helps the students to see how much they have learnt.

Most teaching sessions last about 5 hours, including breaks. Plan regular breaks, with refreshments, every 2 hours.

For example, if the session starts in the morning:

- Ask students to arrive at 8.30 am. Students should start by answering the quiz.
- Start the lesson at 9.00 am.
- Break at 11.00 am for 15-30 minutes for refreshments.
- Start to teach again at 11. 30 am.
- Finish the lesson at 1.30 pm.

Teaching methods

We learn by hearing, seeing and doing - especially by doing. We also learn by repeating things. Remember the saying 'If I hear I forget, if I see I remember, if I do I know'.

The lessons use different teaching methods that involve hearing, seeing and doing. These methods include role plays, demonstrations, discussions and examination of patients. You do not have to use the methods suggested in the manual. The book *Helping Health Workers Learn* by David Werner and Bill Bower has many other good ideas about other teaching methods. If you try a different teaching method and it works well, please write and tell the authors: Dr Keith Birrell, Dr Ginny Birrell and Dr Ian Cross .
c/o keithandginnybirrell@gmail.com

Encourage students to ask questions during the lesson. Make sure students are not embarrassed about giving the wrong answer. Make sure that all students are involved, not just one or two talkative ones.

How to use the posters Before each lesson, write the number and title of each poster on a very large sheet of paper or a flip-chart. The lessons use three types of poster:

POSTER:
(Prepared poster)

1 Prepared poster: You can complete these posters before the lesson. The information for the posters is given in the text.

POSTER:
(Student answer poster)

2 Student answer poster: These are posters which you complete during the lesson with the participation of students. Summarise the students' correct answers on the poster as they call them out. After the students have finished giving you their answers, tell them any answers they have missed. Add the summary words for the missing answers to the poster. You can use pencil to write the summary words of the correct answers in small letters on the poster before the lesson to remind you. The summary words you need are written in the text in **bold** or are presented in a table or box.

POSTER:
(Summary poster)

3 Summary poster: You will complete these posters yourself during the lesson as you teach. You can use pencil to write the summary words of the correct answers in small letters on the poster before the lesson to remind you. The summary words you need are written in the text in **bold**.

How to use this manual

For example, if we ask you to summarise these sentences about feeding children:

Breastfeed children until they reach **2 years** of age. Never **use a bottle** to feed children. Bottles are very difficult to clean. The bacteria in bottles cause diarrhoea. Diarrhoea can kill children. **Use a cup and spoon** to give fluids.

Write only the important summary words in bold on the poster:

Breastfeed until 2 years
Never use a bottle
Use a cup and a spoon

Follow-up

After each lesson, the trainer should observe each student at work in their health centre, or practising with patients. Repeat advice about how to diagnose and treat patients. Remind the student of what they learned in the classroom.

Write down three things they do well and three things they could do better. Discuss these things with the student. Praise them when they do something well. Show them how to improve. Tell the student that the next time you visit the health centre, you will look to see if they have improved.

If a student has problems, the trainer can role-play a patient who has an illness: tell the student what they would find if they examined such a patient. Then, help the student to ask the correct questions and to do a good examination. Ask them what illness the patient has and what the treatment is for the illness. Help them to give the correct answer. If a student is learning very slowly, there is usually a good reason. Ask them what the problem is and help them to overcome it.

Guidelines for students

If you are a health worker or a student, you can study this manual on your own and learn at your own speed. Learning will be easier if you work with an experienced prescriber. This prescriber will be your 'trainer'. Ask them to watch your work, to tell you what you do well and to correct your mistakes. You can also discuss the questions and information in the manual with other health workers and help each other to learn.

Planning your learning

The course has 15 lessons. Try to do one lesson each month. Use the new knowledge and new skills in your work after each lesson. If you do not understand something, write it down. Ask another health worker to help you and to answer your questions. Do not be afraid to admit that you do not know something.

Start by doing the quiz at the start of each lesson. The quiz will show you what you know and do not know. Do the quiz again at the end of the lesson, to see how much your knowledge has

improved. Act out the demonstrations and role plays together with other students or health workers in your health centre. Discuss the examples of patients with your colleagues before looking at the answers. If you think a table or diagram is useful, draw it and put it on the wall in your health centre so you can refer to it. Before you start the next lesson, try to answer the quiz from the last lesson. If many of your answers are not correct, perhaps you need to read that lesson again.

Chapter 2 Triage

Recognising really ill patients

Treatment for very severe febrile diseases

BEFORE THE LESSON

- Teach students in small groups to make sure that each student understands this important subject.
- Give each student a copy of this chapter to read before the lesson.
- Give each student a copy of Appendix 4. (How to give diazepam rectally.)
- If there is no malaria in your area, cross out the box in this chapter about malaria treatment.

Triage

Triage is a process for identifying sick patients. It is about sorting patients, not treating them. In a busy clinic, if patients are not triaged, they may become more sick, or die, while waiting to be seen. Triage lets you know who you should treat first. It is important that your patients understand that there is a process. They should be aware that they may have to wait longer in the queue if they are not a priority case.

You can teach and explain the basics of triage to your staff. The staff do not have to have a clinical background. The only way to implement the triage system is to work with your staff at the front desk. It can be done without any tools. However, if available, provide them with a digital thermometer and an oxygen saturation probe.

It is common for patients arriving at clinic to have measurements done by non-medical staff. Agree with your team what measurements and details should be recorded on each patient's record card. For example you might include name, gender, age, occupation, village, HIV status, temperature, pulse rate, oxygen saturation, weight and even blood pressure. In areas where TB is common you could include some simple questions to pick up TB. For example: have you had a cough for more than 2 weeks? Have you noticed that you are more sweaty than usual at night or lost weight? Have you or anyone in your family had TB?

A good system of triage is the traffic light system. Your patients can be sorted into three groups. The assessment should follow the **A**irway and **B**reathing, **C**irculation, **D**isability and **O**ther approach.

RED for danger: Emergency signs present. Immediate assessment and treatment

AMBER warning: Priority signs. Urgent review. Place at the front of the queue

GREEN is good: Non-urgent. Stable and wait in queue

Airway and breathing

Weak or absent breathing

Obstructed breathing

Cyanosis (this means that the patient might look blue in the mouth) (Saturation less than 90% or visibly blue)

Severe respiratory distress

Wheezing (with no red features)

Saturation 91-94%

Circulation

Capillary refill time greater than 3 seconds (cold hands and feet)
Weak or fast pulse
Heavy bleeding
Heart rate (pulse) less than 50, or higher than 150
Vomits everything or severe diarrhoea
Unable to feed or drink
Very pale (no red features)
Bleeding (not severe, no red features)
Recent fainting

Disability

Active convulsions
Reduced conscious level (unresponsive or only responsive to pain)
High fever (higher than 39 degrees celsius)
Severe pain
Acute general weakness

Other

Acute severe trauma
Ingestion of poisonous substance
Snake bite
Acute chest pain or abdominal pain (if greater than 50 years of age)
Open fracture
Visible new limb deformity
Sick infant less than 2 months old

Your staff will become more confident with this process over time. They will be able to make faster assessments. It is important to ensure that the staff remain in the same post for long enough to allow them to improve their skills. Every few weeks, spend some time with the staff as they are doing triage. Check their knowledge and skills.

Recognising really ill patients: General danger signs

The triage chapter teaches recognition of serious illness. If the patient has any of the following general danger signs you should treat them as if they have a very severe febrile disease. Febrile means having a fever (a temperature above 37.5 in the ear).

There are four general danger signs:

1. The patient is unconscious, or lethargic (does not appear to notice what is going on around him even if someone talks or makes a noise), despite being awake.
2. The patient has had a convulsion (also called a fit or a seizure).
3. The patient has vomited four times or more in the last few hours (eg this morning).
4. The patient is not able to drink or breastfeed and has not passed urine in the last 12 hours.

A patient with any of these four general danger signs may be very ill. He may have severe malaria, pneumonia, sepsis or meningitis. Severe malaria, pneumonia and meningitis are very severe febrile diseases. These illnesses usually cause a fever (a temperature above 37.5 in the ear).

If a patient has a general danger sign, you will often start treatment before taking a full history. Treat them immediately for a very severe febrile disease and send them straight to hospital.

Treatment for very severe febrile diseases

1. If the patient has vomited, clear their mouth with your finger. Lay them on their side.
2. If the patient has fever, check the temperature with a thermometer. If the fever is confirmed: take them to a warm room and remove their clothes. Wipe them with a warm, wet cloth to cool them. This is called tepid sponging.
3. If the patient is having a convulsion, give them diazepam rectally (see Appendix 4). Repeat the dose of diazepam if the patient is still having a convulsion 10 minutes after taking the first dose. Diazepam dosages are shown in Table 1.

TABLE 1 Doses of diazepam

Age	Dose
Up to 1 year	2.5mg
1-3 years	5mg
4 years or more	10mg

4. To prevent low blood sugar:
 - If a patient under 2 years can breastfeed, ask the mother to breastfeed.
 - If the patient is not able to breastfeed but can drink, use a cup and spoon to give him expressed breastmilk, or a breastmilk substitute or sugar water. Give 30-50 ml of milk or sugar water (all ages). To make sugar water, mix four level teaspoons (20 g) of sugar with a cup (200 ml) of clean water.
 - If the patient is unable to drink, and you know how to use a nasogastric tube, give 50 ml of milk or sugar water by nasogastric tube.
5. Test for malaria in areas where malaria exists, or in returned travellers, if possible. If the malaria test is positive, or if no test is available in an area where malaria is common, give artesunate into a muscle (or a vein if you have been trained), 2.4 mg/kg/dose for an adult, or 3mg/kg/dose for children less than 20kg. Where intramuscular artesunate is not available use intramuscular artemether or, if that is not available, use intramuscular quinine. All intramuscular injections should be given in the lateral thigh (see appendix 3). Buttock injections carry an unacceptable risk of nerve damage and abscess.

6. Treat the patient for suspected sepsis. These are the options:			
Antibiotic	Dose	Repeat	Consider: (Depending on national policy)
Ceftriaxone	50 mg/kg up to 2 g intramuscularly	Daily	No need to add gentamicin
Chloramphenicol Not suitable if pregnant, breast feeding or less than 1 month old	40 mg/kg Intravenously	Repeat four times a day in hospital	Add Gentamicin intramuscularly 2.5 mg/kg 240 mg for an adult Daily
Benzylpenicillin	0.1 million IU/kg (same as 60mg/kg) Intramuscularly	Repeat four times a day if patient unable to get to hospital	
Benzathine benzylpenicillin	50 000 IU /kg (same as 37.5mg/kg) up to 2.4 million IU (same as 1.8 g) intramuscularly	Weekly (rare to need more than one dose)	
Procaine penicillin fortified	0.1 million IU/kg (same as 100mg/kg) intramuscularly	Daily	

7. After initial treatment. Ask the questions that are relevant below.

Then send the patient to hospital immediately. Carry him flat so that his head is at the same level as his legs. Write down what treatment you have given the patient on his record card. Metronidazole (for anaerobic infections such as pelvic inflammatory disease) or ciprofloxacin (for atypical infections including typhoid) may be added to the treatment when the patient is in hospital.

Infection risk to healthcare workers and patients

There are simple things that you can do to protect you and your patients from diseases that can be passed between you:

- Ask all patients with a cough, sneeze or a runny nose to wear a mask if they are inside or sitting within 2 metres of others at the clinic.
- If you have a cough, sneeze or a runny nose you should wear a mask. You may choose to wear a mask even if you don't have any of these symptoms.
- Wear gloves when doing any intimate examinations (also use a chaperone) or if you are cleaning or dressing a wound or performing any sort of operation. Aprons or surgical scrubs may be used to protect your own clothing.
- Consider greeting patients with a fist bump rather than a handshake, if it is culturally appropriate. This is more hygienic than a hand shake.

Chapter 3 How to take a patient's history

BEFORE THE LESSON

- Remember to teach each student individually to make sure that each student understands this important subject.
- Give each student a copy of this chapter to read before the lesson.
- Give each student a copy of Appendix 4. (How to give diazepam rectally.)
- If there is no malaria in your area: malaria only needs to be considered in returned travellers.

Start by explaining the information below to the student. Then, see patients together with each student. Show the student how to take a patient's history. Ask the student to practise talking to patients while you watch. Tell the student what they do correctly. Show the student how to improve. Do not expect the student to understand all the answers that the patient gives. Tell the student what the diagnosis is and how to treat the patient.

You do not have much time with each patient. Sometimes you may have less than 10 minutes to decide what illness the patient has and what treatment to prescribe. In this time, you must also give the patient advice to help them to use their medicine correctly and to help them stay healthy.

To diagnose and treat patients you need to:

1. ask the patient the correct questions
2. examine the correct parts of the patient
3. make sure that the patient will use the medicine correctly and follow your advice.

This lesson teaches you how to ask the right questions. This is called taking a history. Before you learn how to take a history, you need to know how to recognise and treat really ill patients. Chapter 2 teaches you that. General danger signs suggest that the patient may have a very severe febrile disease. Chapter 2 tells you how to treat patients who may have a very severe febrile disease.

Taking a history

There are nine important steps in taking a history. If the patient answers 'Yes' to any of the questions, you need to ask more questions after you have finished taking the basic history. The boxes tell you what extra questions you need to ask, or which Lesson or Appendix will tell you more about the illness.

The nine steps are:

1. **Greet the patient and check their identity.** (Check the date of birth and ask what they prefer to be called for example.) Rather than shaking their hand it may be culturally acceptable to greet with a fist bump. This is more hygienic than a hand shake.
2. **Ask the patient what they would like to talk about.**

This will normally take less than 30 seconds. Do not interrupt them until they have talked for about one minute. Check there is nothing else.

For example ask: **"Was there anything else important today?"**

How to take a patient's history

If the patient has an obvious common or important problem, ask the more detailed questions in step 3, then follow the advice given in the appropriate lesson.

For all patients do steps 4, 5, 6, 7, 8 and 9.

3. Ask the patient more detailed questions about their symptoms.

- When did your symptoms start?
- Have you had a fever?

You will learn about fever in Lesson 3.

- Have you had any convulsions? (Convulsions are also called fits.)

Convulsions are a general danger sign. Treat the patient for very severe febrile disease and send them to hospital immediately. You will learn about convulsions in Lesson 3 .

- Do you have a cough? Do you have difficult breathing?

If the patient has a cough or difficult breathing, follow the instructions in Appendix 1 or Appendix 2. You will learn about cough and difficult breathing in Lesson 2.

- Do you have problems with eating or drinking? Have you vomited?

If the patient is not able to eat or drink, they may be very ill. This is a general danger sign. Treat the patient for very severe febrile disease and send them to hospital immediately.

If the patient has vomited, ask them how many times they have vomited that morning. If the patient has vomited two or three times, treat them for the illness at the health centre and ask them to wait for 30 minutes. This is so you can make sure that they do not vomit up the medicine you have given them. If the patient has vomited four times or more that morning, treat them for a very severe febrile disease.

- Do you have diarrhoea? Do you have blood in your faeces? Or abdominal pain?

If the patient has diarrhoea or blood in the faeces, follow the instructions for treating diarrhoea in Appendix 10 and for treating a patient with blood in the faeces in Appendix 18. You will learn about diarrhoea in Lesson 6 and about abdominal problems in Lesson 8.

If the patient has pain in the abdomen, or blood in the faeces, they may have an abdominal problem. Follow the instructions for diagnosing and treating abdominal problems in Appendix 18.

- What medicines have you used in the last 2 weeks?

This question is very important, especially if you think the patient may have malaria. To decide about treatment for malaria, you need to know if the patient has taken any malaria medicines already. The patient may experience symptoms or side effects caused by medications or herbal/ traditional treatments.

4. Ask the patient about the what the symptoms, or the problems, are stopping them from doing.

- What effect, or impact, is this problem having on the way that you lead your life?
- When relevant ask about smoking, alcohol intake, sexual practices, occupation and activities.
- It is important to know if a women of child bearing age might be pregnant. Ask her when her last period was and whether it was normal.
- In areas where HIV is common ask when the patient last had an HIV test and if the test was positive. Offer an HIV test if they have not had a test in the last 3 months and they might be at risk.

5 Examine the patient.

Feel the patient's forehead for a fever, or check the temperature. Look for anaemia on the inside of the patient's lower eyelid.

6. Check the growth chart if the patient is a child aged 5 years or less. Make sure young children have had all their **vaccinations**.

7. In malaria areas or returned travellers.

Test for malaria if has had a fever, or muscle soreness, or a headache. These symptoms suggest that malaria is possible.

8. Write up your notes. Summarise what you have found. This will help you to decide what is wrong with the patient and how to treat the patient.

For example:

Name and age: Chandan Patel. age 4 years

History: Fever for 3 days, vomited one time

Examination: Fever, pale, no fast breathing, growing well. 17 kg.

Investigations: Malaria rapid diagnostic test (RDT) please

Diagnosis: Possible Malaria and anaemia

Treatment: If RDT positive:

Artemether+lumefantrine 20mg+120mg twice daily for 3 days then review

Safety netted for general danger signs

If RDT is negative treat for possible Hookworm with albendazole 400mg one dose in clinic and then ferrous sulphate 1/2 tab x1-2/day for at least a month

9. Give the patient (or relative) a safety net. Tell them to come back if the patient fails to get better after the expected time to recover, or if they get a general danger sign. Tell them what the general danger signs are and ask them to repeat what you have told them. Even better: write the general danger signs down.

If you do not know what the diagnosis is:

- send the patient to hospital if they are very ill
- ask the patient to come back on another day if they are not very ill. Time will often help you to make a diagnosis.

You will learn how to make sure that the patient takes the medicine correctly and follows your advice in the next chapter.

Pain

Pain is a common symptom that may be the reason for patients coming to see you. When you ask what other symptoms are affecting a patient, pain may give you clue as to what type of illness they have. Most of the lessons in Diagnosis and Treatment will mention pain. Pain can affect any part of the body and pain can both cause emotional health problems and result from an emotional health problem. The type of pain that a patient has, for example a crushing pain or a burning pain can suggest a heart attack or nerve pain respectively. Also the location of the pain and whether the pain is constant or intermittent - see the Abdominal problems lesson - will suggest what is causing the pain as will what factors bring on the pain or relieve the pain.

You should always try to diagnose the cause of pain. Particularly when pain can suggest a serious illness such as malaria, meningitis or pneumonia. It is always preferable to treat the cause of the pain, rather than just giving painkiller medicines. Even when people can afford to use 2 medicines - one to treat the cause of the pain and one to treat the pain itself - it can be confusing for patients to take more than one medicine. And all medicines have some risk of unwanted symptoms or even definite harms.

For example ibuprofen and aspirin (Non Steroidal Anti-Inflammatories or NSAIDs) can be dangerous for people to use long term, especially if they have high blood pressure, diabetes, previous peptic ulcers, kidney problems. They should not be used for patients with Dengue fever or chickenpox. It is important to know what medication patients are using so that you can warn them about the risks and to give you a chance to recommend a safer option of managing pain. Many muscular pains for example are better managed by stretches, exercises or treatments applied to the skin over the muscle or joint. Ibuprofen cream for example is much safer than taking ibuprofen tablets, and it is often just as effective.

Paracetamol is very dangerous to the liver when taken in overdose. Amitriptyline is dangerous to the heart if taken in overdose but can be particularly useful with nerve pain or pain that stops you from sleeping.

Chapter 4 Communication

BEFORE THE LESSON

- Remember to teach each student individually to make sure each student understands this important subject.
- Give each student a copy of this chapter and ask them to read it before the lesson.

Start by explaining the information below to the student. Then, see patients together with each student. Show the student how to communicate with patients. Ask the student to practise talking to patients while you watch. Tell the student what she does correctly. Show her how to improve. Tell the student what the diagnosis is and how to treat the patient. Make sure that the student follows the seven rules of communication.

Primary health care workers can only help patients to get better and to stay well if they can communicate.

The health worker must be able to communicate with a patient so that:

- the patient can explain what is wrong
- the patient understands the questions the health worker is asking him and the health worker can learn what the problem is
- the patient understands what his illness is and what caused it
- the patient knows how to use his medicine correctly and how to stay well.

To be a good communicator, a health worker needs to ask questions and to listen carefully. He must also use simple language and explain things clearly. Avoid giving too much information at once. Check that the patient understands your advice.

To help you remember, use the seven rules of good communication each time you see a patient:

1. **Respect privacy**

See patients in a quiet, private place. Patients find it easier to talk if they are not worried about someone else listening to what they say. This helps the patient to give you better information so you can make a better diagnosis. It also helps the patient to understand what you tell him about the treatment.

2. **Use simple language**

You should use simple, clear language that the patient understands. Use local words and avoid medical terms. If the patient does not understand, he may become confused or may not follow your advice.

3. **Give enough time**

Give the patient enough time to explain his problems. If you do not give enough time to hear the patient's history, you will not know what is wrong or how to treat him. If you do not listen, the patient may ignore your advice.

4. Show interest

Show the patient that you are interested in his problem. If the patient thinks that you are interested, he is more likely to trust your advice. Use ways of showing interest that are acceptable in your culture. For example, sit close to the patient and look at them while you are speaking. Do **not** sit on the other side of a table from them.

5. Explain

Explain to the patient what you think the problem is. Explain the treatment. Tell him how long it will take to get well. Explain when he should come back to the health centre. Tell the patient to return if they don't get better after the expected time, or if certain danger symptoms develop.

6. Give one medicine

Explain to the patient how to take the medicine. Try to only give the patient one medicine when possible. If a patient has too many medicines to take, he may forget your advice or get confused. If the patient does not need any medicine, tell him why (see also Rational Prescribing in Lesson 1). If the patient has more than one illness, treat the most important illness first. Explain to the patient that they need to come back for treatment for his other illnesses.

7. Check understanding

Make sure that the patient fully understands their illness and the treatment. Ask the patient to repeat what you have told them. Correct anything which they have not understood correctly.

Chapter 5 Shared decision making

BEFORE THE LESSON

- Remember to teach each student individually to make sure that each student understands this important subject.
- Give each student a copy of this chapter and ask them to read it before the lesson.

Start by explaining the information below to the student. Then, see patients together with each student. Show the student how to talk with patients. Share decisions with patients. Ask the student to practise talking to patients while you watch. Tell the student what she does correctly. Show her how to improve.

Patient centred care and shared decision making are closely linked.

The days of going to see a health care worker and expecting to be told what to do are numbered. Every patient has choices. There are almost always options. The decisions that are made are no longer made by health care workers without patient input.

The history that you take from a patient will help you to make some educated guesses about which treatment options might suit them.

- Show interest. Listen. You need to know what the patient believes before you can even consider trying to dispel any myths or false beliefs.
- Try to understand what the patient does at work and at home, and how the illness impacts upon that. Their activities may even have caused the illness. These factors may influence what treatment might work for the individual.
- Most patients come in with at least a thought of what might be wrong. Find out what this is. At the end of the consultation you may agree with them, or explain why you don't agree.
- Many patients will be worried that a symptom could mean something drastic. If you don't address this worst fear the patient will not be able to work with you on the reality.
- When you agree on a probable diagnosis with a patient: ask what they would like to know, so that they are in a position to decide, with your support, what to do next.
- Knowing about the patient's background, occupation, beliefs and fears will put you in a good position to guess what treatment options might work for them. Offer choices when available, but be prepared to advise why each choice might not work well for this individual. Emphasise the potential benefits of each viable choice.

First do no harm:

- Some medications are particularly dangerous for certain patients. For example: patients with high blood pressure, diabetes or peptic ulcer disease should not regularly take ibuprofen or diclofenac. This family of anti-inflammatory tablets (NSAIDs) can irritate the stomach and cause dangerous bleeding from inside the bowel. NSAIDs also put the blood pressure up, cause kidney damage, heart attacks or strokes, especially if used for a long time. Many of these medications are available over the counter and we should guide some patients to avoid such medications.

Shared decision-making

- Your job may be made more difficult by shortages of medicines, investigations and treatment options. Share your own uncertainties with your colleagues in advance of a more informed conversation with the patient. You may not have this luxury in an emergency. You are more likely to be more doctor centred in your decision making in an emergency. When there is no emergency you should share decisions with patients when possible. Remember that it is ultimately the patient's decision how to treat their illness but try to put them in a position to make an informed decision, with your support.

Invite your student(s) to share examples of shared decision making that they have already seen. Many students will have experience of this as a patient, relative or student. Perhaps ask them for situations where shared decision making was not used when it might have been. Add examples of your own where it has been appropriate for you to share decisions with your own patients.

Examples of shared decision making in low income countries:

- Isaac, a muslim gentleman declined to be given an injection of gentamicin to treat his gonorrhoea. Oral ciprofloxacin was out of stock from our clinic pharmacy. I gave him a single dose of azithromycin in the clinic to treat possible chlamydia. Having worked in a predominately Muslim country previously, I thought that this gentleman might have misunderstood what his Imam had told him. But he was fixed in the belief that he could not have an injection. Isaac was happy to buy ciprofloxacin from a local private pharmacy. He knows to come back after 2 weeks if his symptoms have not settled. He initially did not want to let his wife know about his gonorrhoea but he was happy to advise that his casual partner get treatment. Our specialist nurse managed to persuade him that his wife needed treatment to avoid his own re-infection and harm to his wife. He was willing to have another HIV test after 2 months.
- Lucy was agitated and not sleeping. In all probability she has bipolar disorder. She admitted to being stressed by family issues. Family and personal illness have been a trigger. She was over confident and had pressure of speech (talking fast). There was a suggestion of paranoid thought patterns. The first time I saw Lucy she was too agitated to sit and wait to be seen. I sought support from a trusted friend of hers to get her back into the clinic and to build a trusting relationship. Our conversations focused on what I might be able to do to help her to sleep and to help her cope with stress. Lucy chose a small dose of antipsychotic medication (haloperidol) at night to allow her to sleep and to feel calm enough for her to concentrate on dealing with her health issues and family stress. Our shared plan is to use this medication for as short a period as possible.
- Lucy later decided with my support to take a small dose of carbamazepine to stabilise her mood to prevent her mood becoming too high or too low. Lucy knows about the tiny risk of carbamazepine affecting her immune system and knows to come back urgently if she has symptoms that might be caused by an infection.
- Daniel sustained a nasty left ring finger injury. The finger bones were badly crushed. The finger was almost severed and there was a high risk of bone infection or amputation.

Daniel's job and home-life involved a lot of manual work. Being able to use his hands was important to him. Daniel declined the option of amputating much of the finger. He preferred to have the finger stitched back together, to take a prolonged course of antibiotics and to have a longish period of rehabilitation to get the finger and hand working again. He understood that the end of the finger might need to be amputated if the blood supply did not survive or if the infection was unmanageable.

- Kumwenda presented with symptoms that might mean an early COVID-19 infection. We did not have access to PCR tests. She was happy to watch and wait for more worrying symptoms, but to also return on day 2 of the illness to have a lateral flow test done at a time when the test is much more reliable (sensitive). In the mean time she decided not to work face to face with clients and to self isolate until she got the result of the test.
- Precious presented with heart failure at the age of 4 months. Her mum was very poor. There was no local expert in cardiology to guide her care. Mum agreed to try some medicines to help with her symptoms, without the usual blood tests and scans. She was unable to travel for tests. She knew that not having those tests made planning Precious' care more risky. I somehow managed to scan Precious' heart but I didn't have the expertise to understand what the pictures meant. I sent the pictures to a colleague with mum's consent. I monitored Precious' care with expert advice given by this distant colleague. Precious' mum was happy for us to minimise travel to experts at distant clinics.
- Kennedy had blood in his urine. He lives in an area where there has been bilharzia (schistosomiasis haematobium). Our laboratory microscope was broken and we had no tests to confirm the diagnosis. Kennedy knew that bad reactions to praziquantel are very rare and that it is usually effective in killing the adult parasites. He also knew that he might continue to pass blood in his urine for a few weeks. He also knew to return if he was vomiting or unwell, for example with a fever. I planned to see Kennedy after 3 months to test his urine.
- Max had had 3 grand mal seizures (generalised seizures) followed by post-ictal periods (after a seizure people can be drowsy or disorientated for 5-30 minutes). He has not been a drinker (alcohol) and had no fever, or signs of any other illness. I told Max that he almost certainly had epilepsy. I offered him a choice of treatments. He was not keen on the possibility of being drowsy or sedated with medication, even if the medicine was only to be taken at night. He had young children in his house. I offered him a medication called carbamazepine. Carbamazepine at low doses has a small risk of causing nasty sores in the mouth, or a rash. Carbamazepine can very rarely affect the immune system and potentially make him more prone to serious infections. Max was keen to stop the convulsions so that he might be able to drive again in the future. He accepted the small risk of side effects and he knew to come to clinic urgently if he had a fever or a severe sore throat.
- Alice and Janet had scabies. They were 5 year old twins. They came from a big family of 8. No one else had symptoms of scabies. The clinic only had 2 bottles of benzyl benzoate left. I told mum that they would both need to be treated twice. Usually we would suggest that the whole family should be treated at the same time to avoid re-infestation with the scabies

mite. Mum could not afford to buy more medicine from the local private pharmacy. We agreed to treat both girls and also to treat mum who had the most direct contact with the girls. I went through where and how to apply the emulsion in detail. Mum knew that the rash would probably remain for 2 weeks even after successful treatment. But she would come back if the rash was not better after 3 weeks. Mum was happy not to use any medication to treat the symptoms of the rash knowing that they should be better after 2 weeks. Sometimes the itch after scabies can last for up to 4 weeks.

- Suleiman is 54. He had had his blood pressure checked 3 times. On average his blood pressure was 164/104. He had no chest pain on exertion, nor pain in his calves (lower legs) when he walked. He had no family history of early heart attacks or strokes (in siblings or parents less than 60 years olds). He did not smoke or drink alcohol. He had no protein, glucose or blood in his urine. His blood creatinine test was normal (and his kidney and bladder ultrasound was also normal). He weighed 94 kg and was 175 cm tall. His heart sounds were normal, his pulse was regular and the back of his eyes looked normal (his retinas) (most clinicians find looking at the back of the eye too difficult). His future 10 year risk of having either a heart attack or a stroke was 7%. I told him that if 100 men like him took a blood pressure tablet at this stage for the next 10 years, 2 people out of those 100 would avoid having a heart attack or stroke during that time. Hearing this Suleiman decided not to take any blood pressure tablets just yet. Suleiman asked for my help to lose weight through healthy eating and my help to get him more active. We think that these 2 changes together might prevent 4 people like him in a 100 from having a heart attack or stroke in the next 10 years. I gave him some homework and we agreed to meet after a week to work together to see how he could achieve that with the support of my team. alpha.patientcentre.org has a toolkit called *Reduce my chance of heart attack and stroke* that makes it easy for patients and clinicians to understand these numbers by using pictures of smiley and sad faces.
- Suleiman's brother Othuman had just been diagnosed with Type 2 diabetes. He was very unhappy with his weight (he weighed 97kg and was 173cm tall) and he knew that diabetes was dangerous for his eyesight. He worked as a guide and his eyesight was very important. He wanted to know how he might make his diabetes go away. I advised him to consider all of his options at another appointment, since diabetes is linked to a high risk of future heart attacks and strokes. I promised to look at all the options together with him to minimise his future risk of heart attack and stroke. I advised him that if we could bring his weight down by 15-20% (14-19kg) that there was a 86% chance that his diabetes would go into remission (be cured). We also spoke about him perhaps taking a medication called metformin before meals to help him with his sugar levels and perhaps with his appetite.

Shared decision making does not need to happen in a single appointment. You may wish to give the patient some homework to allow them to understand their choices better. Then the patient, with the support of the health care team and the patient's family, or friends, can make decisions that best suit the patient. Resources for shared decision making will be available via www.patientcentre.org

Chapter 6 Lifestyle medicine

BEFORE THE LESSON

- Remember to teach small groups of students to make sure that each student understands this important subject.
- Give each student a copy of this chapter and ask them to read it before the lesson.
- Share local examples of the lifestyle options that are available to manage illnesses that are common or important. We give some examples from practice in Zambia and Tanzania below.

Start by explaining the information below to the student. Then, see patients together with each student. Show the student how to talk with patients. Lifestyle medicine is an extension of shared decision making. Ask the student to practise talking to patients while you watch. Tell the student what she does correctly. Show her how to improve.

Lifestyle medicine highlights that the way that people lead their lives affects their health as much as, and often more than, medication can. In many countries medication is often not available to treat some illnesses. When this happens lifestyle changes might be the only way to improve peoples quality of life or life expectancy.

Here are some example questions and answers:

I've just been diagnosed with type 2 diabetes. I am overweight. My clinician tells me that if I lose a little weight that my diabetes symptoms will improve and if I lose 15kg of my weight healthily my diabetes will almost certainly go away. How might I lose weight with healthy lifestyle measures?

- There are options of healthy diet that make weight loss much easier.
- One example is the low GI diet. Low Glycaemic Index (GI) foods release energy into the blood stream more slowly. This keeps you full for longer and prevents your blood level from going so high.
- Two other examples that are proven to be healthy for the heart are the Mediterranean diet (whole grains, fruits, vegetables, seafood, beans and nuts) and the DASH (Dietary Approaches to Stop Hypertension) diet.
- A diet high in protein and low in carbohydrates is effective to help weight loss because it makes you feel full for longer.
- Moving more and sitting less will protect your heart and will also help you to lose weight. For example walking for 90-150 minutes per week or running/ cycling for 75 minutes per week. Thirty minutes of High Intensity Interval Training (HIIT) and 10 minutes of strength training per week are an alternative.

My clinician says that I have sleep apnoea syndrome. I stop breathing at night and fall asleep a lot during the day. What can I do that doesn't involve wearing special equipment at night?

- Hazardous and harmful drinking of alcohol makes sleep apnoea much worse. Drinking less than 14 units of alcohol per week and less than 4 units in any day improves symptoms of sleep apnoea and makes weight loss easier.
- Losing as little as 5kg of weight, if you are overweight, will improve or cure sleep apnoea symptoms.
- Sleep apnoea is a common cause of heart attacks and strokes in people who are overweight. Treatment can lower your relative risk of heart attacks etc by more than 50%.

My brother tells me that my behaviour is affected by my alcohol consumption. I keep having arguments with my family. My wife has threatening to divorce me unless I drink sensibly. How can I drink safely?

- If you are currently drinking harmfully it may be dangerous to stop drinking suddenly. If in doubt half your alcohol consumption each week.
- Some people are addicted to alcohol. If you think you may be addicted you will need probably help from an expert to stop drinking completely.
- One option is to drink less than 14 units of alcohol per week and to not drink more than 4 units in any day. This would also mean avoiding local alcoholic drinks where it is impossible to know how much alcohol there is in a bottle. Spirits contain a lot of alcohol in a small volume and can encourage people to drink too much alcohol. For example a miniature bottle of spirits (50ml) is usually 2 units. Many shop bought drinks will tell you how much alcohol there is in a bottle.
- Find out how much alcohol there is in the drinks that you drink. For example a bottle of beer that is 4% alcohol comes in bottles that contain 375ml. This is 1.2 units. There are usually 9 units in a 750ml bottle of wine and 1.5 units in a 125ml glass. There are 40 units of alcohol in a 1 litre bottle of spirits (or 28 units in a 700ml bottle).

I have trouble getting off to sleep and I am not keen to take medication. What might help me get off to sleep and to sleep better?

- Avoid drinking alcohol to get off to sleep. It causes poor quality, un-refreshing sleep and sleep apnoea symptoms.
- Sleep hygiene measures help. One example is to take exercise early in the day. Avoid caffeinated drinks such as coffee and tea in the afternoon and evening. Avoid smoking or eating in the late evening. Relaxation techniques and sleep cognitive behavioural therapy (SCBT) work for many too.

What lifestyle options are available to Martin? Martin has high blood pressure.

- Martin is 64. He had had his blood pressure checked 3 times. On average his blood pressure was 160/100. He had no chest pain on exertion, nor pain in his calves (lower legs) when he walked. His father had an early heart attacks (less than 60 years olds). He does not smoke or drink alcohol. He had no protein, glucose or blood in his urine and his kidney and bladder ultrasound was normal. He weighed 94 kg and was 175 cm tall. His heart sounds were normal, his pulse was regular and the back of his eyes looked normal (his retinas). His future 10 year risk of having either a heart attack or a stroke was 10%.
- We told Martin that if 100 men like him took a blood pressure tablet at this stage for the next 10 years, 3 people out of those 100 would avoid having a heart attack or stroke during that time. Hearing this Martin decided not to take any blood pressure tablets just yet.
- Martin asked for my help to lose weight through healthy eating and my help to get him more active.
- We would expect that a healthy diet (eg the Mediterranean diet or the low GI diet) might prevent 3 people like him in a 100 from having a heart attack or stroke in the next 10 years. An important part of a healthy diet is drinking a safe amount of alcohol. 14 units of alcohol or less.
- We would expect that regular physical activity might prevent 3 people like him in a 100 from having a heart attack or stroke in the next 10 years.

Lifestyle medicine

- We think that these 2 changes together might prevent 5 or 6 people like him in a 100 from having a heart attack or stroke in the next 10 years.
- There are several ways to achieve both a healthy diet and a healthy amount of activity. Some homework to share the options available is a good start. Martin might need some support to achieve both of these changes.

I get headaches regularly. What might be causing them? How might I make them less severe and less frequent?

- Make sure that there is no suggestion of serious illness. Fever, dehydration or serious infections often causes a headache. Severe high blood pressure occasionally causes headache.
- If there is a new problem with waking in the night with a headache or vomiting, or if the person is disorientated or unconscious the headache is likely to have a serious cause.
- Check there is no tooth, ear or neck problem.
- If the headache is one sided, and throbbing with nausea or vomiting with a history of similar headaches with a sensitivity to noise and light the person is likely to be having migraine headaches
- If the headache is generalised, feels like a band around the head, and happens when the person is stressed or emotional, it is likely that these are tension or muscular headaches.
- Lifestyle changes can make both migraine and tension type headaches much less likely. It is often worth keeping a headache diary to understand what the triggers might be for these types of headache.
- Avoiding unhealthy amounts of alcohol, eating healthy foods and avoiding known triggers are all important. Healthy sleep hygiene is important too. If the person wants to break a pattern of poor sleep and regular headaches it may be worth taking amitriptyline 5-25 mg at night (starting with a low dose to minimise unwanted symptoms such as a dry mouth or drowsiness in the morning).
- An example of a treatment for a migraine headache is ibuprofen (400 mg for an adult). An example of treatment for a tension headache is paracetamol (1 g for an adult). Relaxation techniques and lying in a dark room will help both too.

I get palpitations. What might they be caused by? What can I do to feel better?

- Tell your clinician what you mean by palpitations and beat out the rhythm (how fast, irregular, extra beats). What do you think brings the palpitations on and how do they make you feel? Do you faint or find that you can't do normal activities when they happen. How often do they happen and for how long?
- Your clinician will check your pulse and your blood pressure. They will listen to your heart and check for anaemia and thyroid problems. They may even be able to do an ECG heart tracing.
- If you get tingling in the fingers or lips your palpitations are likely to be linked with anxiety. Talk to your clinician about what you can do to help with your anxiety.
- Extra beats or strong beats are also common and are not likely to be caused by anything worrying. Make sure that you drink enough water. You should also drink less caffeinated drinks (and less alcohol if relevant).

I think I might be addicted to alcohol. What can I do about it?

- Addiction happens when a behaviour takes too much of your time, thoughts and energy. Addiction is when a behaviour becomes unhealthy. Some behaviours are always unhealthy, like smoking or substance misuse. Alcohol can sometimes be used safely.
- Several things may make you think that you are becoming addicted to alcohol:
 - If you stop drinking for 2 or 3 days and feel really unwell, anxious or shaky. You may even see visions such as small creatures, or have a fit or a convulsion. This is called delirium tremens or the DTs. This is caused by a physical addiction to alcohol and can be treated by slowly halving the amount of alcohol drunk each week until a safe consumption is achieved. For many people who have experienced the DTs, the only safe alcohol consumption is none at all.
 - Any addictive behaviour can affect your relationship with other people. If you find that you are getting angry with people, or having arguments, it may be because your drinking habits are becoming harmful.
 - If you are having accidents, having money problems, or even getting into trouble with the police you may be drinking harmfully.
 - Alcohol generally makes anxiety worse. It also causes a bad sleep pattern, makes sleep apnoea worse and makes people's mood worse. If you suffer from any emotional health problem and drink more than 10-14 units of alcohol per week, that amount of alcohol is likely to make your emotional health worse.
 - It is harmful to drink more than 35 units of alcohol in a week.
 - It is hazardous to drink more than 14 units of alcohol in a week.
- Being aware that you are drinking in a hazardous or harmful way, or knowing that you are addicted to alcohol is a big step. Sharing this information with family members, friends and medical staff is the first step to successfully dealing with an unhealthy habit or addiction.
- There are a number of activities, talking therapies and medications that can help with alcohol misuse and addiction.
- Making a plan that involves your clinician, family or friends is really helpful. You may need support to make a worthwhile change to your habits. It is usually helpful to look at your lifestyle and see what positive changes that you can make to help you to feel better and to behave positively.

More examples here?

- [More answers here.](#)

Chapter 7 Sexual and adolescent health

BEFORE THE LESSON

- Ask each student to write down their questions about sexual health, menstrual health, family planning, sexual abuse and equality before the start of the lesson. Give them examples if they are struggling for ideas.
- You will need support from a local leader with knowledge of protecting young people from abuse, including sexual abuse, at this lesson.
- It may be culturally appropriate in your area for learners to be one gender per lesson.
- Below you will find some example questions and answers. These are the sort of questions from learners and answers from experts that are useful to improve knowledge and awareness. This type of question and answer group is useful to promote positive attitudes to sexual and emotional health.
- Give each expert participant a copy of this chapter and ask them to read it before the lesson.
- The lesson might take 2 hours.

Here are some example questions and answers:

What should I do if I find out that someone is being sexually abused?

- Believe them. Support them. Seek their consent to take action on their behalf. Taking action will protect the person and also the community. The appropriate action may depend on the organisations in your community that are able to take action to protect individuals. Your social leaders will guide you regarding how to approach this in your community.

What should my clinician do if I have experienced sexual violence?

- Start post exposure prophylaxis of HIV if seen within 72 hours.
- Give post coital contraception.
- Offer prevention of sexually transmitted infections: a single dose of azithromycin 2 g orally and ceftriaxone injection into the thigh (500 mg).
- Tetanus vaccination, especially if there are any open wounds.
- Hepatitis B vaccination (accelerated schedule).
- Counselling, support and any emotional health treatment

What do you think about masturbation?

- Different cultures have different attitudes to masturbation. Even in a long term relationship partners can have different attitudes to masturbation. Masturbation may help people though a long period of sexual abstinence. At least masturbation does not expose you to a risk of HIV or any sexually transmissible infection.

How can I protect a friend who is HIV positive from being bullied?

- Do not accept negative attitudes to long term health conditions or diversity. Report negative behaviours to social leaders. Encourage your friends to take action too.

What can we do to allow women to function whilst they are having their period?

- Periods are normal and should not stop you from working or playing.
- Brightly coloured washable pads are discrete and reusable. They soak up vaginal bleeding and allow you to be active and sociable during your period.

- Periods can sometimes be painful or heavy.
- If you might want to become pregnant: If you are not allergic to ibuprofen you can take 400mg three times a day (after food) on the day you expect your period and until the period is expected to be less painful or lighter. This method is suitable for you if you might want to become pregnant. Alternatively you can take tranexamic acid 1g three times a day when menstruation has started, for up to 4 days.
- If you don't want to become pregnant. The combined pill is suitable for women under the age of 50. If you have migraine headaches with aura, or if the pill makes your migraines worse, it should be stopped at the end of 21 days and swapped for another form of contraception. You should not use the pill if you have had breast cancer or a clot (a deep vein thrombosis for example).

What choices do I have to protect me from contracting HIV and other sexually transmissible infections?

- Waiting until you and your partner are ready to have sex together. For many this means both having an HIV test before starting a sexual relationship. Remember that it can take up to 3 months before HIV shows on a blood test after infection.
- Condoms give good (but not perfect) protection against sexually transmissible infections (including HIV) and getting pregnant. They must be put on before sexual penetration.
- Circumcision offers some protection against becoming infected with HIV. It also offers some protection against other sexually transmissible infections. Condoms are much more effective at preventing HIV and other sexually transmissible diseases but condoms must be used consistently. Circumcision is safe with excellent long term satisfaction results from men.

What choices do I have to prevent me from becoming pregnant?

- Condoms give good (but not perfect) protection against sexually transmissible infections (including HIV) and getting pregnant. They must be put on before sexual penetration.
- The contraceptive injection (progesterone - given every 8 or 12 weeks) prevents almost all pregnancies as long as you get your injections within the recommended time limit. Some women tend to find that it can stimulate their appetite and cause them to gain weight. Many women find that after 3 injections, their periods stop. But they usually restart about 6 months after the last injection.
- The contraceptive implant requires a very minor procedure and is placed on the inside of your upper arm under local anaesthetic. It lasts for 5 years. It provides excellent contraception but does not tend to help painful or heavy periods and can lead to irregular vaginal bleeding.
- The intrauterine system (for example Mirena) is excellent for managing heavy or painful periods and it provides excellent contraception. It requires a minor procedure and is put in via your vagina.
- The combined pill (for example Microgynon) is not suitable for women who are over the age of 50, women who have clots or a high risk of clots (for example a personal history of - or a close family history of - deep vein thrombosis or a pulmonary embolus), women who have had breast cancer, or for women whose migraines get worse with the pill. This is a method that relies on you remembering to take the pill regularly. It provides excellent period control, making periods lighter and less painful.
- The progesterone only pill (for example Cerazette) is taken every single day. It is extremely safe and has little in the way of side effects. But some women can have light irregular vaginal bleeding at inconvenient times. Other women stop having their periods and others find that their periods are unchanged by this pill. This is a method that relies on you remembering to take the pill regularly.

I have become pregnant (possibly through rape or abuse), is it possible to have a termination?

- Yes. It is important that you seek support from a health practitioner as early as possible.

My brother goes to school but my family can't afford to send me too. Is there any way that I can go to school?

- Schooling can be expensive. It may not be possible for your parents to afford to send all of their children to school, even if the children want to go to school. There are organisations that can help to ensure that your opportunities for getting education are similar regardless of your gender. Ask a social leader for more information.

Can I catch syphilis from a toilet seat?

- No. There is no evidence that any sexually transmissible infection can be caught from a toilet seat.

Can a girl get pregnant if she uses a condom or takes the pill?

- Unfortunately, both of these methods of contraception depend on the correct usage of the method. Condoms can rip (pregnancy rate 2 % in one year, if used consistently). Women can miss pills and some medical problems can cause failure (eg diarrhoea, vomiting, some medications) (pregnancy rate 1-9 % in one year).

Is it OK to have sex before marriage?

- Right, or wrong, sex happens outside of marriage. Only have sex when it feels right for you. That will usually be in a loving relationship. Be aware that it is very difficult for you to know for sure that your partner does not have a sexually transmissible infection including HIV.
- For many this means both having an HIV test before starting a sexual relationship, Remember that it can take up to 3 months before HIV shows on a blood test after infection. Condoms can give you good protection from HIV, and other sexually transmissible infections, if used consistently.

Can I get advice from the clinic without my parents permission?

- Yes, in most countries you are able to see a clinician without your parents permission. Although your clinician will often encourage you to discuss your actions with a parent. You must be able to demonstrate that you understand the options available to you in the clinic.

How do I stop bullying?

- Be aware what bullying is. This includes spoken and written words, physical violence, and emotional actions. Talk about bullying with your peers and teachers.
- Report bullying behaviour to your parents, relatives and social leaders.

I have a sore on, or discharge from, my private parts (penis or vagina). What should I do?

- These are sometimes symptoms and signs of sexually transmissible infections. You should see a clinician to get treatment and your partner should also get treatment. Sores might be caused by herpes or by syphilis. Discharge might be caused by gonorrhoea or chlamydia. If your partner has symptoms and you do not, you should both receive treatment. Consider also having a test for HIV. HIV can take up to 3 months after infection to show in a test. HIV is often asymptomatic.

I am a boy or a man. Should I get circumcised?

- Male circumcision offers some protection against becoming infected with HIV. It also offers some protection against other sexually transmissible infections. Condoms are much more effective at preventing HIV and other sexually transmissible diseases but condoms must be used consistently. Circumcision is safe with excellent long term satisfaction results for men.

I'm very shy. Is there anything that I can do?

- Your parents, your aunt or uncle or a trusted teacher might be good people to help you. Shyness is much more common than you would imagine. Shyness is natural but it can sometimes stop you from enjoying life. Perhaps you need some support the first time that you do a new thing?

I am sad and I don't have any support. Who can help me?

- Some people say that you can't be happy unless you can be sad at times. All of us face challenges and need support at times. Your parents, relatives and friends will usually support you when you are sad or you face a challenge. Your community leaders can also help. Find out from others who you can trust to support you locally.

When should I get married?

- The age of legal marriage varies according to your country. In most countries these days you will not get married until you feel ready to be married.

My friends all drink alcohol but I'm not interested. How can I avoid drinking harmfully?

- There is a lot of social pressure to drink alcohol. You should make your own choices. But it sometimes takes a lot of personal strength to say no when your peers are drinking and encouraging you to drink too. More than 14 units of alcohol a week is hazardous and more than 35 units of alcohol per week is harmful drinking. Binge drinking is hazardous too. 6 units of alcohol counts as a binge. People who have had experience of the harm that alcohol can cause amongst their family and friends are often able to share tips on how to drink safely.

My parents smoke. I want them to stop. It is affecting their health and I am worried that I will lose them. What can I or they do to help them to stop?

- Smokers die on average 10 years earlier than non smokers. It is never too late to stop smoking when it comes to improving your life expectancy. But smoking is addictive and your parents may need help to stop smoking. There are several options for helping your parents to stop smoking, but first of all they need to be motivated to stop. Cytisine seems the most effective aid to stopping smoking. It is cost effective and safe. Temporary adverse effects include nausea, vomiting and sleep disturbance. Some people find nicotine replacement helpful.

My friend has an older boyfriend who gives her presents and money. Is she being sensible?

- No. This is likely to be a form of prostitution unless the relationship is truly based on mutual love and respect.

My teacher expects me to sleep with him to pass my exams. What should I do?

- This is sexual abuse. You are not likely to be the first person that your teacher has abused. You would be at risk of contracting HIV and other sexually transmissible infections. Seek support from a social leader to help you to take appropriate action to protect yourself and other students.

My boyfriend is controlling my behaviour. What should I do?

- Share your concerns with a friend or a family member.
- Consider leaving the relationship and how you might do this safely in an emergency.
- This type of behaviour may go along with physical, sexual or verbal abuse. Consider asking a social leader for guidance.

My brother has a knife. He takes it with him when he goes into town. Can I do anything? I am worried for him and other people.

- Although your brother may feel safer carrying a knife for personal protection, in reality he is making himself a target for others who want to prove themselves. Your brother is almost certainly at a higher risk of harm when carrying a knife. If your brother won't listen to this argument: you may wish to share your dilemma with a social leader.

My friend wants us to smoke cannabis. Should I give it a go?

- Cannabis can make people paranoid and unwell. It can sometimes lead to long term psychiatric conditions like psychosis. Smoking cannabis causes lung cancer and other physical illnesses. Make your own choices. Do not feel under peer pressure to do what other people are doing.

My parents have bought CBD oil because they read that it might help with long term pain. Are they being deceived?

- CBD oil, and other CBD preparations, are not first-line, evidence-based treatment options for pain, or for any other condition. For many they work as a placebo. It is hard to know what you are buying because in many countries CBD production is not regulated.

I lost a pregnancy recently (or I had a termination of pregnancy recently). I don't feel well. Should I go to the clinic or get support?

- If you have a fever, excessive vaginal bleeding (blood soaks through your pads consistently), or have lower abdominal cramps that are not made better with ibuprofen (400-600mg three times a day) - see a clinician urgently. It is fairly normal to experience fairly heavy bleeding and cramps for up to 6 days after the procedure, or the loss of the pregnancy.
- You may have been advised not to have sexual intercourse (or use tampons) until 2 weeks after a termination of pregnancy.
- Start contraceptive protection on the day of the termination of pregnancy if you want to avoid pregnancy at this time.
- You may need emotional support. This is usually available from your clinician or from a close friend or relative.

My friend became pregnant recently. She has been in a relationship with an older man. Neither of them want the child. Should I go to the clinic or get support? Should my friend think about a medical termination?

- Your friend sounds vulnerable and needs support. There is usually a social leader in your community who can support your friend to make difficult decisions. The clinic is also often a good place to start.

Should my friend think about a medical termination? Is terminating a pregnancy legal?

- Adoption or medical termination may be acceptable for your friend and in your society. These are difficult decisions and it is important to help your friend to be safe.
- The following may apply depending on the law or practices in your country:
 - Medical termination for any reason is totally prohibited.
 - Medical termination may be used if it is life-saving.
 - Medical termination may be used if the pregnancy was conceived due to rape or incest.
 - Medical termination may be used for socio-economic reasons.
 - Medical termination is available with no restrictions.
 - There may be limits in the use of medical termination depending on the gestation of the pregnancy
- For example in the following African countries (check as the information below may now be out of date):
 - In countries such as Angola, Congo (Democratic Republic and the Republic of Congo), Egypt, Gabon, Guinea-Bissau, Madagascar, Mauritania and Senegal, medical termination of pregnancy is totally prohibited, with no exceptions.
 - Some countries allow medical termination to save the life of the woman, such as Cote d'Ivoire, Libya, Malawi, Nigeria, South Sudan, Tanzania, Uganda.
 - Medical termination of pregnancy may be allowed when a woman has been raped, or in cases of incest in some countries including Mali and Sudan.

Sexual and adolescent health

- Other countries allow medical terminations to preserve physical or mental health, such as Botswana, Gambia, Ghana, Mozambique, Sierra Leone, Eswatini, with Zambia. This includes terminations for socio-economic reasons.
- In Cape Verde, South Africa and Tunisia, there are no restrictions.

Is medical termination safe? Will having a medical termination affect my health and fertility in the future?

- Medical termination supervised by a trained health worker is much safer than "surgical" procedures performed by untrained people. Medical termination is safer than continuing the pregnancy.
- In Africa, about 10% of maternal deaths are caused by unsafe terminations. The most common complications are incomplete abortion, haemorrhage and infection.
- Terminations do not increase the risk of infertility or cancer. Women with pre-existing mental health problems may find that a termination makes their mental health worse.

What does having a medical termination involve? Is it painful? Will I bleed a lot? (The details of the medicines used should probably not be shared with non clinicians.)

- The first step is counselling to ensure that a termination is what the woman wants, and that she is not being forced.
- The regimen may differ between countries. The woman should take Mifepristone (the dose depends on the length of the pregnancy) by mouth to end foetal growth. One or two days later, Misoprostol (800 micrograms) is put into the vagina (or under the tongue) to expel the foetus.
- It is important to know the date of her last menstrual period. If this was less than 10 weeks ago, most women will miscarry within six hours. If the pregnancy is more advanced, additional doses of Misoprostol may be needed (400 micrograms every three hours until expulsion).
- You may experience more pain and heavier bleeding than is normal for your menstrual bleed, but the pain usually responds to paracetamol. It may be possible to see products of conception (the foetus and placenta) on the pad. About 0.1% (one in a thousand) of women will suffer from severe bleeding or infection from retained products of conception.

What happens if medical terminations fail?

- If the pregnancy is in the first trimester (up to 13 weeks), the foetus will not be expelled in about 7% of women, who will then need surgery to empty the uterus. When the pregnancy has advanced further (between 13 and 24 weeks) about 13% of women will need surgery.

When can a woman start to use contraception after a medical termination?

- To avoid another unwanted pregnancy, a woman can have a depot Progesterone (DMPA) injection when she has taken the first tablets. Alternatively she could have an intrauterine contraceptive device fitted after the foetus has been passed. Other contraceptive choices are described in this chapter.

My aunt died whilst trying to give birth a few years ago. The midwife said that her genital surgery was probably the cause of her obstructed labour. Our culture encourages women to have genital surgery, but I am scared. What should I do? My mother says that if I don't get cut, I might not be able to marry and my friends could reject me.

- Female genital mutilation (FGM) is practiced in many African countries. In recent years, new laws have been introduced. However, despite this the practice continues. It is seen in West Africa (particularly, but not exclusively, in The Gambia, Mali, Burkina Faso, Guinea, Sierra Leone and Liberia) and the north east (Egypt, Sudan, Eritrea, Ethiopia, Djibouti and Somalia). Some communities think that FGM is part of their culture and it is done as a rite of passage to becoming woman, ready for marriage.

- There are different forms of FGM, from clitoridectomy (removing just the clitoris) to excising the clitoris, inner and sometimes external labia, to infibulation where the vulva is stitched up to make entrance to the vagina narrower.
- No religions advocate FGM and there are no health benefits. On the contrary, there are serious medical and psychological consequences of FGM, such as infection, fistula formation, complications in childbirth, infertility and even death. A fistula is an abnormal tunnel between parts of the body, for example between the bowel and the vagina - this would cause stool (poo) to come out of the vagina.
- Some women may choose to have these traditional operations but it is important that all women be told how likely it is that they might suffer from these horrible and often dangerous complications.
- Many of these operations prevent women from being able to enjoy sexual intercourse. The operations do not make sexual intercourse more enjoyable for their sexual partners.
- Some health workers try to minimise the harm caused by some of these genital operations by providing clean razor blades, gauze and antiseptic to reduce the risk of infection.
- Traditional birth attendants and midwives should be shown and taught about the complications of genital operations.
- Should young women be free to decide what happens to their bodies even though there are pressures to do what others have done in the past?

Is it safe to use sildenafil to improve my erections?

- Yes. The maximum dose is 100 mg in any 24 hour period. Higher doses may cause some facial flushing or headache, but they are safe. The lowest effective dose should be taken by mouth about an hour before sexual contact. The tablet will not cause an erection without sexual excitement, and the erection will go away after ejaculation. The benefit can last for up to 6 hours after taking the tablet. If a faster onset of action is wanted, it is possible to chew the tablet and then put it under the tongue. Some of the sildenafil will be absorbed through the gums, some will be swallowed.

Chapter 8 Preventing cancer and finding cancer early

BEFORE THE LESSON

- Remember to teach small groups of students to make sure that each student understands this important subject.
- Consider giving each student a copy of this chapter and asking them to read it before the lesson.

Ask the students to think about how it might be possible to prevent cancer before the lesson. Tell them to give you some questions about preventing cancer before the lesson.

This lesson might take the format of questions and answers. Consider inviting another clinician to teach this lesson with you.

Here are some example questions and answers. Research answers to the questions that your students give you before the lesson:

What causes cervical cancer?

- The Human Papilloma Virus or HPV is a viral infection, which is transmitted by sexual contact. HPV causes 90% of cervical cancer. However most women who get infected with HPV do not get cervical cancer. Their immune system fights against the virus and kills the virus. Persistent HPV infection of the cervix is the main cause of cervical cancer.

What can be done to pick up cervical cancer early and to treat it before it does any harm?

- Cervical screening picks up cancer at a very early stage, when the early cancer is only on the cervix. At this point the cancer cells can be removed without an operation. The procedure is simple and involves burning off the area of the cervix that is affected.
- Cervical screening is offered to sexually active women. The majority have a screening test done every three years. Those living with HIV have a screening test every two years.
- When available women are tested for HPV infection. This involves the woman taking a swab from their own vagina, which is then tested for the presence of the HPV virus. When this test is negative the woman needs no further examination on this occasion.
- The next part of cervical screening is then done on women who currently have HPV (the vaginal swab is positive). Or when the HPV test is not available, all women will have an examination done by a female clinician in a discrete environment.
- A speculum is passed into the vagina and a small amount of vinegar (acetic acid) is dabbed onto the cervix. The vinegar highlights which areas of the cervix might have pre-cancerous changes.
- If more than 75% of the cervical os is affected, then the cervix is treated with LEEP (loop electrosurgical excision procedure). Smaller areas are treated with local cautery.

What can be done to prevent cervical cancer?

- In most areas of Zambia young girls are offered HPV vaccination before they have had sexual contact. This is usually 2 vaccines a year apart. This is not currently offered to young boys. It is very rare for men to get penile cancer, but men certainly spread the HPV infection. In fact 50% of the population will get the type of HPV (mostly 16 and 18) that can very occasionally cause cervical and penile cancer at some time in their lives. Most people get rid of the infection quite quickly and it never causes cervical cancer or penile cancer. Circumcision protects against the spread of both HPV and HIV.
- The HPV vaccination prevents 90% of cervical cancer. The HPV vaccine is sometimes also offered to women older than 14. It is safe and often effective to have the HPV vaccines even after a woman has started having sexual intercourse.

How will I know if I might have cervical cancer?

- Cervical cancer usually presents with bleeding after intercourse or persistent bleeding between periods.

Can anything else make cervical cancer more likely?

- Both cervical cancer and breast cancer are more common in families and are made more common by smoking.
- HIV, when untreated makes cervical cancer more likely.

Is it possible to prevent breast cancer?

- Breast cancer is a common form of cancer that is more common in some families and is more common when your waistline is big. Having extra fat around your middle (an increase waist circumference to height ratio - above 0.5) increases the risk of breast cancer by a factor of 1.5. So reducing your waistline will protect against breast cancer.
- Stopping smoking prevents many types of cancer including breast cancer and will lengthen your life by 7-13 years on average.
- There is no Zambian screening programme for breast cancer and there is no vaccine against breast cancer.
- Breast cancer can be caused by a faulty gene. There is no test for this gene in Zambia at present. The gene accounts for less than 10% of all breast cancers.
- Self examination of your breast is worthwhile. We suggest using a flat palm to examine and don't pinch the breast tissue. Look for changes that are new to you. Perhaps in the middle of your menstrual cycle. New lumps that are growing, skin dimpling, nipple changes or bloody discharge should make you see a clinician.

Will safe sex protect me from cancer?

- Using condoms regularly, male circumcision, monogamous sex all protect you from sexually transmissible infections.
- Not sharing needles and getting all of your recommended vaccinations protects you against infections including HIV, hepatitis B and hepatitis C and HPV. These infections are linked with cancer.

What lifestyle measures should I take to protect me from cancer?

- Avoiding or quitting smoking and tobacco use will mean that you are unlikely to get lung, throat, mouth, pancreatic or bladder cancer.
- Drinking alcohol sensibly, or not at all, will reduce your chance of getting liver, breast or bowel cancer.
- Eating a healthy diet that includes fruits, vegetables, whole grains, beans, nuts, legumes and pulses will protect you from bowel and stomach cancers. Avoid cured and processed meats.
- Avoid your waistline being too big. Aim for a waist to height ratio between 0.4 and 0.5. This means that your waist measurement (just above your belly button) should be less than half of your height. This will protect you from breast, prostate, endometrial and kidney cancer. Healthy eating plans and moving more and sitting less will help you to keep your waistline healthy.
- Sitting less and moving more protects you from breast, bowel and endometrial cancers.

What symptoms might suggest cancer? Is it possible to find some cancers before they become impossible to cure?

- If you have blood in your stool (faeces or poo), particularly if it continues for more than a few days. This has many causes. But bowel cancer is one cause of rectal bleeding.
- If you have a cough for more than 2-3 weeks that isn't improving or if you are losing weight without trying you might have tuberculosis or lung cancer.
- Unusual vaginal bleeding (after intercourse, between periods or after menopause) is occasionally caused by cervical or uterine cancer.
- Visible blood in the urine is more likely to be caused by schistosomiasis in Zambia but in older people or those who smoke bladder cancer is a possible cause.
- Difficulty swallowing, especially when solid food seems to catch as it goes down the gullet can be caused by oesophageal (gullet) cancer.

- Non healing sores in the mouth or a persistently hoarse voice can be caused by mouth or throat cancer.
- Persistent sweats at night, bruising, swollen lymph nodes can be caused by blood cancers (leukaemia or lymphomas).
- A new breast lump that is growing, skin dimpling, nipple changes or bloody discharge should make you see a clinician.
- If your symptoms last for more than a few weeks, worsen with time or you have unexplained weight loss or fatigue it is worth considering cancer as a cause.
- Many types of cancer can be cured if we pick up the symptoms early. Cervical cancer and many types of cancer are curable if picked up early.

PART 2 The lessons

Lesson 1 Rational prescribing

BEFORE THE LESSON

- There are three posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared poster: 2
Student answer posters: 1 and 3
- Give each student a pen and a notebook.
- Choose five students to help you with the demonstrations. Give them copies of the demonstrations and practise with them before the lesson.
- Ask the students to read Chapter 4. "How to take a history."
- Prepare one copy of the questions for the practical activity in section 3 for every five students. If you have 20 students, you will need four copies of the questions.
- Ask the students to look at Appendix 31 A list of medicines and their uses.

Lesson plan

1 A story

Demonstrations: Rational prescribing

2 Do patients take their medicine?

3 Practical - Deciding on the best treatment for patients

Start by reading the story in section 1 to the students.

SECTION 1: A story

This is a story about Baki, the health assistant in the village of Bilaelimu. Baki has never been trained to diagnose and treat illnesses, but he lives in the village and cares about the health of its people. Baki's story and the story of some of his patients will teach you how to choose the correct medicine for your patients and how to avoid wasting medicines, by prescribing rationally.

First patient

Baki's first patient is Mkulima, a 24-year-old farmer. Mkulima had a cough, but was unable to go to the health centre because he had to plant his fields. He asked his friend to buy him some antibiotics from a shopkeeper.

Ask your students: What are the problems of buying medicines from a shop? Look for the following answers:

- Answer No diagnosis is made, so the patient may be treated for the wrong illness. No advice is given about how to take the medicine.
- Answer The patient receives the wrong medicine.
- Answer The wrong dose of medicine is used.
- Answer The patient uses the medicine for the wrong length of time.

Mkulima had an upper respiratory infection. Upper respiratory infections are usually caused by viruses and get better without medicine. However, the shopkeeper gave Mkulima an antibiotic called co-trimoxazole. Antibiotics are *only* used to treat illnesses caused by bacteria.

Co-trimoxazole can sometimes cause side effects, including a painful mouth and eyes. (Side effects are unwanted effects caused by medicines.) Unfortunately, this happened to Mkulima after he had taken the medicine for 2 days. He should stop taking the medicine.

Ask your students: What medicines can cause side effects? Which side effects have you seen or heard of? Look for the following answers:

Answer Antibiotics are commonly used medicines that can cause side effects. These side effects include skin rashes, diarrhoea and nausea.

Answer All medicines sometimes cause side effects. Only give a medicine if it is more likely to help the patient than to harm him.

POSTER 1:
(Student answer poster)

Answer

Answer

Answer

Patient advice

Ask the students: What advice can you give a patient so that he will be happy if you do not give him medicines?

Teach the patient **about** his **illness**. Tell him that he will get better without using medicine. Tell him that using the **wrong medicine may make** him very **ill**. The wrong medicine may kill him.

Give advice to encourage healthy practices: eat a **mixed diet**, drink **clean water** and **wash hands** after going to the toilet and before preparing food.

Tell him how to avoid catching infectious diseases.

Second patient

A mother brings her 11 month old son, Surua, to see Baki. Surua has had a cough and fever for 5 days. Baki notices a slightly raised rash on Surua's face and neck. Surua's mother tells Baki that this rash appeared yesterday.

Show the students the picture of a child with measles (Picture 1).



PICTURE 1 A child with measles

Baki asks Surua's mother questions to check for general danger signs. He finds out that Surua has had no convulsions, has not vomited and is able to feed a little. Surua has passed loose faeces three times this morning, but there is no blood in the faeces. Surua has not had any medicine in the last 2 weeks.

Next, Baki examines Surua. He finds that Surua has a fever, but is not anaemic or dehydrated and does not have pneumonia. He notices that Surua has conjunctivitis (an eye infection). Baki tests for malaria. The malaria test is negative

Baki decides that Surua has measles. Unfortunately, Baki does not know about rational prescribing.

He decides to give Surua:

Co-trimoxazole to try to prevent pneumonia

tetracycline eye ointment to treat the conjunctivitis

paracetamol to treat the fever

Ask your students: Can you remember the treatments Baki gave to Surua?

What do you think about the treatment that Baki gave?

Look for the following answers:

Answer Baki gave Surua three different medicines. Surua's mother may not remember how to give Surua all the medicines correctly.

Answer Baki gave Surua two medicines that he does not need. This is wasteful because it means that Baki will not be able to give these medicines to other patients who may need them.

Before Surua and his mother leave the health centre, Baki's new trainer, Mzee, arrives. Mzee is teaching Baki about rational prescribing. He tells Baki what he has done well. Baki has taken a good history, done a good examination and decided on the correct diagnosis of measles and possible malaria. Mzee tells Baki that only two medicines will help Surua get better.

Ask the students to tell you which two medicines are most important for Surua. Help them to give you the following answers:

Answer **Vitamin A**
Vitamin A helps to prevent eye problems and blindness. Patients with measles need extra vitamin A. Vitamin A normally comes in a jelly capsule (200,000 IU each). You can cut the end off the capsule and give drops into a young child's mouth. Surua's dose would be 4 drops each day for 3 days.

Explain to the students why the other medicines are not needed:

Possible answer **Co-trimoxazole**
Patients with measles do sometimes get pneumonia. Antibiotics such as co-trimoxazole can *treat* pneumonia but *will not prevent* pneumonia. Surua does not have pneumonia so he does not need co-trimoxazole.

LESSON 1 Rational prescribing

Possible answer **Tetracycline eye ointment:** measles causes conjunctivitis. But measles is a virus, and tetracycline eye ointment will not cure conjunctivitis if it is caused by a virus.

Possible answer **Paracetamol:** paracetamol is used to treat the *symptoms* of an illness, such as fever, *not the cause* of an illness. Paracetamol can help to reduce fever, but it will not help an illness get better.

Ask the students: What advice can you give to Surua's mother about preventing illness and keeping Surua well? Look for the following answers:

Answer Feeding can help a child to get better more quickly and to stay well. Advise Surua's mother to continue to breastfeed him. Advise her to give him small amounts of a mixed diet five times a day until he is well and for a week after he gets better.

Answer Advise her to mash Surua's food. Sick children find it easier to eat if their food is mashed.

Mzee explains to Baki the difference between symptomatic medicines and curative medicines:

Symptomatic medicines are used to treat symptoms. For example, paracetamol and aspirin are used to reduce pain or fever.

Curative medicines are used to cure an illness. For example, vitamin A cures vitamin A deficiency. Coartem and quinine are examples of medicines that cure malaria.

Mzee is still worried about giving Surua's mother two medicines to use at home. The mother may become confused about how to give each medicine. Mzee advises Baki that he should only give more than one medicine for the patient to take at home if he is sure that the patient knows how to take both medicines.

Mzee and Baki agree to give Surua the first-line malaria treatment and vitamin A. The dose of malaria treatment depends on which drug is used (the national drug policy in each country gives guidelines on first-line malaria treatment). Vitamin A is usually given in three doses, one at the health centre, one the next day and one on day 14. Baki will give Surua the first dose of a malaria treatment and the first dose of vitamin A before he leaves the health centre.

Mzee asks Baki what advice he can give Surua's mother to prevent convulsions. Baki tells him about tepid sponging for fever.

Ask the students to tell you what tepid sponging is. Look for the following answers:

Answer To tepid sponge: The carer takes the child to a warm room and removes the child's clothes. She puts a cloth in some slightly warm water and wipes the child's whole body so that it is wet.

Answer She repeats this until the fever has gone. This will take less than 30 minutes. Tepid sponging can prevent a child from having convulsions and it can make a child with a fever feel better. A child who feels better will be more likely to eat or breastfeed.

Demonstrations: Mzee teaches Baki about rational prescribing

Ask one student to play the part of Baki. You will play the part of his trainer Mzee. Baki and Mzee sit together by a table. Ask four other students to play the two patients and the patients' carers. Practise the demonstration before the lesson. The role-players should say their lines slowly in a loud voice so that the other students can hear.

A woman comes in with an 18-month-old girl.

Third patient

Baki: Good morning.
Carer: Good morning.
Baki: Please take a seat.
Carer: Thank you.
Baki: Who is ill today?
Carer: My child Mapafu.
Baki: How old is she?
Carer: 18 months.
Baki: What would you like to talk about today?
Carer: She has had a cough and a fever for 3 days.
Baki: Was there anything else that you wanted to talk about today?
Carer: No, thank you.
Baki: Do you mind me asking what her HIV status is?
Carer: That's fine. She hasn't been exposed to HIV.
Baki: Has she had a convulsion?
Carer: No.
Baki: Is she having problems feeding well or drinking well?
Carer: Yes. She is not feeding well.
Baki: Has she vomited?
Carer: No.
Baki: Does she have diarrhoea?
Carer: No.
Baki: What medicines have you used in the last 2 weeks?
Carer: Only traditional medicine.
Baki: Has she had all her vaccinations?
Carer: Yes.
Baki: May I see her growth chart?
Carer: Here it is.
Baki looks at the growth chart.
Baki: The growth chart shows that Mapafu is growing well.

Mzee now examines Mapafu as he talks to Baki.

LESSON 1 Rational prescribing

Mzee: Mapafu does not have any general danger signs. There is no chest indrawing. She breathes more than 40 times in one minute, but there is no noise when she breathes in and out. Mapafu has a fever. She is not anaemic. Because she has fast breathing, we will treat her for pneumonia. Because she has a fever we should test for malaria. Mapafu's malaria test is negative.

Baki writes a summary of what they have found on the chalkboard:

Name and age: Mapafu, 18 months
History: Fever and cough for 3 days
Examination: Fever, more than 40 breaths in one minute
Investigation: Malaria test negative
Diagnosis: Pneumonia.

Mzee: *You are very good at taking a history. What treatment are you going to use?*

Baki: *I am going to treat Mapafu with Septrin.*

Mzee: *The real name for Septrin is co-trimoxazole. Co-trimoxazole will treat pneumonia. However, I am worried that you call co-trimoxazole by its brand name Septrin. What happens at the end of the month after you have no co-trimoxazole left?*

Baki: *If I have no more medicine, I tell patients what medicine they need to buy.*

Mzee: *Co-trimoxazole is the same medicine as Septrin. Septrin is the manufacturer's name or **brand** name for the medicine. Co-trimoxazole is the medicine's real or **generic** name. Septrin is usually much more expensive than co-trimoxazole. When you prescribe or advise people to buy medicines, you should always use the medicine's generic name and not the brand name.*

Baki: *So, I will treat Mapafu with co-trimoxazole. Not Septrin.*

Mzee: *Very good. That's correct.*

Ask the students to suggest other brand name medicines. Here are some examples of possible answers:

Answer Panadol is a brand name for the generic medicine paracetamol. Panadol costs about two times as much to buy as paracetamol.

Answer Brufen is the brand name for the generic medicine ibuprofen. Brufen costs more than two times as much as ibuprofen.

Fourth patient A carer and her 8-year-old boy come into the room.

Baki: *Good morning.*

Carer: *Good morning.*

Baki: *Please take a seat.*

Carer: *Thank you.*

Baki: *Who is ill today?*

Carer: *My child Upele.*

Baki: How old is he?
Carer: 8 years.
Baki: What would you like to talk about today?
Carer: He has a problem with his skin. It is itchy.
Baki: Was there anything else that you wanted to talk about today?
Carer: No, thank you.
Baki: When did this problem start?
Carer: Two months ago.
Baki: Does he have a fever?
Carer: No.
Baki: Has he had a convulsion?
Carer: No.
Baki: Does he have a cough? Or does he have difficult breathing?
Carer: No.
Baki: Is he having problems feeding well? Is he having problems drinking?
Carer: No.
Baki: Does he have diarrhoea?
Carer: No.
Baki: What medicines has he used in the last 2 weeks?
Carer: None.
Baki: Do you mind me asking if he has ever been exposed to HIV?
Carer: That's fine. No he hasn't.

Baki examines Upele as he talks to Mzee.

Baki: Upele does not have a fever. He is not pale. I think he has scabies.

Baki writes a summary of what he has found on the chalk board:

Name and age: Upele, 8 years
History: Itchy rash for 2 months
Examination: Scaly wrists and between fingers
Diagnosis: Scabies

Mzee: What is the treatment for scabies?

Baki: A course of injections of procaine penicillin fortified.

Mzee: I agree that Upele has scabies. However, **injections and antibiotics are the wrong treatment for scabies**. Antibiotics treat infections caused by bacteria. But scabies is caused by a very small insect that lives under the skin. You should:

- Treat the patient for scabies with benzyl benzoate emulsion.
- If the skin is ulcerated or hot. there is also a bacterial infection. Paint the skin with gentian violet every day for 5 days before giving benzyl benzoate emulsion.
- If a very large area of skin is infected or if the skin is painful when pressed, give the patient a course of co-trimoxazole before giving benzyl benzoate emulsion.

Can you tell me why injections can be dangerous, Baki?

Baki: I've seen quite a few patients with big abscesses that are very difficult to treat.

Mzee: Injections can cause abscesses. Needles that have not been properly sterilised can also give patients serious illnesses like tetanus, HIV or hepatitis. Tablets are much safer than injections.

LESSON 1 Rational prescribing

- Baki: Doctor Mzee, can I ask you what 'rational prescribing' means?
- Mzee: Excellent question! Rational prescribing is what we have been talking about today. It means only prescribing medicine when medicine is needed. It also means giving patients the correct dose of medicine for the correct length of time.
- Baki: So, rational prescribing is giving patients the correct medicine, in the correct dose for the correct length of time, but only if patients need a medicine.
- Mzee: Correct. Can you tell me three ways to make buying medicines cheaper?
- Baki: The first way is to only give patients one medicine. The second is to use the generic medicine instead of a brand name medicine. I am not sure about the third.
- Mzee: The third way is to only give patients medicines which cure illnesses rather than symptomatic medicines, which only help them feel better. Remember.
- Baki: Each time you prescribe a medicine for a patient, you should ask yourself:
- Does the patient need this medicine?
 - Is the dose of the medicine correct?

Tell your students:

If you do not know the correct dose of the medicine, *do not guess*.

Look up the correct dose in the list of medicines and their uses in Appendix 31.

Give each student a copy of Appendix 31.

Refreshment break

SECTION 2: Do patients take their medicine?

Discussion This discussion will help students to think about what patients need to know about their treatment and medicine. Ask the students to tell you what they would do in the following examples.

DISCUSSION 1: You are a 60-year-old man. The doctor has sent you to collect your medicine from the pharmacy. The pharmacy has a small window. It is very noisy in the pharmacy and your hearing is not very good. You cannot hear what the person behind the window is saying. The health worker gives you ten white tablets. What will you do with the medicine after you get home?

Look for the following answers:

Answer You may take the tablets in the way that you think is correct. You may not take the tablets at all because you do not know how many tablets to take or when to take them.

Answer After you feel better, you may stop taking the medicine. Because of this the illness may come back.

The person who gives out medicines must make sure that patients understand how to use their medicines.

What to tell patients

POSTER 2:
(Prepared poster)

Tell the patient:

- what his illness is
- how to take his medicine at home
- when to come back to the health centre.

Ask the patient to repeat what you have told him. Make sure he understands and correct anything he has not understood.

DISCUSSION 2:

You are a 26-year-old mother of five children. Your daughter, who is 4 years old, has pneumonia. The doctor took a history from you and examined your daughter. He told you she has a chest infection. The doctor has given you one medicine. The doctor's assistant tells you to give the girl one tablet three times a day until all the tablets are finished. He also asks you to bring the girl back after 2 days if the girl is not much better. You said that you would give your daughter all the medicine. You give the medicine correctly for 2 days and your daughter starts to feel better.

POSTER 3:
(Student answer poster)

Answer

Answer

Answer

Reasons why patients take their medicine correctly

Ask the students: Will you continue to give her the medicine? Why will you?

You will give her the medicine because the **doctor listened** to what you said about your daughter. You **believe** what the **doctor** said. You believe that the **treatment** will work.

You understood that it is important to **finish all the medicine** even if the girl feels better.

The doctor and the doctor's assistant are good communicators.

SECTION 3: Practical - Deciding on the best treatment for patients

This practical activity helps students to decide on the correct treatment for patients, using the examples below. Ask the students to form small groups of five or six. Give each group a copy of what Baki and Mzee found out about another three patients.

Activity

Ask each group to discuss each patient and to:

- talk about why Baki and Mzee have decided on the diagnosis for each patient
- decide if a patient needs a medicine
- decide what medicine to give, the correct dose and the correct length of time
- decide what advice to give the patient.

Give the students 20 minutes to do this activity.

LESSON 1 Rational prescribing

Patient 1 The first patient is a boy aged 2 years who has fever and cough. He boy looks quite well. He breathes 30 times in one minute. He makes no noise when he breathes in and out. He weighs 12 kg.

Diagnosis: Baki and Mzee decide that he has an upper respiratory infection and possible malaria.

Patient 2 The second patient is a 6-year-old boy who has had diarrhoea for 3 days. He is still able to eat. There is no blood in his faeces. He has no fever. He is not dehydrated.

Diagnosis: Baki and Mzee decide that he has gastroenteritis.

Patient 3 The third patient is a 4-month-old boy who has had a fever since yesterday. Today he had one convulsion that lasted for 15 minutes. He has a high fever and looks ill.

Diagnosis: He has a general danger sign. Baki and Mzee decide that he has a very severe febrile disease, possibly meningitis or cerebral malaria.

Answers

Ask each group of students to give their answers. Praise the students if their answer is a correct treatment that is rational and cheap. If their answers are not correct, tell them what the best answer is and why.

Patient 1 Test for malaria. Teach the carer how to reduce the fever by tepid sponging. She should bring him back to the health centre if he becomes more ill.

Patient 2 Advise the carer to give him plenty of fluids and a mixed diet. He should eat five times a day until he is better and for one week after he is better. She should bring him back to the health centre if he becomes more ill or develops a fever.

Patient 3 The carer should remove the child's clothes and treat the fever by tepid sponging. Give the child 30-50 ml of milk, or sugar water, to prevent low blood sugar. Test for malaria (in malaria areas) and give him an injection of artesunate intramuscularly if positive (or treat if you can not test), and an intramuscular injection of ceftriaxone (or benzylpenicillin and possibly gentamicin). Next, send him to hospital.

Ask each group to present their answers. The class can discuss the answers. Explain the correct answers.

Lesson 2 Chest illnesses

BEFORE THE LESSON

- There are seven posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared posters: 1, 2, 3 and 4
Student answer posters 5, 6 and 7.
- Give each student a copy of Appendix 1, Appendix 2 and Appendix 3.
- Ask three students to act out the demonstration in the section 'Children aged 5 years or less'. Practise with them before the lesson.
- Ask two students to act out the demonstration in the section 'Adult or a child aged 6 years old or more'. Practise with them before the lesson.
- Give each student a copy of Tables 3, 4, 5 and 6.
- Bring a metered-dose inhaler of salbutamol if possible. Also bring a 1-litre plastic bottle and a knife so that you can make a spacer.
- You need to find seven patients with whom the students can practise in section 4. If possible, teach section 4 in a hospital. You can ask patients you have seen in the week before the lesson to come to the class. Patients are often willing to help new doctors to learn. Find three children aged 5 years or less: one with an upper respiratory infection, one with pneumonia and one with asthma. Also find four adults or children aged 6 years or more: one with an upper respiratory infection, one with bronchitis, one with pneumonia, and one with asthma.
- Ask the patients to arrive at 11.00 a.m. Section 4 starts after refreshments at about 11.30 a.m. Tell the patients that they will receive a small payment for coming. Do not forget to bring some money to the lesson.
- You need to ask six students to help you before the lesson and in the practical in section 4. For each of the seven patients you have asked to come to the lesson: write on a piece of paper a list of the symptoms, signs, diagnosis and treatment. Write one piece of paper for each patient. Give one piece of paper to each student and discuss it with them. You can use Appendices 1 and 2 to decide what the diagnosis is and what treatment to give each patient.
- Listen to this podcast about cough created by Professor Bob Mills: <https://podcasters.spotify.com/pod/show/the-virtual-doctors/episodes/Acute-Cough-e2ca7ih> Then listen to this podcast about longer lasting cough: <https://podcasters.spotify.com/pod/show/the-virtual-doctors/episodes/Chronic-Cough-e2ca7ja>

Lesson plan

1 Quiz

2 Diagnosis and management

3 When to send patients to hospital

4 Practical: examining real patients

5 Answers to the quiz

SECTION 1: Quiz

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson

POSTER 1:
(Prepared poster)

1. A patient who is ill may breathe fast. How many breaths in 1 minute is fast breathing:

- for a child under the age of 2 months?
- for a child over 2 months but under a year of age?
- for a child over a year but under 5 years of age?
- for a child 6 years or more but under 12 years of age?
- for an adult?

(continued)

2. What would make you think that a patient has a severe illness which may be pneumonia or asthma?
3. Patients who find it very difficult to breathe have respiratory distress. What would you expect to see when you look at a patient with respiratory distress?
4. Why do some people not like using inhalers?
5. A patient has a cough. She is eating well. She does not have chest in drawing or fast breathing. There is no noise when she breathes in or out. She has a fever. When she coughs there is no pain in the side of her chest. She is not anaemic.
 - What illness(es) does she have?
 - What treatment should you give her?
6. How might you prevent yourself from catching colds, COVID-19 and TB in the clinic?

SECTION 2: **Diagnosis and management**

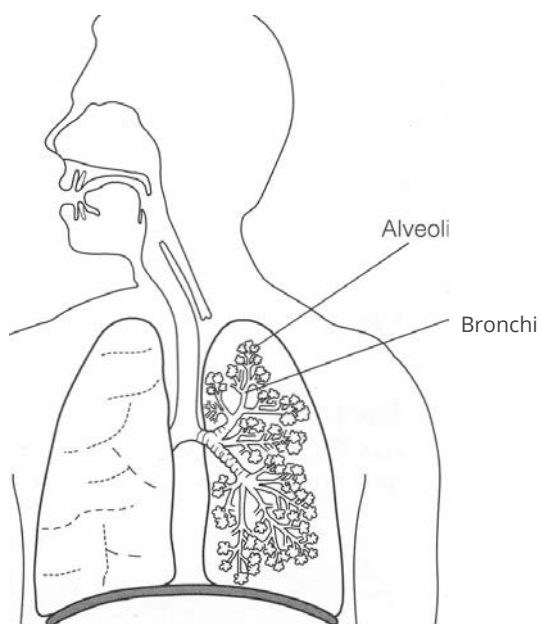
Cough and difficult breathing are the main symptoms of chest problems. Both symptoms can also (less commonly) be caused by heart failure.

In this section, you will teach/learn about chest illnesses and how to diagnose and treat them. Please ask your students to look at appendices 1 and 2 to learn how to look after patients with a cough or difficult breathing.

POSTER 2:
(Prepared poster)

Bronchi and alveoli

Copy Picture 2 onto Poster 2.



PICTURE 2 *Bronchi and alveoli*

Show the students a picture of the bronchi and alveoli and explain:

Two important things in our lungs must work so that we stay well and do not die:

- **Bronchi** - Air must be able to pass down the tubes in our lungs to reach the alveoli. These tubes are called bronchi.
- **Alveoli** - The air in the alveoli must mix with blood. Alveoli are very small air pockets or sacs at the end of each tube.

Chest illnesses

1. Pneumonia

Pneumonia causes the alveoli to fill with fluid. If many alveoli fill with fluid, the patient will become dangerously unwell. Pneumonia is often caused by a bacterial infection. The patient has one, or all, of these symptoms: fever, cough, pain in his ribs when he coughs, and difficult breathing. Pneumonia is made more common by HIV. HIV is linked with Pneumocystis Jirovecii Pneumonia

2. Asthma

Asthma causes the bronchi to become narrow, so air cannot get into the lung easily. The patient has difficult breathing. If the bronchi become very narrow, the patient will become dangerously unwell. A patient with difficult breathing caused by asthma may make a noise when they breathe out. This is called a wheeze. It takes longer to breathe out than to breathe in. People with asthma have wheeze or difficult breathing repeatedly. Smoking, smoke from fires inside houses, other chest illnesses, Non-Steroidal Anti-Inflammatories (NSAIDs), pollen from trees and plants, exercise or anxiety might make a person with asthma wheeze. Sometimes patients who do not have asthma may wheeze. Pneumonia and bronchitis may also cause wheeze. Ascaris (roundworm) and strongyloides can make people wheeze as their larvae migrate through the lungs.

3. Bronchitis

Bronchitis is sometimes caused by a bacterial infection. Almost all patients with bronchitis are aged 13 years or over. A patient with bronchitis has a cough and coughs up sputum for 8 days or more. The sputum may be yellow, green or red. If the sputum is red, the patient may have tuberculosis.

4. Upper respiratory infection

Upper respiratory infections are very common. They are normally caused by viruses. Upper respiratory infections may cause a fever and cough. A patient may cough up sputum that is clear, white, green or yellow. Upper respiratory infections usually get better without medicines. Test for COVID-19 from day 2 onwards. It is very difficult to tell the difference between COVID-19 and any other upper respiratory infection. And the tests for COVID-19 are not perfect.



Viral cough (in measles)

5. COVID-19

Most people who catch COVID-19 have symptoms very similar to an upper respiratory infection, with a cough and /or a fever. They may also lose their sense of smell or taste. People with other long term illnesses, or people who are older than 50, may become very ill in the second, or third week, of a COVID-19 infection if the immune system becomes too active. We suggest that you see these patients again at the beginning of the second week of the illness to check their oxygen saturations if possible. Teach these patients to return urgently if they seem more poorly in the second or third week. It is important to check their oxygen level and respiratory rate. If the oxygen level is less than 92%, or they have fast breathing (consistently more than 25 breaths per minute) they

need urgent steroid treatment and specialist assessment. For these people COVID-19 is very dangerous. Please read appendix 22 to learn more about COVID-19 illness.

Tuberculosis also affects the chest. TB is covered in Lesson 12.

Chest illnesses in children aged 5 years or less

Make sure that each student has a copy of Appendix 1.

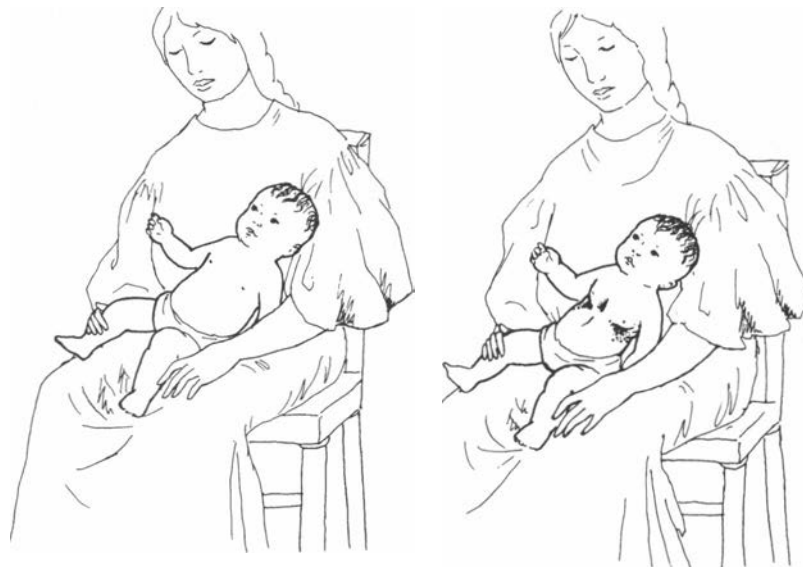
Taking a history and examining the patient Ask the questions in Appendix 1. Make sure that the child does not have a general danger sign. Next, examine the child.

The demonstration that we will now do will tell you how to examine the patient and what to look for.

Ask three students to act out the demonstration as you read it to the class. Ask one student to play the role of the doctor, one to play the carer and a third student to play the child. Ask the students to sit at the front of the classroom. Tell the class who each student is pretending to be.

Demonstration

1. Make sure that the child is not crying or moving when you examine him. If the child is crying, ask the carer to breastfeed him or to hold him close. Do not touch the child yourself yet.
2. Wait until the child is calm. Count how many times he breathes in one minute. This is called the respiratory rate.
3. Ask the carer to lift the child's clothes from his chest. Look below the ribs to see if the skin is pulled in when the child breathes in. This is called chest indrawing. Show the students a picture of a child with chest indrawing.



PICTURE 3 *Chest indrawing*

4. Listen for a noise when the child breathes *in*. If there is a hard noise, this is called stridor. If the child has stridor when he is calm, he may have epiglottitis (see Lesson 14). If this noise came on suddenly in a well child they may have

inhaled a foreign body. Learn how to deal with a choking child in appendix 24. If he has stridor and a fever or cold symptoms give him an intramuscular injection of ceftriaxone (50/mg/kg up to 2g maximum) (or benzylpenicillin). Next, send him to hospital immediately. **Do not put in** a nasogastric tube.

5. Listen for a noise when the child breathes out. If there is a soft whistling noise, or it is difficult for him to breathe out, he has wheeze.

6. Next, check the temperature (or feel the child for fever) and look for anaemia.

Thank the students who acted out the role play.

Diagnosis and treatment

Appendix 1 tells you how to diagnose and treat chest illnesses in children aged 5 years or less.

A severe illness which may be pneumonia or asthma

- If the child has chest indrawing, or looks uncomfortable with fast breathing, he has a severe illness which may be pneumonia or asthma.
- If the child is aged less than 2 months and has stopped feeding well or breathes 60 times or more in one minute, he has a severe illness which may be pneumonia. Children under one year of age do not get asthma.

Give the child an injection of benzylpenicillin. Give 0.1 million IU (60 mg) for each kg of body weight. If the child has a fever, test for malaria or give the first-line malaria treatment in malaria areas. If the child has a wheeze, give a rapid acting bronchodilator. Next, send the child to hospital immediately.

Pneumonia which is not severe

- If a child has fast breathing he probably has pneumonia.
- If he does not have a general danger sign, or a severe illness which may be pneumonia or asthma, the pneumonia is not yet severe.

Fast breathing in children

Copy Table 1 onto Poster 3.

TABLE 1 Fast breathing in children

Age	Child has fast breathing if
Up to 2 months	60 breaths or more in one minute
2 months up to 12 months	50 breaths or more in one minute
12 months up to 5 years	40 breaths or more in one minute

If the child has fast breathing, but looks comfortable, give co-trimoxazole or amoxicillin for 5 days. Teach the carer about home care for a child with a chest illness (see below, page 49). Ask her to bring the child back after 2 days if they have not improved.

If the child has a fever in a malaria area and you cannot test for malaria, give co-trimoxazole. This is because co-trimoxazole can treat both pneumonia and

POSTER 3:
(Prepared poster)

malaria. However, Artemether with Lumefantrine (Coartem) is a far better treatment for malaria if a malaria test is positive.

If, after 2 days, the child has not improved or is worse, give an injection of benzylpenicillin and send him to hospital immediately.

No pneumonia

• Upper respiratory infection

If the child does not have fast breathing, he does not have pneumonia. He probably has an upper respiratory infection. He may have a cough. Do not give an antibiotic. Teach the carer about home care of children with chest illnesses.

• Wheeze

If this is the first time the child has had a wheeze, treat him for pneumonia. If the child has a wheeze and has had wheeze before, he probably has asthma. Treat the wheeze.

• Ear or throat infection

If the child has an ear or throat problem, he may need an antibiotic (see Lesson 14).

• Fever

If the child has a fever and there is malaria in your area, test for malaria.

Chest illness in an adult or a child aged 6 years or more

Make sure each student has a copy of Appendix 2.

Taking a history and examining the patient

Make sure that the patient does not have a general danger sign.

Ask the questions in Appendix 2. Make sure that you also:

1. Ask the patient to cough. When the patient coughs, ask them to tell you if and where this causes pain.
2. Ask a patient who is aged 13 years or more: 'What colour is your sputum?'

Next, examine the patient. Appendix 2 tells you how to examine the patient and what to look for.

Ask two students to act out the following steps as you read them out. Ask one to play the doctor and one to play the patient. Ask the two students to sit at the front of the classroom. Tell the class who each student is pretending to be.

Demonstration

1. Check the temperature (or feel for fever) and look for anaemia.
2. Count how many times she breathes in one minute.
3. Look for chest indrawing.
4. Listen for stridor. If the patient has stridor (a harsh noise when she breathes in), she may have epiglottitis. If she has stridor, give her an intramuscular injection of ceftriaxone (or benzylpenicillin). **Do not put in a nasogastric tube.** Next, send her to hospital immediately.

5. Listen for a wheeze. If the patient has wheeze and their record card tells you that they have asthma, give a rapid acting bronchodilator. Wait 15 minutes. Take a history and examine the patient. Then, treat the patient in the same way as any other patient with a chest illness.

6. If the patient has pain in the side of the chest (ribs) when she coughs, listen carefully to that part of the chest with a stethoscope. If you hear a crackle when she breathes in, she probably has pneumonia.

Diagnosis and treatment

Appendix 2 tells you how to diagnose and treat chest illnesses in patients aged 6 years or more.

A severe illness which may be pneumonia or asthma

- If the patient has a general danger sign, treat her for a very severe febrile disease.
- If the patient has stridor when calm, chest indrawing, looks uncomfortable with fast breathing or has blue lips, she has a severe illness which may be pneumonia.

Give the patient an injection of benzylpenicillin. Give 2 million IU (1200 mg). If the patient has a fever and there is malaria in your area, test for malaria. If the patient has wheeze, give a rapid acting bronchodilator. Next, send the patient to hospital immediately.

Pneumonia which is not severe

- If a patient has fast breathing and fever, she probably has pneumonia.
- If she has crackles in her lungs, she probably has pneumonia.

Give the patient amoxicillin or co-trimoxazole for 5 days. Tell the patient to come back to the health centre after 2 days, or before 2 days if she becomes more ill. If she is no better or gets worse, give her an injection of benzylpenicillin and send her to hospital immediately. If the patient's breathing is then slower but she has a fever, test her for malaria in malaria areas. If a patient with known, or suspected, HIV has rapid breathing, dry cough worse on exercise (possibly also weight loss, or night sweats), he may have PCP pneumonia. High dose co-trimoxazole for 3 weeks is worth considering (see the HIV lesson).

Fast breathing in patients over 6 years old

Copy Table 2 onto Poster 4.

TABLE 2 Fast breathing in patients over 6 years

Age	The patient has fast breathing if
6 years up to 12 years	30 breaths or more in one minute
13 years or more	25 breaths or more in one minute

POSTER 4:
(Prepared poster)

No pneumonia

If the patient has no signs of very severe illness or pneumonia, she may have:

• **Wheeze**

If this is the first time the patient has had a wheeze, treat her for pneumonia. If the patient has a wheeze and has had wheeze before, they probably have asthma. Treat the wheeze. If the patient is a smoker or ex smoker and usually has a wheeze or usually have shortness of breath when walking on level ground or slightly uphill they will often have a condition called Chronic Obstructive Pulmonary Disease or COPD for short.

• **Bronchitis**

If a patient aged 13 years or more has been coughing up yellow or green sputum for 8 days or more, treat her for bronchitis, if she seems to be getting worse. Bronchitis often gets better without treatment.

If a patient has red sputum which is not caused by a nosebleed, treat her for bronchitis with an antibiotic. If the red sputum does not improve within a week send her to the tuberculosis clinic or examine the sputum with GeneXpert. (Tuberculosis is covered in Lesson 12.)

Consider treating the bronchitis with amoxicillin 250 mg three times a day for 5 days. If you do not have amoxicillin, use co-trimoxazole. Use co-trimoxazole if the patient has a fever and might have malaria. But do a malaria test. Coartem is a better malaria treatment.

• **Upper respiratory infection**

If the patient has a cough but no pneumonia, asthma or bronchitis, she probably has an upper respiratory infection. She may cough up coloured or clear sputum, but will not have fast breathing. Do not give an antibiotic. Teach the patient about home care for chest illnesses and advise her to eat a mixed diet.

If the patient has an ear or throat problem, she may need an antibiotic.

• **Fever**

If the patient has a fever test for malaria in malaria areas.

Give each student a copy of Tables 3, 4 and 5 and encourage questions. If your students need a way to measure liquid medicines, teach Appendix 5.

TABLE 3 Antibiotics for pneumonia: amoxicillin

Age	Dose of amoxicillin oral
Up to 2 months	62.5 mg 3 times a day for 5 days (2.5ml or 1/4 tablet)
2 months up to 12 months	125 mg 3 times a day for 5 days (5 ml or 1/2 tablet)
12 months up to 10 years	250mg 3 times a day for 5 days (10ml or 1 tablet)
11 years and over	500 mg 3 times a day for 5 days (2 tablets)

TABLE 4 Antibiotics for pneumonia: co-trimoxazole

Age	Dose of co-trimoxazole oral
Up to 6 months	2.5 ml 2 times a day for 5 days (1/4 tablet)
6 months up to 6 years	5 ml 2 times a day for 5 days (1/2 tablet)
6 years up to 13 years	1 tablet (480 mg) 2 times a day for 5 days
13 years and over	2 tablets (960 mg) 2 times a day for 5 days

TABLE 5 Antibiotics for severe pneumonia: benzylpenicillin

Age	Dose of benzylpenicillin intramuscular
Up to 2 months	0.1 million IU for each kg of body weight then send to hospital
2 months up to 5 years	Only if severe pneumonia. 0.1 million IU for each kg of body weight but no more than 2 million IU
6 years up to 12 years	
13 years and over	Only if severe pneumonia. 2 million IU

How to treat wheeze

If a patient has wheeze, you must decide first if they have respiratory distress. Patients with respiratory distress find it very difficult to breathe. Respiratory distress can be caused by pneumonia and asthma.

POSTER 5:
(Student answer poster)

Respiratory distress

Ask the students to tell you if they have seen patients with respiratory distress. Ask what they have seen.

The patient looks **uncomfortable** and has **fast breathing** (fast breathing in a patient who looks comfortable is *not* a sign of respiratory distress).

There is **severe chest indrawing**.

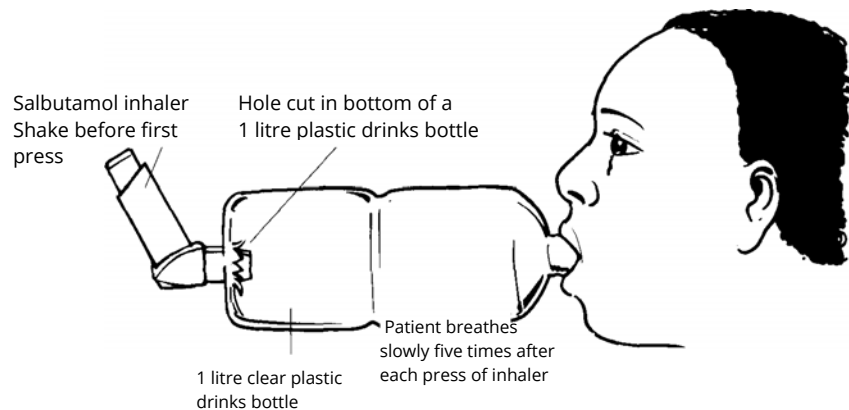
The patient is **not able to talk or feed**.

Treating wheeze when the patient has respiratory distress If a patient with a wheeze has any signs of respiratory distress, give her a rapid-acting bronchodilator (if over 1 year), and an injection of benzylpenicillin and send her to hospital immediately.

Commonly used rapid-acting bronchodilators are inhaled salbutamol or epinephrine injections. Give salbutamol from a metered-dose inhaler through a spacer. Shake the inhaler. Press the metered dose inhaler once for each time the patient breathes in five times. Repeat this two times. You may need to repeat this up to 10 times if the asthma attack is severe. Shake the inhaler each time. Consider repeating this after 10-30 minutes.

An alternative is epinephrine (for severe asthma) by injection under the skin. The doses are given in Table 6. Both treatments will usually make the pulse go faster.

Show your students how to make a spacer from a plastic bottle. Next, show them how to use it to give salbutamol (Picture 4). Give each student a copy of Appendix 3 'How to give injections'.



PICTURE 4 How to use a salbutamol inhaler

Treating wheeze when the patient has no respiratory distress

- If a patient with a wheeze has fast breathing, treat them for pneumonia which is not yet severe. These patients will not normally need a bronchodilator.
- If a patient who is not given antibiotics has a wheeze, give her a bronchodilator to use at home for 5 days. Teach the patient about home care for chest illnesses.
- Bronchodilators for use at home: aminophylline or oral salbutamol are slow-acting bronchodilators. The doses are given in Table 6. If possible, give treatment with a salbutamol metered-dose inhaler, used with a spacer. Show the patient how to use the inhaler. Explain that she needs to press the metered dose inhaler two times every 4 hours when wheezing is bad. *There is sometimes resistance to using inhalers for asthma because people might associate them with dying. Inhalers are expensive and tend to be prescribed for the most severely ill. People incorrectly think that they cause death.*
- If this is the second time the patient has had a wheeze with no other signs of pneumonia, tell her that she has asthma. Do not forget that patients with asthma may become ill with severe asthma or pneumonia.

Give each student a copy of Table 6 and encourage them to ask questions.

TABLE 6 Bronchodilators

Age	Dose of aminophylline 100 mg tablet (slow-acting)
Up to 12 months	1/4 tablet 3 times a day for 5 days
12 months up to 5 years	1/2 tablet 3 times a day for 5 days
6 years and over	1 tablet 3 times a day for 5 days
Age	Dose of oral salbutamol 2 or 4 mg tablet (slow-acting)
Up to 12 months	1 mg 3 times a day for 5 days
12 months up to 5 years	2 mg 3 times a day for 5 days
6 years and over	4 mg 3 times a day for 5 days
Age	Dose of epinephrine (1: 1000 = 0.1 %) (subcutaneous) (rapid-acting)
Up to 12 months	0.1 ml
12 months up to 5 years	0.25 ml (1/4 vial)
6 years and over	0.5 ml (1/2 vial)

Other emergency options for moderate and severe asthma

- Hydrocortisone 100 mg (4 mg/kg if less than 25 kg) can be injected intravenously for severe asthma if you have been taught intravenous injection skills.
- Moderate and severe asthma can be treated with oral steroid tablets. For example prednisolone 30 mg daily after food (preferably breakfast) for 3 days for patients weighing 15 kg or more (2 mg/kg per day if less than 15 kg). People with COPD may need to take prednisolone for 5 to 7 days if they get more breathless than usual with a fever or a change of sputum. Always give an observed dose of ivermectin (200 micrograms per kilogram) on one occasion in areas that have strongyloides, before treatment with steroids such as prednisolone. Consider also giving a 7 day course of doxycycline when someone with COPD has a fever or a change of sputum.

Options for moderate and severe asthma

When possible treat patients who have had a moderate or severe attack with a preventative treatment for asthma. Steroid inhalers taken via a spacer are a commonly used preventative treatment for asthma. If the patient has had no asthma symptoms for 3 months considering weaning the preventative treatment.

POSTER 6:
(Student answer poster)

Home treatment for chest illnesses

Ask the students what patients can do at home for chest illnesses.

- Give the patient **plenty of fluids**.
- Continue to **feed** the patient **at least four times a day**. Feed children aged 5 or less at least five times a day.

- Tell the patient to **come back to the health centre** if they have one of the following 4 problems:

- **not able to drink,**
- **breathing** becomes difficult or **fast,**
- becomes **more ill,**
- develops a **fever.**

POSTER 7:
(Student answer
poster)

SECTION 3: When to send patients to hospital

Ask the students which patients must go to hospital.

1. patients with a **general danger sign**
2. patients with a **severe illness which may be pneumonia or asthma**
3. patients who have **stridor when calm**
4. patients with **respiratory distress**
5. patients with an **oxygen saturation of less than 92%** or suspected COVID-19 complications.

Refreshment break

SECTION 4: Practical: examining real patients

In this section, the students practise their skills on the seven patients you have asked to come to the lesson.

- You and the six students who have discussed each patient's symptoms, signs, diagnosis and treatment are the helpers.
- Each helper and her patient will sit in a different part of the classroom.
- Each helper will work with a small group of students to ask questions and examine one patient. The helper's job is to make sure that each group of students correctly finds the patient's symptoms and signs and decides on a diagnosis and treatment.
- Divide the class into seven groups. Give the groups 20 minutes to see each patient. After they have examined one patient, ask the groups of students to move on to the next patient. All the groups should examine all seven patients.
- Tell the students to use Appendix 1 and Appendix 2 to help them to ask questions, look for general danger signs, examine and decide how to treat each patient.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz. If the answers show that some students do not understand a point, ask a student who does understand to explain the point to the other students. Summarise the answer next to the questions on Poster 1.

1. If a patient is ill, he may breathe fast. How many breaths in one minute is fast breathing?

For a child up to 2 months? - 60 breaths or more in one minute
For a child aged 2 months up to 12 months? - 50 breaths or more in one minute
For a child aged 12 months up to 5 years? - 40 breaths or more in one minute
For a child aged 6 years up to 12 years? - 30 breaths or more in one minute
For an adult? - 25 breaths or more in one minute

2. What would make you think that a patient had a severe illness which may be pneumonia or asthma?

The patient has: chest indrawing, stridor when calm, respiratory distress.

The patient is a child less than 2 months old who is breathing 60 times or more in one minute.

3. Patients who find it very difficult to breathe have respiratory distress. What are the signs of respiratory distress?

The patient looks uncomfortable and has fast breathing, or

There is chest indrawing, or

The patient is not able to talk or feed

4. Why do some people not like using inhalers?

There is sometimes resistance to using inhalers for asthma because people associate them with dying. Inhalers are expensive and tend to be prescribed for the most severely ill. People incorrectly think that they cause death.

5. A patient has a cough. She feeds well. She does not have chest indrawing. She does not have fast breathing. There is no noise when she breathes in or out. She has a fever. When she coughs there is no pain in the side of chest. She is not anaemic. What illness(es) does she have?

Upper respiratory infection. She may also have malaria, if there is malaria in the area.

What treatment should you give her?

The patient does not need an antibiotic, unless she has an ear or throat problem.

Test for malaria if there is malaria in the area (unless the test is negative). Teach the patient or the carer about home treatment for chest illnesses.

6. How might you prevent yourself from catching colds, COVID-19 and TB in the clinic?

Wear a mask in clinic. Ask patients with a cough to wear a mask when they are in clinic, or with groups of people. Open the windows to allow the air to circulate. TB mycobacteria can stay in the air for several hours after it has been coughed out by a person.

Lesson 3 **Fever, malaria, convulsions and meningitis**

BEFORE THE LESSON

- There are eight posters in this lesson. (See p. 4 for information on how to use the posters.)

Prepared posters: 1, 4, 8

Student answer posters: 2, 5, 6, 7

Summary poster: 3

- Give one student a copy of the demonstration in this lesson. Practise the demonstration before the lesson. You need a pen, a patient record card and a child growth chart.
- Give each student a copy of Table 1, summarising the doses of artemether-lumefantrine (Coartem).
- Prepare one copy of the discussion about patients in section 5 for each group of five students. For example, if you have 25 students, you will need five copies.
- Ask the students to bring their copy of Chapter 2 to the lesson.
- Listen to this podcast about malaria in Zambia created by Professor Bob Mills: <https://podcasters.spotify.com/pod/show/the-virtual-doctors/episodes/Malaria-e2c691g>

Lesson plan

1 Quiz

2 Diagnosis and management of fever

3 Diagnosis and management of convulsions, meningitis and cerebral malaria

4 When to send patients to hospital

5 Practical - discussion about patients

6 Answers to the quiz

SECTION 1: Quiz

POSTER 1: *(Prepared poster)*

Cross out the first-line malaria treatment that is *not* used in your country. Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. What are the four general danger signs?
2. If the patient has a general danger sign, Kernig's sign or a fever with a stiff neck, what seven things will you do?
3. What is severe, or cerebral, malaria?
4. The following patients all have meningitis. What could you find when you take a history or examine them?
 - a child aged 2 months
 - a child aged 3 years
 - a woman aged 31 years

Section 2: Diagnosis and management of fever

Section 2 starts with a demonstration. Ask a student to play a woman with a baby. You will play the doctor. Make sure you have a pen, a patient record card and a child growth chart. Say the lines slowly and loudly so that the class can hear.

The doctor sits near to a mother with her child in a health centre.

Demonstration

Doctor: Good morning.

Mother: Good morning.

Doctor: Please take a seat.

Mother: Thank you.

Doctor: Who is ill today?

Mother: My child Pili Tatu.

Doctor: How old is she?

Mother: One year old.

Doctor: What would you like to talk about today?

Mother: She has had a fever for two days.

Doctor: Was there anything else?

Mother: She is not feeding well and she vomited once this morning.

Doctor: Has she had a convulsion?

Mother: No, she's just not herself

Doctor: Does she have a cough?

Mother: No.

Doctor: Does she have diarrhoea?

Mother: No.

The doctor examines the child.

Doctor: She has a high fever. Your child may have malaria. Let's do a malaria test now. May I see her growth chart? I see she has had all her vaccinations. She weighs 9 kg.

Cross out the box below that does not apply in your country.

If the first-line malaria treatment in your country is artemether-lumefantrine:

Doctor: Your child has malaria: She needs to take artemether-lumefantrine (Coartem). Give her one tablet two times a day for 3 days.

Mother: Yes I will.

Doctor: Can you tell me what I have asked you to do?

Mother: Give two tablets once a day for 3 days.

Doctor: Not quite. Give her one tablet two times a day for 3 days.

Mother: Oh. I give her one tablet two times a day for 3 days.

Doctor: That is correct. And we can give her the first dose here and watch her for half an hour to make sure that she can keep the medicine down.

If the first-line malaria treatment in your country is not artemether-lumefantrine:

Write a suitable dialogue between a doctor and a mother or edit the one above.

Doctor: Now I will show you how to bring her temperature down. It is important that the child does not get very hot. If the child gets hot, take her clothes off. Put a cloth in warm water. Wipe her body to keep the skin wet until the fever has gone. This will take less than 30 minutes. If the child vomits within one hour of taking the medicine, bring her back to the health centre. If she is still hot after two days, bring her back to the health centre.

Mother: Thank you.

Doctor: Now we will give her the first dose of her malaria medicine before you leave the health centre.

Ask your students: What did you think about that consultation? Look for the following answer:

Answer The communication was very good.

Ask your students: Why do you think the communication was good? Look for the following answers:

Answer The doctor and the child's mother sat close to each other.

Answer The doctor greeted the mother.

Answer The doctor was interested in the patient's problem.

Answer The doctor explained the medicine and the treatment.

Ask your students: What will be the result of this good communication? Look for the following answers:

Answer The mother will understand how to give the medicine.

Answer If the child does not get better after 2 days, the mother will bring the child back to see the doctor.

Answer The mother knows how to do tepid sponging.

Answer The mother is now less worried.

Fever

Fever is usually caused by the patient's body fighting against an infection.

- If fever is caused by a serious infection, for example malaria or pneumonia, the infections must be treated.
- If fever is caused by an infection that is not serious, for example an upper respiratory infection, the infection does not need treatment.
- If fever is caused by COVID-19, the majority of people do not need treatment. Learn more about COVID-19 in appendix 22.

- Fever, tiredness and/or swollen lymph nodes occur in 50-70% of people newly infected with HIV. Consider arranging an HIV test in at risk patients. And perhaps repeat the HIV test after 2-3 months, since it may take some time for HIV to show positive.

In many areas of the world, malaria is the most common serious cause of fever. Malaria is caused by malaria parasites. The parasites get into the body if a person is bitten by a mosquito that has malaria parasites. *If you live in an area where there is no malaria, do not treat patients with a malaria treatment. If the patient has been in an area where there is malaria, then follow the advice given below.*

Treatment of fever

The most important thing to do is to treat the cause of the fever. Check first to see if a patient has a general danger sign, Kernig's sign or a stiff neck. These signs mean that the patient may have severe malaria, pneumonia or meningitis. These serious infections may be causing his fever. If there is a general danger sign, Kernig's sign or a stiff neck, treat the patient for a very severe febrile disease. To diagnose malaria use a rapid diagnostic test (RDT) or arrange a thick blood film to be done by an experienced laboratory technician. The RDT will remain positive for 3 weeks even after successful treatment of malaria.

POSTER 2:

(Student answer poster)

The four general danger signs

Ask your students: What are the four general danger signs? (The correct answers are in Chapter 2, see page 8)

POSTER 3:

(Summary poster)

Treat the cause of the fever

1. Take a history and examine the patient. If you think that the patient has pneumonia, **treat the pneumonia immediately** in the health centre.
2. **(a) In areas where there is no malaria:**
 - If the patient does not have a general danger sign, **treat the cause of the fever**. Bring down a **high fever** (38.5°C or more under the arm; or 38.9 or more in the ear, mouth or rectum) by **tepid sponging** and give a single dose of **paracetamol** in the health centre. Tell the patient to go to hospital if the fever is no better after 5 days.
 - If the patient has recently been in an area where there is malaria, test (or treat) for malaria immediately.
- (b) In areas where there is malaria:**
 - **Test for malaria** if the patient has had a **fever** in the **last 3 days**.
 - If the patient has received malaria treatment in the last 3 weeks do not use a rapid detection test (RDT). Only a malaria film will be helpful.
 - Bring down a high fever by **tepid sponging** and give a single dose of **paracetamol at the health centre**. After the fever has come down, give the first-line malaria treatment (an Artemisinin Combination Therapy such as **Coartem**) if you diagnose malaria. Coartem must be given with food.

LESSON 3 Fever, malaria, convulsions and meningitis

(continued)

- If you can't test for malaria and you think that a child or a pregnant woman has pneumonia and possible malaria, treat with co-trimoxazole.
- If you have done a blood test to confirm a malaria diagnosis, and the patient also has pneumonia, give the first-line malaria treatment and an antibiotic for the pneumonia.

3. **Teach** carers to treat a fever by **tepid sponging**.

4. **If** the patient **vomits less than one hour after** taking the **tablets**, bring down the fever by **tepid sponging**. Next, give him the **same dose again**.

5. Look for the measles rash. A patient who has fever and a rash all over his body may have measles. The rash does *not* itch. Diagnose measles if the patient also has red eyes *or* a cough *or* fluid coming from the nose.

- If a patient has **measles**, **give** him **vitamin A**.
- If a patient has had measles in the last 3 months, give him vitamin A.

If a patient has measles, look at the corneas in the eyes. If a **cornea is not clear**, treat the eyes with **tetracycline eye ointment**, give an intramuscular injection of benzylpenicillin, and send the patient to **hospital**.

First-line malaria treatment

The first-line treatment for malaria is usually an Artemisinin Combination Therapy such as artemether-lumefantrine (Coartem). The national drug policy in each country will tell you what the first-line malaria treatment is. Artemether-lumefantrine (Coartem) is given in six doses on 3 days.

POSTER 4:
(Prepared poster)

Cross out the box below that does not apply in your country.

Dose of artemether-lumefantrine (Coartem)

If Artemisinin Combination Therapy such as **artemether-lumefantrine (Coartem)** is the first-line malaria treatment used in your country, give each student a copy of Table 1. Encourage them to ask questions about the table.

If another therapy is the first-line malaria treatment used in your country, give each student a copy of the appropriate dosing table. Encourage them to ask questions about the table.

Artemisinin Combination Therapy such as Coartem is the first line treatment for malaria throughout pregnancy and for breast feeding mothers (with food).

TABLE 1 Dose of artemether-lumefantrine (Coartem)

Age (years)	Weight (kg)	Number of tablets per dose:		Artemether (A) + Lumefantrine (L) per dose
		0 hours 24 hours 48 hours	8 hours 36 hours 60 hours	
0-5	Up to 14	1		20mg A + 120mg L
6-8	15-24	2		40mg A + 240mg L
9-12	25-34	3		60mg A + 360mg L
Over 12	35	4		80mg A + 480mg L

Cross out the box below that does not apply in your country:

In many areas of South East Asia: Typhus is common and causes a fever.
 Headache, muscle aches and a dry cough are also common. Typhus is difficult to diagnose. Look for a dark scab or eschar (caused by a bite from a chigger mite or tick).
 If you find an eschar, or a fever persists for more than 48 hours, in an area where Typhus is common:
 Consider treatment for Typhus:
 Pregnant women: Azithromycin 500mg stat
 Most other patients Doxycycline 200mg after food daily for 3-7 days (give 3 days and review).

In many areas of the world: Dengue is common and causes a fever.
 Severe headache especially behind the eyes, muscle aches and severe joint pains (break-bone fever) are also common.
 Do not give Non Steroidal Anti-Inflammatories to people with a fever in areas with dengue. Paracetamol will make patients feel better. Give oral rehydration especially during the dangerous time
 As the fever settles a widespread rash (maculopapular) usually appears. This is the dangerous time, when warning signs can start to appear. Tiredness (lethargy), abdominal pain, bleeding from the nose and mouth and in the skin, persistent vomiting, enlargement of the liver and fluid in the abdomen or lung (ascites and pleural effusions) are warning signs. Send these patients urgently to hospital. The tourniquet test may be used to check for low platelets if you can not do a full blood count. If the tourniquet test is positive, or the platelet count is low, the patient is more at risk of bleeding and may need intravenous fluids or even a blood transfusion.

Fever which persists after treatment with the first-line malaria treatment

Occasionally malaria parasites are resistant to the first-line malaria treatment. If parasites are resistant, this means the treatment will not kill all of them. This is extremely rare with Artemisinin Combination Therapy such as Coartem when they have been taken correctly, with food. The Rapid Diagnostic Tests, based on malaria antigens, stay positive for malaria after successful malaria treatment for up to 3 weeks.

Malaria of course is not the only cause of a fever. Many viral infections, including COVID-19 cause a fever in the first few days. Typically, new variants of COVID 19 cause a sore throat, a runny nose and a headache. Fatigue and sneezing are also common. Early variants of COVID cause either a cough (70% or less) and / or a loss of the sense of smell or taste (approx. 40%). COVID-19 can also cause a headache (25%), widespread muscle pain (17%), tiredness (30%), a sore throat (16%), sputum production (18%), diarrhoea or vomiting (20%) or a runny nose (8%). Please see appendix 34 for a table summarising the infectious causes of fever.

Near patient (lateral flow) tests are typically not good at picking up COVID-19 in the first day of symptoms. So test on day 2 onwards. False negative tests are common. If there is a lot of COVID about and the lateral flow test is negative do not be confident that it is not COVID. PCR tests are more sensitive than lateral flow tests, but even PCR tests can still give a falsely negative result! Whilst COVID-19 is common: If the history suggests COVID-19 and a malaria test is negative and you can find no other cause for a fever tell the patient that they probably have COVID-19 (fever is present in 77% of COVID patients with early variants). Treat them with the national treatment for COVID-19 and advise them when to come back. They should watch for complications of COVID-19 and come back urgently if they have any of the complications. A PCR test will remain positive for some time after the patient recovers from COVID-19 even though they are no longer infectious. After a mild infection there is usually no need to repeat a COVID test.

Read appendix 23 to learn more about COVID-19.

The next box tells you what to do if fever does not get better with Artemisinin Combination Therapy such as Coartem.

Ask your students what they should do if a patient with fever is treated with Coartem but does not get better. Look for the following answers:

Answer First, look again for another cause of the fever. Take the patient's history. Examine the patient. Look at their ears and throat and consider checking a urine sample.

Answer If you can find no other cause for the fever, check that the patient used the medicine correctly. Consider sending the patient to have a malaria blood film test. Do not do a Rapid Diagnostic Test at this stage. The RDT will remain positive for 3 weeks even after successful treatment of malaria.

Answer If the malaria blood film test shows that the patient has malaria consider giving an Artemisinin Combination Therapy such as Coartem, with better supervision and with food to improve its absorption. Consider treating patients weighing more than 70kg for 5 days rather than 3.

Answer If a patient still has a fever 2 days after treatment with a second-line malaria treatment, send them to hospital. The patient may have typhoid fever, relapsing fever, typhus, Kala Azar or another infection which is causing the fever.

SECTION 3: Diagnosis and management of convulsions, meningitis and cerebral malaria

Convulsions

Cerebral malaria, meningitis or a high fever can cause convulsions. A patient having a convulsion becomes stiff and may shake. They are not able to stop the stiffness or shaking.

Causes of convulsions

Ask the students: What causes convulsions?

POSTER 5:
Student Answer
Poster

Cerebral malaria.

Meningitis.

A high fever. Many illnesses cause a high fever. A child may have a febrile convulsion if her fever becomes high very quickly. Only children less than 5 years old have febrile convulsions.

Low blood sugar. This is called hypoglycaemia. Patients with very severe febrile disease get hypoglycaemia. A patient with diabetes may also get hypoglycaemia if she takes too much insulin or too many diabetes tablets.

Epilepsy. (See Lesson 11.)

Generalised tetanus. (See Appendix 29)

Ask your students: How can we prevent a patient with a fever or a general danger sign from having a convulsion? Look for the following answers:

Answer **Tepid sponging** can prevent some convulsions caused by fever, because tepid sponging cools the body.

Answer A single dose of **paracetamol** in the health centre helps to cool the body.

Answer **Treat** a patient with a general danger sign **to prevent low blood sugar.**

Ask your students how they would treat a patient who has had a convulsion in the past 24 hours. Look for the following answer:

Answer The convulsion may be caused by severe malaria or meningitis. Treat in the same way as you would treat a patient who has a very severe febrile disease (see Chapter 2). This treatment may cure severe malaria, pneumonia or meningitis.

Cerebral malaria

Cerebral malaria is a serious illness that damages the brain. It is caused by a type of malaria called falciparum malaria. Giving the correct treatment as soon as possible will save many lives. Children less than 5 years old and women who are pregnant for the first time get cerebral malaria more than other patients. (In many countries pregnant women are given preventative medication for malaria eg Fansidar 3 tablets are give after 13 weeks gestation and twice more in the 2nd and 3rd trimester, this is not necessary if the woman is already taking cotrimoxazole to prevent Pneumocystis Jirovecii Pneumonia in HIV.) The symptoms of cerebral malaria may be the same as symptoms of meningitis. You do not need to know whether a patient has cerebral malaria or meningitis to decide about treatment.

Ask your students how they would treat a patient with symptoms of cerebral malaria or meningitis. Look for the following answer:

Answer Both illnesses are treated in the same way as a very severe febrile disease. If you can test for malaria immediately: do so. If an immediate malaria test is negative you can omit the malaria part of the treatment.

Meningitis

Meningitis is a serious illness that damages the brain. It can be caused by infection with bacteria or a virus. Giving the correct treatment as soon as possible will save many lives. However, some patients will die from meningitis, even if they get the correct treatment.



Child with Meningitis

POSTER 6:
(Student answer
poster)

Signs of meningitis in patients aged under 6 months

A patient aged under 6 months has meningitis. Ask your students: What might you find when you take a history or examine him?

Convulsions.

Fever.

The child is **unable to breastfeed.**

Vomiting.

POSTER 7:
(Student answer
poster)

Signs of meningitis in patients aged more than 6 months

A patient aged more than 6 months has meningitis. Ask your students: What might you find when you take a history or examine her?

A **stiff neck**. If a child can move and bend her neck, she does not have a stiff neck. Tickle the patient's toes to encourage her to look down. Look for **Kernig's sign**. Kernig's sign is a pain felt in the back, neck or head when the patient's hip is bent and the knee straightened.

Convulsions, fever or vomiting.

Ask the students how they would treat a patient with symptoms of meningitis. Look for the following answer:

Answer Treat all patients who have a general danger sign, a stiff neck, or Kernig's sign with the treatment for a very severe febrile disease.

Show the students how to look for Kernig's sign. Ask your students to tell you what six things they should do if a patient has a very severe febrile disease, or a stiff neck or Kernig's sign. The answers are in Chapter 2.

Refreshment break

SECTION 4: When to send patients to hospital

Send patients with a fever to hospital:

1. if the patient has one of the four **general danger signs, Kernig's sign** or a **stiff neck**
2. if the patient has **severe anaemia**
3. if the patient has **jaundice**
4. if the fever is **no better 2 days after treatment** with the first-line malaria treatment - for a malaria blood test
5. if a patient still has a **fever 2 days after treatment with a second malaria treatment.**

SECTION 5: Practical - discussion about patients

Divide the students into groups of five or six. Give each group of students a copy of the following questions. Tell the students that this activity will show them how to treat three patients with common illnesses. The students have 30 minutes to decide what illness each patient has and what treatment to give each patient.

(If there is no malaria in your country give patients 1 and 2 in the following examples other illnesses that cause a fever.)

Activity

Patient 1 A 2-year-old girl has had a fever and diarrhoea for the last 2 days. Today she has had diarrhoea three times, but she does not have a fever. The girl is not anaemic and not dehydrated. She weighs 13 kg.

1. What test would you ask for if it was available to you?
2. What illness is important to diagnose urgently?
3. How might you treat her depending on the result?
4. What advice will you give her carer?

Patient 2 A 5-year-old boy was treated with the first-line malaria treatment 9 days ago. The boy now has a fever and a cough. He is able to drink. He breathes 30 times in one minute. He does not have chest indrawing. There is no noise when he breathes in or out. He is not anaemic. He weighs 17 kg.

1. What illness does the boy have?
2. How will you treat him?
3. What advice will you give his carer?

Patient 3 A 4-month-old boy has had a fever for one day. He has had a convulsion. He has vomited once. He is not breastfeeding well. He has a high fever. He moves less than usual when awake but he is not having a convulsion now.

1. What illness does he have?
2. How will you treat him?

Answers

Ask the students to call out their answers. Give them the correct answers:

Patient 1 1. What test would you ask for if it was available to you?
Malaria rapid antigen test. Thick blood film to look for malaria parasites.

2. What illness is important to diagnose urgently?

Malaria.

3. How might you treat her depending on the result?

Coartem 1 tablet twice a day for 3 days.

4. What advice will you give her carer?

Advise her to do tepid sponging to reduce the fever. If the patient vomits within one hour of taking the medicine, the carer should bring her back to the health centre. If she is still hot after 2 days, return to the health centre.

Patient 2 1. What illness does the boy have?

The boy may have malaria which is resistant to the first-line malaria treatment. Do not use a Rapid Diagnostic Test. Instead arrange an urgent thick blood film test.

2. How will you treat him?

Send him to hospital or do a malaria blood film test.

3. What advice will you give his carer?

Advise her to do tepid sponging. She should give the child a mixed diet five times a day or more until he is well again and continue to feed the child five times a day for a week after he gets well.

Patient 3 1. What illness does he have?

A very severe febrile disease.

2. What should his treatment be?

If he has vomited, clear his mouth with your finger. Lay him on his side.

Use tepid sponging to reduce the fever. Treat the patient to prevent low blood sugar: give 30-50 ml of expressed breastmilk or milk or sugar-water, using a cup and spoon.

If there is malaria in the area, do a Rapid Diagnostic Test for malaria if possible. If the result is positive give him an intramuscular injection of artesunate or quinine.

Give the patient an intramuscular injection of ceftriaxone, benzylpenicillin

*or procaine penicillin fortified.
Send him to hospital immediately.*

SECTION 6: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. What are the four general danger signs?

See answers in Chapter 2, see p. 7.

2. If patient has a general danger sign, a stiff neck or Kernig's sign what seven things will you do?

See answers in Chapter 2, see p. 8.

3. What is severe, or cerebral, malaria?

Malaria parasites can cause brain irritation. The symptoms of cerebral, or severe, malaria can be very similar to the symptoms of meningitis or sepsis. Test for malaria or treat with for example an artesunate injection.

4. The following patients all have meningitis. What might you find when you take a history or examine the patient?

2-month-old child: *a general danger sign, fever*

3-year-old child: *a stiff neck, Kernig's sign, a general danger sign, fever*

31-year-old woman: *a stiff neck, Kernig's sign, a general danger sign, fever*

Lesson 4 **Malnutrition and anaemia**

BEFORE THE LESSON

- This is a long lesson. We suggest you split it into 2 lessons. You might do one lesson before lunch and one after lunch. Plan to have at least one refreshment break during the lesson in addition to a lunch break.
- There are 13 posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared posters: 1,3,6,7,10,12,13.
Student answer posters: 2, 4, 5, 8, 9, 11.
- Ask students to read Appendix 6 How to treat malnutrition and anaemia before the lesson.
- Ask students to read Appendix 7 How to set up a nutrition clinic before the lesson.
- Prepare the role plays. Write the information for the patient, the doctor and the observer on separate pieces of paper. Use a paper clip to keep each role play together. You need six copies of each role play, one copy for each of six groups of students.
- Prepare six copies of the growth charts in Pictures 11, 12 and 13 using real growth charts.
- If the direct recording scale is used in your country, you will need a direct recording scale, a pen, a bucket of water, two cups and some string.
- If you *do not* use direct recording scale, fill in the last two weights in the growth chart for role play 4 (Picture 13). Juanita Garcia Lopez's growth line has gone down on the two most recent weighings.
- Cut out 10 triangles and 7 circles from paper for the activity in section 3.
- In Table 3 cross out the box of advice about malaria treatment if there is no malaria in your country.
- If tablets that combine ferrous sulphate 200 mg (60 mg iron) and folic acid 0.25 mg are available, recommend this combination to treat anaemia instead of ferrous sulphate 200mg.

Lesson plan

1 Quiz

2 Diagnosis and management of malnutrition

3 Diagnosis and management of anaemia

4 When to send patients to hospital

5 Practical

6 Answers to the quiz

SECTION 1: Quiz

POSTER 1: (Prepared poster)

Copy the *growth lines only* from the growth charts in Pictures 5, 6 and 7 (see page 56) into the poster below question 1. Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. What do the following growth lines mean? What will you do for each child?
 - (growing)
 - (got growing)
 - (losing weight)
2. What are the six rules of good nutrition?
3. What happens to a child who is not given food which follows the six rules of good nutrition?
4. What are the causes of anaemia?

SECTION 2: Diagnosis and management of malnutrition

People need to eat a mixed diet that includes different types of food. A mixed diet helps people to work, grow and fight illness. People get malnutrition if they do not eat enough of the right foods.

Eating a mixed diet is very important for children aged less than 5 years. Children with malnutrition do not grow and are more likely to get ill. A mixed diet is also important for young women and women who are pregnant or breast feeding. A mixed diet helps them to stay well and to have healthy babies. As well as a good diet, it is also good to advise women to wait for 2 or 3 years between pregnancies. During this time, a mixed diet will help their bodies become strong again to have a healthy baby and to produce nutritious breast milk.

Eating a mixed diet

People need food that gives them energy, protein, vitamins, minerals and carbohydrate.

Energy

Children need food containing energy when they are growing.

You can make sure children get enough energy by:

- giving them four or more meals of carbohydrate food every day
- adding foods that contain large amounts of energy to some or all of a child's meals.

Protein

- Children must eat protein at least one time every day to help them to grow.

Vitamins and minerals

- Vitamins and minerals help children to grow and help adults and children to fight infections. Iron is a mineral we need in order to make haemoglobin. Vitamin C and folic acid are important vitamins. Vitamin C helps our bodies to use the iron in food. Unfortunately, drinking tea or coffee with meals prevents our bodies from using iron.

POSTER 2:

(Student answer poster)

Examples of nutritious foods

Ask the students what local foods contain large amounts of energy, protein, vitamins, minerals and carbohydrate. Table 1 below gives examples of correct answers. Choose the foods from Table 1 which are available in your area.

TABLE 1 Examples of nutritious foods

Nutritional benefit	Examples of foods
Energy	Cooking oil, sugar, palm oil, groundnut oil and fried foods
Protein	Breast milk, beans, lentils and fish. Liver, kidney, blood, eggs, grasshoppers, locusts, crickets and termites
Vitamin C	Fresh fruit, lightly cooked vegetables and green leafy vegetables
Folic acid	Breast milk, beans, groundnuts, lentils, green leafy vegetables, liver and kidney
Iron	Small whole fish, fish and dark green leafy vegetables. Liver and kidney, blood, eggs, grasshoppers, locusts, crickets and termites
Carbohydrate	Maize, cassava, rice and potatoes

POSTER 3:
(Prepared poster)

How to prevent malnutrition

Advise:

- Children and pregnant women to eat four meals a day
- Everyone to eat protein foods at least one time every day
- Everyone to eat dark green leafy vegetables, fruit or lightly cooked vegetables at least two times a day

Six rules of good nutrition

People have malnutrition because they are poor or because they do not know how to eat a mixed diet. Health workers cannot prevent poverty, but they can tell people how to eat a mixed diet to prevent malnutrition.

If you are a health worker you can:

- Teach by example, by giving your own family a mixed diet.
- Arrange cooking demonstrations to show people how to make nutritious meals.
- Advise people about good local foods that are not expensive.
- Help people to grow local crops that are part of a mixed diet.
- Teach people about the six rules of good nutrition.

POSTER 4:

(Student answer poster)

Answer

The six rules of good nutrition

Ask the students: What are the six rules of good nutrition?

1. Continue to **breastfeed** children **until** they are **2 years** old. Breastfeed **at least six times a day**.
2. Give some **soft foods**, (for example cassava or maize porridge) **in addition to breastmilk after** the child is **6 months old**.
3. Give **protein foods** (for example beans, little fish or groundnuts) **in addition to breastmilk** after the child is **6 months old**. Mash or crush these foods until the child is 12 months old, to help him to eat them.
4. Give **vegetables and fruit in addition to breastmilk after** the child is **6 months old**. Mash or crush these foods until the child is 12 months old.
5. Give **all children over** the age of **9 months** at least **four meals a day in addition to breastmilk**.
6. **Give ill children more food** than usual. Feed ill children who are more than 9 months old five times a day. Breastfeed all ill children who are less than 2 years old at least eight times a day. Continue to feed the child more often until the child is well again and for one extra week.

Answer

Answer

Answer

Answer

Answer

Carers will learn more if you help them to prepare foods which follow the six rules of good nutrition. Ask carers to repeat the rules of good nutrition to you.

When do children get malnutrition?

Children are more likely to get malnutrition at particular times. We have called these danger times. If we know when children are in danger of getting malnutrition, we can teach carers how to prevent malnutrition.

Malnutrition danger times for children

Ask the students when children are in danger of getting malnutrition. Table 2 lists the danger times.

TABLE 2 Malnutrition danger times for children

Danger time	Reason
Before birth	If the pregnant woman has a poor diet , the baby does not grow well inside the woman. The woman is also not able to make enough breastmilk to feed her new baby.

POSTER 5:

(Student answer poster)

Answer

TABLE 2 (continued)

POSTER 5:
(Student answer
poster
continued)

Danger time	Reason
8 to 10 months	If a child is only fed with breastmilk he will not grow as well as he should. He needs other foods in addition to breast milk from six months of age.
If the mother gets pregnant again	She may stop breastfeeding . Breastfeeding when pregnant does not harm the child or the unborn baby.
After the mother stops breastfeeding.	Breast milk contains protein, energy, vitamins and minerals. If the child does not eat a mixed that he will not get enough protein, energy, vitamins and minerals .
The baby is bottle-fed	Breast milk is free, clean and protects children from diarrhoea. Milk from a bottle often has bacteria in which cause diarrhoea and weight loss.
Another baby is born	The mother has less time for the older child and stopped breastfeeding him.
The family is not able to get food because of famine, war or poverty	The child receives less food . The food that child receives is not a mixed diet .

Early malnutrition

Diagnosing and treating early malnutrition can save a child's life. It prevents the child from getting more severe malnutrition. Early malnutrition is easier to treat than severe malnutrition.

Growth charts

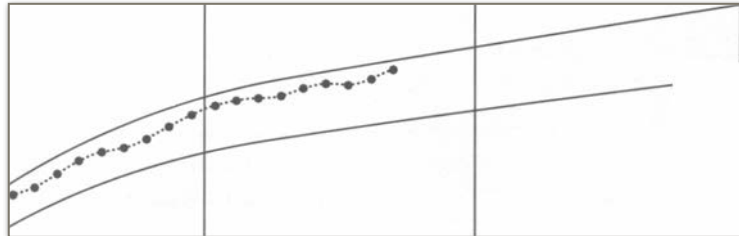
Growth charts show the carer and the health worker how well children are growing. A child's growth chart tells you if a child has early malnutrition.

If direct recording scales are used in your country, show the students what they look like. Explain how the direct recording scales work.

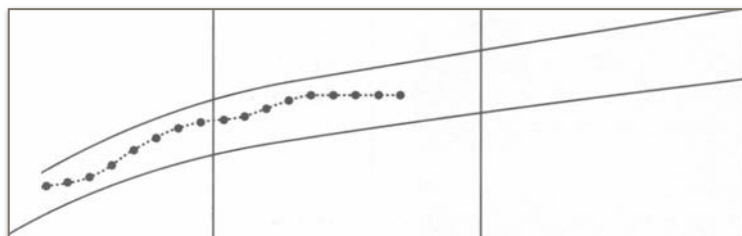
POSTER 6:
(Prepared poster)

Growth lines

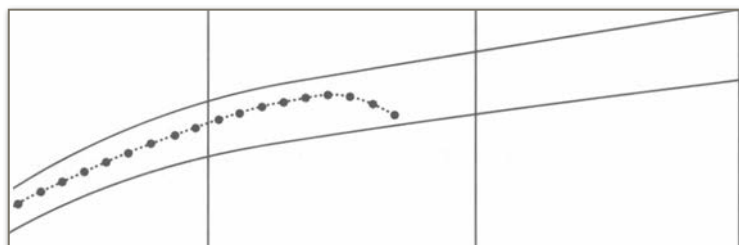
Copy Pictures 5, 6 and 7 onto poster 6.



PICTURE 5 *Growth chart of a child who is growing*



PICTURE 6 *Growth chart of a child who is not growing*



PICTURE 7 *Growth chart of a child who is losing weight*

Explain to the students that the line on a growth chart tells the health worker and the carer how well the child is growing. Tell the students that it is the *direction* of the line that is important .

- If the line is going up: the child is gaining weight and growing.
- If the line is flat: the child is not gaining weight and is not growing.
- If the line is going down: the child is losing weight and is not growing.

POSTER 7:

(Prepared poster)

Diagnosing malnutrition early

1. Weigh all children under 5 years of age at the Maternal and Child Health clinic. **Weigh children under** the age of **2 years every month**. **Weigh children over** the age of **2 years every 3 months**.
2. Each time you see a child **under** the age of **5 years** at your health centre, **look** at the child's **growth chart**.
3. If the growth line is flat or going down, treat the child for early malnutrition.
4. If the **growth line has gone down at the two most recent weighings**, or the child has swelling of the legs, he may have severe malnutrition. Send him to the nutrition clinic.

Treating early malnutrition

- Take the patient's history.
- Ask the mother if she has stopped breastfeeding or if the child is not eating a mixed diet.
- **Treat** any **illness** that you find.
- Teach the child's carer the **six rules of good nutrition**.
- Give **albendazole** for worms (including strongyloides).
- Albendazole 200 mg for children 6 months to 2 years, 400 mg for people 2 years of above, once a day for 3 days.
- Do not give albendazole if the patient has been treated in the last 6 months.

Severe malnutrition

Diagnosing severe malnutrition

POSTER 8:

(Student answer poster)

Signs of malnutrition in children

Ask the students: What do children with severe malnutrition look like?

They have wasted and **thin muscles**.

They have little fat underneath the skin and it is easy to see the **bones**.

They have **thin**, straight, and sometimes red **hair**.

They have mouth and skin **ulcers**.

They look sad, **do not** smile, and have **no interest** in what is going on around them.

They may have **swelling** of the **legs** and **under** their eyes.

This is called **kwashiorkor**. The swelling is caused by fluid under the skin which hides the thin muscles and bones.

Kwashiorkor

To tell if child has kwashiorkor, press the front of the lower part of the child's leg with your finger for 10 seconds. If, after you remove your finger, you can see where you were pressing, the child has fluid under his skin. Send children with fluid under the skin to **hospital immediately**.

LESSON 4 Malnutrition and anaemia Part one

Without treatment most children with kwashiorkor will die. Show Pictures 8 and 9 to the students. The child on the left has kwashiorkor. The child on the right has another type of severe malnutrition, and does not have swelling on the legs or under the eyes.



PICTURE 8 Child with kwashiorkor



PICTURE 9 *Child with severe malnutrition*

Treating severe malnutrition

Send all children with severe malnutrition to the nutrition clinic. Send children with kwashiorkor to hospital. The nutrition clinic may be in the community or at a hospital.

Children with severe malnutrition usually stay at the clinic for a week or longer.

Tell the students to come and talk to you in the refreshment break if they want to know more about how to run a nutrition clinic. Give them a copy of Appendix 7. This Appendix also describes how to feed children with severe malnutrition.

First *refreshment break*. When you start the next part of the lesson you could put the quiz back up and ask the students if they want to change any of their answers.

SECTION 3: Diagnosis and management of anaemia

Anaemia is a lack of haemoglobin. Haemoglobin is found in red blood cells. Haemoglobin is a protein that contains iron. Anaemia is caused by illnesses that stop the body making haemoglobin or illnesses that damage or waste red blood cells. Patients with anaemia are weak and are not good at fighting infections. They often have fast breathing. Pregnant women with anaemia may die or give birth to small, weak babies.

Causes of anaemia

Divide Poster 9 into two areas.

Give one area the title 'Prevent making haemoglobin'.

Give the other area the title 'Damage or waste red blood cells'.

Ask the students: What are the most common causes of anaemia in our country?

If sickle cell disease is a problem in your area, teach Appendix 8 at another time.

POSTER 9:
(Student answer
poster)

*Problems that **prevent** the body **making haemoglobin***

- Patients with **malnutrition** or who **do not eat a mixed diet** are not able to make haemoglobin
- **Children** grow very quickly between the ages of **6 months and 3 years**. Children should grow very quickly if they are **born very small**. If they do not eat foods containing a large amount of **iron** and **folic acid** they will not be able to make haemoglobin.

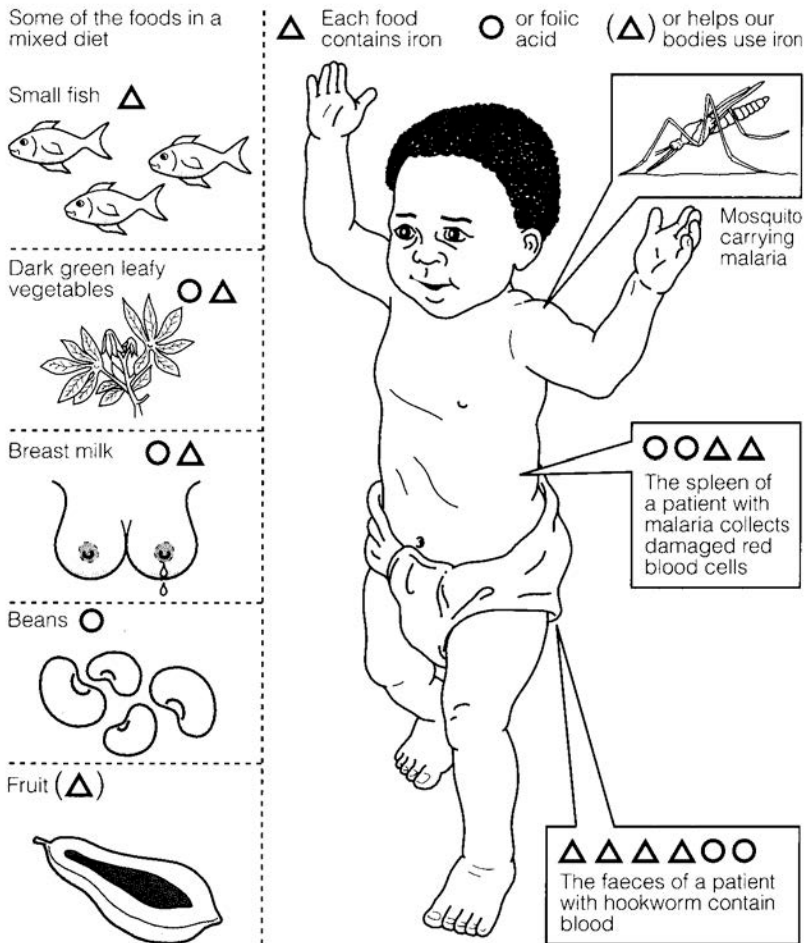
*Problems that **damage** or **waste red blood cells***

- **Malaria** damages red blood cells
- **Hookworm** cause bleeding into the bowel. A large number of hookworm cause anaemia
- **Pregnancy** uses a lot of iron and folic acid from the woman's body for the baby. If the woman does not eat a mixed diet to replace this iron and folic acid, she will become anaemic. Having many pregnancies in a short time causes anaemia
- Women who **bleed heavily every month** lose a lot of blood (see Lesson 7).
- **Sickle cell disease**.
- **Bleeding** into the stomach or intestine.

POSTER 10:
(Prepared poster)

Foods to prevent anaemia

Copy Picture 10 onto Poster 10. Do *not* draw the circles and triangles on the poster.



PICTURE 10 Foods to prevent anaemia

Give the 10 paper triangles and 7 paper circles to 17 students. Put sticky tape or Blu-tak on the back of each piece of paper or give the students pins to stick the pieces of paper onto Poster 10.

- Explain to the students that **haemoglobin** is made from **iron, folic acid** and protein. Tell them that the paper triangles represent iron and the circles represent folic acid.
- Tell the students that the foods on the left of the picture are examples of foods which prevent anaemia. Ask three students to put a triangle on a food that they think contains **iron**. These students should put a triangle on the small fish, dark green leafy vegetables and the breastmilk.
- Tell the students that fruit does not contain iron but it contains Vitamin C. **Vitamin C** helps our bodies use the iron in other food. Ask one student to put a triangle on the fruit. Draw brackets () around the triangle.
- Ask three students to put a circle on a food that they think contains **folic acid**. These students should put a circle on the dark green leafy vegetables, the breastmilk and the beans.

If a person or child eats these foods as part of a mixed diet he will be able to make haemoglobin and prevent anaemia. This child eats all of these foods.

Mosquitoes carry malaria. Malaria damages red blood cells and can cause anaemia. The spleen is a rubbish bin for damaged red blood cells. Children who get malaria often, may have a large spleen.

- Tell the students that the picture shows a mosquito on the child's skin. Ask four students to put two triangles and two circles near the spleen.
- This child also has many hookworm inside his bowel. Hookworm cause bleeding into the bowel. Folic acid and a large amount of iron are lost into the faeces. If a patient has a large number of hookworm in his bowel. he will become anaemic.
- Ask six students to put four triangles and two circles near the faeces (the child's bottom).

Preventing anaemia

We can do two things to prevent anaemia:

- help patients to make haemoglobin
- prevent illnesses that damage or waste red blood cells.

POSTER 11:

(Student answer poster)

How to prevent anaemia

Ask your students how we can prevent anaemia.

1. Eat a **mixed diet**.
2. **Wear shoes** to **prevent hookworm infections**.
3. Use **latrines**.
4. Use **mosquito nets to prevent malaria**, especially in children under the age of 5 years and pregnant women. Dip nets in permethrin every 6 months or deltamethrin every 12 months. Dip the nets just before the time of year when most people get malaria.
5. Advise women to wait until their youngest child is 2 years old before having another baby. This helps women to build up a store of folic acid and iron in their bodies. Breastfeeding helps to delay the next pregnancy.
6. Advise women to eat a mixed diet. In areas where iron deficiency is common, give **all pregnant women tablets of ferrous sulphate** 200 mg and folic acid 0.4 mg every day (or one tablet of ferrous sulphate 200 mg and one tablet of folic acid 0.25 mg every day).
7. Advise girls to wait until they are at least 17 years old before having a baby.
8. Treat heavy periods (see Lesson 7).

Diagnosing and treating anaemia

Anaemia may have more than one cause. Take the patient's history:

1. Look for general danger signs. Treat serious illnesses like pneumonia immediately.
2. Look for a fever. In malaria areas, test patients with anaemia, who have a fever, for malaria treatment immediately.
3. Look for anaemia in the patient's conjunctiva (the inside of the eyelid).
4. Look for fast breathing or fluid under the skin.

- If the inside of the eyelid looks less red than usual, or you cannot see the lines on the palm of the hand, the patient has anaemia.
- If the patient also has fast breathing or fluid under the skin, he may have severe anaemia. Give him the first-line malaria treatment if there is malaria in the area. Send him to hospital immediately.
- If a patient with anaemia does not have fast breathing or swollen legs, the patient has moderate anaemia. Treat patients with moderate anaemia with ferrous sulphate for 3 months if possible.
- If a woman with moderate anaemia is pregnant, measure her haemoglobin or send her to hospital. If her haemoglobin is less than 7 g/dl test her for malaria and send her to hospital.

POSTER 12: How to treat anaemia
(Prepared poster) Copy Table 3 onto Poster 12.

TABLE 3 How to treat anaemia

Priority	Illness	Treatment
1	Malaria , in malaria areas, if the patient has a fever or a positive test for malaria.	If first line malaria treatment is Coartem: Coartem twice a day for 3 days (see the malaria lesson for the dose). Or if the patient has a very severe febrile disease (if they have a general danger sign) treat with artesunate by injection and send to hospital. Give advice about tepid sponging. Return after finishing the medicine for further treatment.
2	Hookworm	(Ask if the patient may be pregnant.) Mebendazole or albendazole for 3 days. Do not give mebendazole or albendazole to patients less than 1 year old, or women in the first 3 months of pregnancy. Give patients advice about wearing shoes and using latrines. Return after finishing the medicine for further treatment.
3	Poor diet	Folic acid 5mg daily and low dose Ferrous sulphate for 3 months if possible. Give advice about eating mixed diet.
4	Other causes of anaemia	Treat the cause. The patient may be pregnant, have heavy periods or an infection goes on for long time.
5	Frequent or severe malaria	<i>If the patient continues to have anaemia after 3 months, examine the abdomen. If you can feel the spleen, give the patient medicine to prevent malaria and ferrous sulphate (at the low-dose) for 3 months.</i>
6	Bleeding from the stomach or intestine	<i>If the patient has black offensive smelling stool (altered blood) or blood mixed in with the stool. A diagnosis and treatment will be needed urgently. Note that iron tablets (eg ferrous sulphate) will turn stool black.</i> <i>Make sure that these patients are not taking aspirin, ibuprofen or any other anti-inflammatory pain killers (eg naproxen or diclofenac). Give patients with black offensive stool omeprazole 20 mg once or twice a day for 5 days and arrange an urgent endoscopy of their stomach and duodenum if possible.</i> <i>If there is blood mixed in with the stool: this may be dysentery - see the diarrhoea lesson. If dysentery is not likely: the patient will need to be seen by a bowel doctor urgently.</i>

LESSON 4 Malnutrition and anaemia Part two

Table 4 summarises the normal doses of ferrous sulphate to use to treat anaemia. If you do not have enough ferrous sulphate, or if your patient gets side effects (such as constipation) with the normal dose, (or prefers to take a lower dose) give a lower dose for 3 months.

Doses of ferrous sulphate Copy Table 4 onto Poster 13.

TABLE 4 Doses of ferrous sulphate

Patient's weight	Dose of ferrous sulphate (200 mg tablets) (or ferrous fumarate 210 mg tablets) to treat anaemia for 3 months	
	Normal dose	Lower dose
15 kg or less	1/4 tablet 2 times a day	1/4 tablet 1 time a day
16-29 kg	1/2 tablet 2 times a day	1/2 tablet 1 time a day
30-44 kg	1 tablet 2 times a day	1 tablet 1 time a day
45 kg and above	1 tablet 3 times a day	1 tablet 1 time a day

SECTION 4: When to send patients to hospital

Give each student a copy of Appendix 6. Make sure that the students know how to use Appendix 6. Ask your students which patients we should send to a hospital or a nutrition clinic. Look for the following answers:

Answer Children with fluid under the skin

Answer Children with a growth line that has gone down at the two most recent weighings

Answer Patients (including pregnant women) with very pale conjunctivae and fast breathing or fluid under the skin

Answer Pregnant women with a haemoglobin of less than 7 g/dl

Suggested 2nd break (possible meal break)

SECTION 5: Practical

Tell the students that the four role plays will help them to practise diagnosis and treatment of malnutrition or anaemia. Divide the class into six groups, with at least three students in each group. In each group, one student will play the doctor, one student will play the patient or the patient's carer, and a third student will be the observer. For each role play:

- Give the patient (or patient's carer) a piece of paper which describes the patient's symptoms and what food he normally eats. If the doctor asks the correct questions, the patient will tell the doctor what symptoms he has and what he normally eats.

LESSON 4 Malnutrition and anaemia Part two

- Give the patient's carer the appropriate growth chart if the patient is less than 5 years old. Give the doctor a piece of paper which tells the doctor what she will find when she examines the patient. The doctor will find out the patient's age and take the patient's history. The doctor will look at the growth chart. She will also use Appendix 6 to decide what the diagnosis and treatment are.
- Give the observer a piece of paper. This piece of paper tells the observer:
 - (1) The diagnosis,
 - (2) The treatment,
 - (3) Advice for the patient, and
 - (4) Whether the patient should be sent to hospital.

After each role play the observer will tell the group what the doctor did correctly and what the doctor could have done better.

Role plays

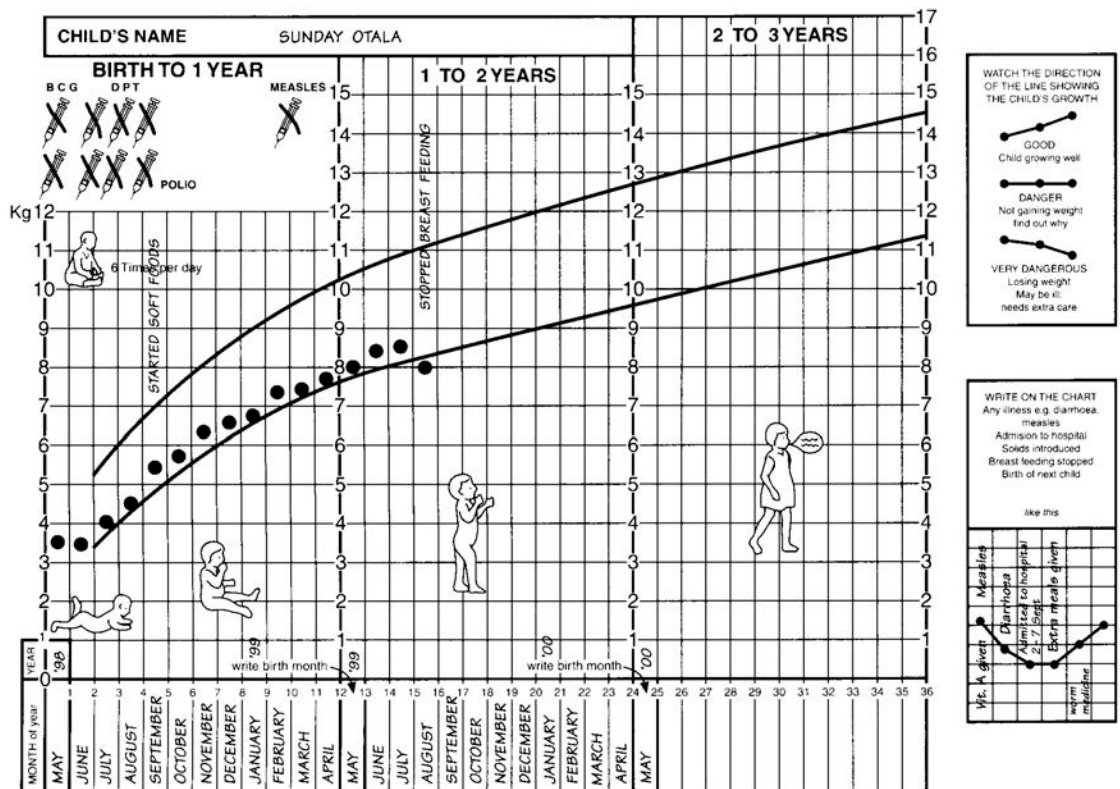
Tell the students that they have 30 minutes to do the first three of the four role plays. A different student should pretend to be the doctor, patient and observer in each role play. Tell them to use Appendix 6. Stop the activity after the third role play.

- Give each group the four role plays.

ROLE PLAY 1:

You are the **carer** of a 15-month-old child, Sunday Ojala. You are pregnant again. You stopped breastfeeding your child a week ago because you think that breastfeeding will harm the unborn baby. You feed the child two times a day, normally rice, maize meal or bread.

You are the **doctor**. You see that the child's conjunctivae are not pale. He does not look unwell but he is crying. There is no fluid under the skin. Ask to look at the growth chart (Picture 11).



PICTURE 11 Growth chart of child in role play 1

LESSON 4 Malnutrition and anaemia Part two

You are the **observer**. The child has early malnutrition. The doctor should take a quick but good history. The doctor should give mebendazole and advise the carer to follow the six rules of good nutrition. The doctor should also advise the carer to start breastfeeding again immediately. Breastfeeding will not harm either the unborn child or the patient.

ROLE PLAY 2:

You are the **patient**. You are a mother aged 28 years. You are 5 months pregnant. You feel dizzy and you have a headache.

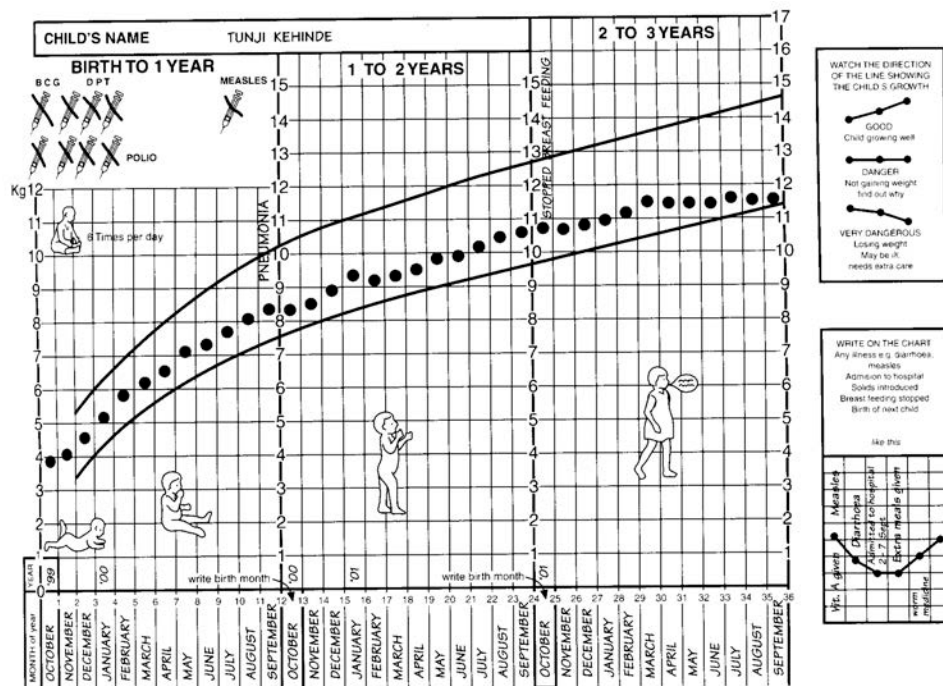
You are the **doctor**. You see that the woman's conjunctivae are pale. She does not have a fever. The patient has a swelling in her abdomen which is the correct size for a 5-month pregnancy. She breathes less than 25 times in a minute and she does not have swollen ankles. You measure her haemoglobin. Her haemoglobin is 8 g/dl.

You are the **observer**. The patient has anaemia. She does not have a fever. She does not need treatment for malaria. The doctor should treat and give advice for hookworm. The doctor should also ask the woman to come back to the health centre after finishing the hookworm medicine. On the next visit, the doctor should advise a mixed diet and give ferrous sulphate until she gives birth.

ROLE PLAY 3:

You are the **mother** of a 3-year-old child, Tunji Kehinde. You do not think that your child has a problem. The child has diarrhoea often. You feed the child three times a day with cassava, maize meal ... 'all the usual foods'.

You are the **doctor**. The conjunctivae are not pale. The child does not smile and has no interest in what is going on around him. The child's legs are swollen. After you press the leg with your finger for 10 seconds, you can see where you were pressing. Ask to look at his growth chart (Picture 12).



PICTURE 12 Growth chart of child in role play 3

LESSON 4 Malnutrition and anaemia Part two

You are the **observer**. The child has kwashiorkor. The doctor should send him to hospital immediately.

If you do not use direct recording scales in your country, cross out the following box and fill in the last two weights on the growth chart in Picture 13. The last two weights have gone down.

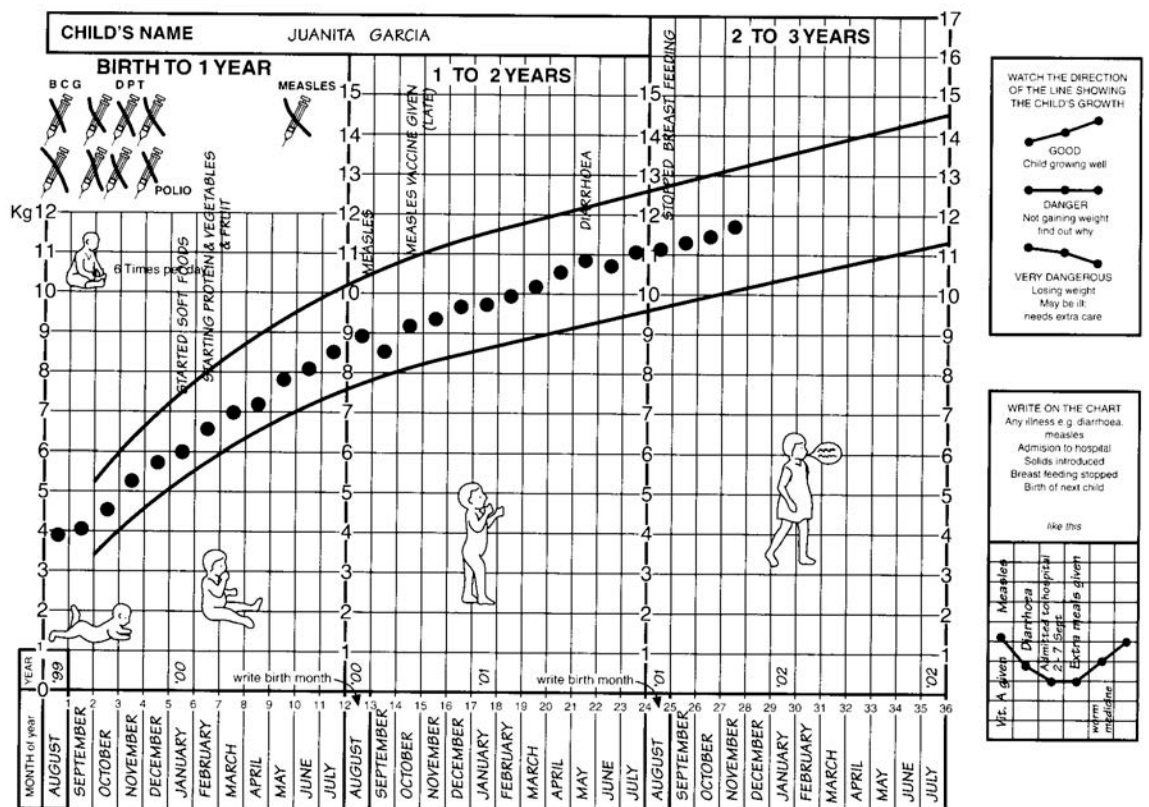
Tell your students that each group in turn will now fill in the last two weights using the direct recording scale. Replace the sling under the direct recording scale with a bucket. (The bucket represents the child being weighed.)

Each group should partly fill the bucket with enough water so that the pointer of the direct recording scale lies over the last weight. Move the scale forward one month. Remove a cupful of water from the bucket. Do not throw this water away. Ask a student to mark the 'child's' new weight. Ask a student to move the scale forward and remove another cupful of water. Ask another student to mark the next weight. Remove the growth chart and allow the group to do the last role play. (Replace the water in the bucket ready for the next group of students.)

ROLE PLAY 4:

You are the **mother** of a 2 year old girl, Juanita Garcia Lopez. The girl has had a fever for 3 days. You feed her rice, cassava, maize porridge and occasionally small fish two times a day.

You are the **doctor**. The conjunctivae are not pale. The child does not smile. The child does not have swollen legs. You look at her growth chart (Picture 13). The growth line has gone down on the two most recent weighings.



PICTURE 13 Growth chart of child in role play 4

You are the **observer**. The child may have severe malnutrition. The doctor should send the child to a nutrition clinic.

SECTION 6: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. What do the following growth lines mean? What will you do for each child? (Refer to the illustrations of the growth lines in the quiz at the beginning of this chapter.)

- *The child is growing well. Tell the mother that the child is growing well.*
- *The child is not growing. Take the child's history. Treat any illness. Teach the mother the six rules of good nutrition.*
- *The child has lost weight. Treat for early malnutrition. If the child has lost weight on the two most recent weighings, send him to the nutrition clinic.*

2. What are the six rules of good nutrition?

- *Breastfeed until second birthday at least six times a day.*
- *Soft foods in addition to breastmilk after 5 months.*
- *Protein foods in addition to breastmilk after 6 months.*
- *Vitamin and mineral foods in addition to breastmilk after 6 months.*
- *Four meals a day in addition to breastmilk after 9 months.*
- *If ill, feed more often. Breastfeed young babies eight times a day or feed five times a day.*

3. What will happen if a child is not given food which follows the six rules of good nutrition?

- *The child may get malnutrition or anaemia. He may get severe malnutrition. Many patients with severe malnutrition die.*

4. What are the causes of anaemia?

- *Malnutrition - lack of iron and folic acid in the diet*
- *Malaria*
- *Hookworm*
- *Frequent pregnancy*
- *Sickle cell disease*
- *Heavy periods - women who bleed heavily every month lose a lot of blood.*

Lesson 5 **Skin problems**

BEFORE THE LESSON

- There are 11 posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared posters: 1
Student answer posters: 2, 4, 7, 8, 10
Summary posters: 3, 5, 6, 9, 11
- For section 2, you may choose to invite four patients to the lesson. For example: one patient with a fungus infection; one with impetigo; one with scabies; and one with a skin ulcer.
- Ask the patients to meet you in the classroom at 8:30 a.m. Tell them that they will be paid expenses for coming. Do not forget to bring some money with you to the lesson.
- Prepare *blank* copies of the five tables under 'Features of skin problems' for each student. Copy the headings only and leave the boxes empty.
- You need a balloon filled with water.
- You need a copy of Appendix 9 for each student.
- You need six copies of the patient case study questions for the practical in section 4.
- Please recommend Common skin diseases in Africa to your students. It is free to access and download at: https://plan-g.at/images/pdf/Common_skin_diseases_in_Africa_ver2017.pdf

Lesson plan

1 Quiz

2 Diagnosis and management of skin problems

3 When to send patients to hospital

4 Practical

5 Answers to the quiz

SECTION 1: Quiz

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

POSTER 1: *(Prepared poster)*

1. For which skin problem would you use each of the following medicines?
 - Benzyl benzoate emulsion
 - Whitfield ointment
 - Co-trimoxazole
 - Gentian violet
2. How do you diagnose measles?
3. If a patient has new dark red spots in the skin, what should you do?

SECTION 2: Diagnosis and management of skin problems

Give each of your students one blank copy of Tables 1 to 5 (see pages 94-97). Students should complete their blank tables with the correct answers after each problem has been discussed. If possible, show the students each important feature on a patient.

Today we will learn about skin problems that are caused by:

- virus infections
- bacterial infections
- fungus infection
- insects
- allergies.

POSTER 2:
(Student answer poster)

Features of skin problems - Virus infections

Draw the lines and headings only of Table 1 (on p. 79) on Poster 2. For each skin problem, we will fill in the appropriate table. You can put the finished tables on your health centre wall.

Virus infections

Three viruses that can cause a skin rash or swelling are:

- measles
- chickenpox
- warts.

Measles

Measles starts with a runny nose, sticky eyes, a fever and a cough. A few days later a flat red rash appears behind the ears. Next, the rash becomes slightly raised and spreads to the face and body. The areas of redness meet together. The rash lasts for 6 or 7 days. The rash does not itch. The fever disappears soon after the rash has appeared, usually within 3 days. The patient may also have red eyes.

If a patient has a fever and a rash all over his body, he may have measles. The rash does not itch.

Diagnose measles if the patient also has red eyes, or a cough, or fluid coming from the nose.

Treat a patient with measles as described in Lesson 3 (also see the picture of the measles rash on page 34):

- Look for chest illnesses.
- Look for corneal ulcers.
- Do not give tetracycline eye ointment for conjunctivitis unless a cornea is not clear.
- Give vitamin A.
- Give the first-line malaria treatment if there is malaria in your area.
- Show the carer how to do tepid sponging.
- Advise the carer to continue to breastfeed.
- Advise the carer to give a mixed diet of mashed food five times each day. She should do this until the child is well again and for a week after he is better.

Ask the students what to write in each space of the measles row of Table 1. Fill in the correct answers on Poster 2. Students should fill in the correct answers in their blank Table 1.

Chickenpox The first symptoms of chickenpox are a rash and a fever. The rash quickly turns into small blisters on the body and under the hair. Next, blisters appear on the face, arms and legs. The blisters are very itchy. Many patients scratch the blisters and damage the skin. This can cause impetigo (infection with bacteria). Treat impetigo if it is bigger than 1 cm wide.

Advice for patients with chickenpox

POSTER 3:
(Summary poster)



An adult with Chickenpox

1. **Cut your fingernails.** Long fingernails damage the skin if the patient scratches her skin.
2. **Wash** frequently to prevent impetigo.
3. **Give home treatment advice.**
 - Give plenty of **fluids**. **Do not give ibuprofen.**
 - Continue to **feed** at least **five times a day**.
 - Tell the patient to **return**:
 - **if** they are **not able to drink**
 - **if** their **breathing** becomes **difficult or fast**
 - **if** they become **more ill**.

Now ask the students what to write in each space of the chickenpox row of Table 1. Fill in the correct answers on Poster 2. Students should fill in the correct answers in their blank Table 1 (see page 92).

Warts The wart virus causes warts on the skin, often on the hands or feet. Warts are normally the same colour as the skin. They are often raised above the surrounding skin. Warts do not itch. It may take months, or years, for warts to disappear, but warts do not need any treatment. Ask the students what to write in each space of the warts row of Table 1. Fill in the correct answers on Poster 2. Students should fill in the correct answers in their blank Table 1.



A wart on an ear



Treating warts with duct tape

Pruritic papular eruption of HIV. Pruritic means itchy. Papules are small lumps in the skin. This skin condition affects 30% of HIV patients, and is often the first thing that is noticed by patients and clinicians. It does not affect the webspace between the fingers (unlike scabies). It usually gets better soon after ART is started. Antihistamine tablets can help the itch, but are not a cure.



Pruritic papular eruption of HIV





Molluscum contagiosum
A pox virus



A cold sore
Herpes simplex virus

Bacterial infections

Bacterial infections that can affect the skin include:

- impetigo
- skin ulcers
- abscess
- meningococcal septicaemia
- serious skin infections in children less than 2 months old.

POSTER 4:

(Student answer poster)

Features of skin problems - Bacterial infections

Draw the *lines and headings only* of Table 2 (on pages 93-94) on Poster 4

Impetigo

Impetigo starts as a blister that quickly gets bigger and breaks. The skin becomes wet and red and dries to form a yellow coloured area. Impetigo is most common on the face, hands and feet. People get impetigo by touching the skin of a person who has impetigo. A person is more likely to get impetigo if he has scabies, flea bites or does not wash often. Impetigo does not cause a fever and is not painful but it can be uncomfortable. If the area underneath the skin becomes infected, the patient has cellulitis. A patient with cellulitis may have a fever and the skin is painful to touch.

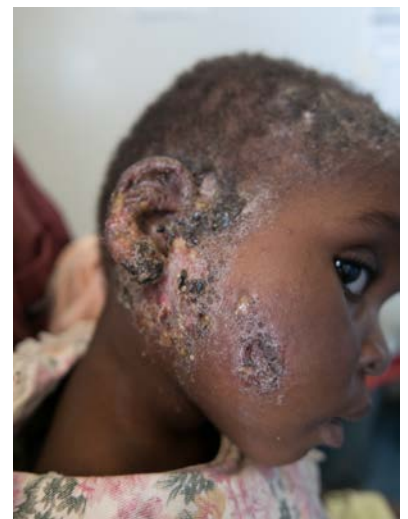
Treat a patient with impetigo as follows:

- If the impetigo is smaller than 10 cm wide, paint it with gentian violet once a day for 5 days. Fusidic acid cream is an alternative.
- If the impetigo is bigger than 10 cm wide, treat with co-trimoxazole. at the normal dose, for 5 days. Flucloxacillin or cloxacillin are alternatives.
- If there is cellulitis, give co-trimoxazole, at the normal dose, for 5 days.

Advise a patient with impetigo to:

1. Cut their fingernails.
2. Come back if their skin becomes more painful or they develop a fever.
3. Wash every day and to eat a mixed diet.

Ask the students what to write in each space of the impetigo row of Table 2. Fill in the correct answers on Poster 4. Students should fill in the correct answers in their blank Table 2.



Impetigo

Skin ulcers If a skin wound does not heal, a skin ulcer develops. Bacteria in the wound, malnutrition or diabetes may stop a wound from healing. Patients with leprosy may have many wounds and skin ulcers. Skin ulcers are normally on the feet and ankles.

How to treat skin ulcers

POSTER 5:
(Summary
poster)

Treat skin ulcers like this:

1. Wash the ulcer **every day** if possible.
2. On the **first visit**:
 - Clean the ulcer. Squirt **normal saline or clean water** quickly at the ulcer **using a syringe**.
 - Do this again and again until all the dirt has been removed.
 - Next, put **povidone iodine on the ulcer**.
3. On the second visit, and **further visits**:
 - Clean the ulcer very gently. Do not damage the healing red skin.
 - **Gently** remove the yellow or green matter from the ulcer using a sterile swab or cloth. Dip the cloth in **normal saline or povidone iodine 10%**.
4. **Cover** the ulcer each day with a clean dressing. Consider using unripe slices of **papaya** flesh underneath the dressing bandage as an antiseptic if possible. Otherwise use povidone iodine 10%.
5. **If** the skin around the ulcer is **painful** to touch, the patient has **cellulitis**. Treat the patient with co-trimoxazole at the normal dose, for 5 days. Amoxicillin is an alternative.
6. Make sure that the patient has been immunised against tetanus. If she has not, give a **tetanus toxoid vaccination** this week. Give two more tetanus toxoid vaccinations, with a month between each injection. This will not prevent the patient from getting tetanus from the ulcer she has now, but it will prevent tetanus in future. The vaccine starts to work after 3 months and gives protection for 10 years or more.
7. **If** a skin ulcer is **no better after 2 weeks** of treatment, send the patient to **hospital**. The patient may need treatment for another cause of the ulcer, for example diabetes, malnutrition or cutaneous leishmaniasis. The edges of a cutaneous leishmaniasis ulcer are raised.

Now ask the students what to write in each space of the skin ulcers row of Table 2. Fill in the correct answers on Poster 4. Students should fill in the correct answers in their blank Table 2.

Abscess An abscess is a type of bacterial infection underneath the skin. The body uses white blood cells to fight against the infection. Dead white blood cells collect to make a lump filled with yellow matter called pus. An abscess is warm and painful when you touch it. It often feels like a balloon that is full of fluid. Use a balloon filled with water to show your students what it feels like to touch an abscess. Ask the students to place two fingers on the balloon and to press one of the fingers down into the balloon. The balloon pushes the second finger upwards. Women who are breastfeeding often get an abscess in a breast. Breast abscesses develop if the baby does not take the nipple all the way into the mouth when he is breastfeeding. This damages the skin of the nipple. Bacteria can get into the damaged skin and may cause an abscess.

POSTER 6:
(Summary
poster)

How to treat an abscess

Treat an abscess as follows:

1. Cut into the abscess with a **sterile knife**.
2. Clean the pus out of the abscess.
3. Put a **sterile swab**, which has been dipped in **normal saline** or **povidone iodine 10%**, as far **into the hole** as possible.
4. Leave a new sterile swab in the opening of the hole.
5. The wound will heal from the inside. Keep the hole open, this will allow you to clean the inside of the wound.
6. Consider treating the patient with **co-trimoxazole**, at the normal dose, for 5 days.
7. Gently **remove** all of the **swabs** from the wound **every second day**. Put new sterile swabs back in.

If the abscess is in a breast:

1. Make the cut in a line pointing away from the nipple.
 2. Express breastmilk frequently from that breast, every 4 hours, by holding the breast firmly and gently squeezing the nipple between the thumb and a finger.
 3. Use a cup and spoon to give the milk to the baby. Do not give the milk if it has a lot of pus in it.
- If a breast is hot and painful to touch but does not yet feel like a balloon, put a large needle into the lump. Pull the plunger of the syringe: if pus comes out make a cut in the breast.
 - If there is no pus, give the woman co-trimoxazole at the normal dose. See the woman again after 2 days.

Now ask the students what to write in each space of the abscess row of Table 2. Fill in the correct answers on Poster 4. Students should fill in the correct answers in their blank Table 2.



Abscesses in the armpit caused by Hidradenitis suppurativa

Meningococcal septicaemia We will talk about meningococcal septicaemia later in this lesson.
Leave space in your blank Table 2.

Serious skin infections in children less than 2 months old

Young babies can become ill and die very quickly. Young babies with serious infections may not always have a general danger sign. Look for a fever. Look at the skin and at the umbilicus in the middle of the baby's abdomen.

If the young baby has:

- pus coming from the umbilicus, or redness of the umbilicus, *and* a fever
- many or large areas of pus under the skin

Give him an intramuscular injection of ceftriaxone. Give 50 mg for each kg of body weight. Send him to hospital immediately.

If the young baby has:

- pus coming from the umbilicus, but no fever
- redness of the umbilicus, but no fever
- only small areas of pus under the skin

Give him co-trimoxazole, 1/2 tablet two times a day, for 5 days. See the child again after 2 days.

Ask the students what to write in each space of the row for serious skin infections in children less than 2 months old in Table 2. Fill in the correct answers on Poster 4. Students should fill in the correct answers in their blank Table 2.

Fungus infections

POSTER 7:
(Student answer poster)

Features of skin problems - Fungus infections

Draw the *lines and headings only* of Table 3 (p. 81) on Poster 7.

Fungus infections that affect the skin are:

- tinea
- yeast infections.

Tinea Tinea is a fungus infection. It can grow anywhere on the skin. Tinea starts as a scaly, slightly raised pale or red patch. The skin is not painful when you touch it. The rash may be itchy. As the infection grows, the skin in the middle of the rash may become normal again. The infection then looks like a ring. Tinea causes hairs to fall out of the skin. Treating tinea takes a long time. The medicine you use will depend on what is available locally.

- Rub miconazole or Whitfield ointment (benzoic acid and salicylic acid ointment) into the skin once a day for several weeks. Advise the patient to continue using the ointment until the rash has completely disappeared and for one extra week.
- If the problem is no better after 4 weeks, send the patient to the leprosy clinic. Leprosy can also cause the skin to look pale and scaly.
- If the tinea is in the hair on the scalp, skin treatments will not help unless it is acceptable to shave the hair. Medicine taken by mouth would be necessary - for example griseofulvin.

LESSON 5 Skin problems



Tinea between the toes

Pityriasis versicolor
Anti-fungal shampoo, or cream,
for 7 days will often work.
Although the skin can look pale
for several weeks.



Give the students a copy of Appendix 9.

Ask the students what to write in each space of the tinea row in Table 3. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Yeast infections Yeasts are a special type of fungus. Yeasts grow in warm, wet areas of the body. Yeast infections are found between the toes, near the private parts, under the breasts and under the arms. The skin will be slightly wet. The skin may be white or red. Treat yeast infections with gentian violet or a fungus treatment such as clotrimazole cream. Give this every day until the rash has completely disappeared, and for one extra week after that.

Ask the students what to write in each space of the yeasts row in Table 3. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Seborrhoeic dermatitis Seborrhoeic dermatitis is a flakey skin condition that especially affects the areas on either side of the nose and the eyebrow area. It also affects the area over the breast bone. Clotrimazole cream once (or twice) a day will control the symptoms.



Seborrhoeic dermatitis

Insects

POSTER 8:
(Student answer poster)

Features of skin problems: Insect problems

Draw the *lines and headings only* of Table 4 (p. 81) on Poster 8.

Skin problems caused by insects are:

- flea bites
- body lice infestation
- scabies.

Flea bites Fleas live in the homes of people and on animals. Flea bites are itchy. If people scratch the bites, this can damage the skin and cause impetigo. Advise patients with flea bites to clean their home. Tell them to put insecticide powder on floors and bedding if possible. But this may need to be repeated each 2 weeks for 6 months. Vacuuming regularly will help. Wash bed clothes in hot water with detergent. Pets should be groomed



Flea bites

regularly and suitable insecticides used on their bodies. Insecticides should not be used on people, but if you think they have scabies an anti-parasite preparation can be used (for example benzyl benzoate emulsion or ivermectin).

Ask the students what to write in each space of the flea bites row in Table 4. Fill in the correct answers on Poster 8. Students should fill in the correct answers in their blank Table 4.

Body lice infestation Body lice live in people's clothes. Body lice cause an itchy rash on most parts of the body. This rash is similar to the itchy rash caused by scabies. Because of this: consider treating the skin with benzyl benzoate emulsion. But more importantly: Advise the patient to wash their clothes in very hot water and to iron the clothes, including their underwear. (Advise the patient that head lice can be treated with wet combing, permethrin cream or with oral ivermectin.)

Ask the students what to write in each space of the body lice row in Table 4. Fill in the correct answers on Poster 8. Students should fill in the correct answers in their blank Table 4.

Scabies Scabies is very common. It is caused by a tiny insect that lives underneath the skin. A patient with scabies has scaly skin, often at the wrists or between their fingers. They may have an itchy rash over most of their body. Treat the skin with benzyl benzoate emulsion. Ivermectin taken by mouth (200 micrograms per kilogram taken once) is also effective for scabies, but a second treatment may be needed after 3 weeks. A person with scabies may also get impetigo. If they have impetigo, treat the impetigo first. Then use benzyl benzoate emulsion to treat the scabies. Tell the patient to cut their fingernails to avoid further skin damage.

How to treat scabies

POSTER 9:
(Summary
poster)

Treat scabies as follows:

- Treat **everyone in the house**. Some people have scabies without having symptoms.
- Use one **100 ml** bottle of **benzyl benzoate (25%) to treat two adults** or children over the age of 5 years.
- If the patient is **under the age of 2 years mix** the benzyl benzoate **with an equal amount of water**.
- Put benzyl benzoate on all parts of the body, except for the face and head .
- **Leave** the medicine on for **24 hours** .
- **Repeat** this treatment **on 2 consecutive days**.
- An alternative is ivermectin 200 micrograms/kg on one occasion
- Treatment will kill all the scabies insects, but the skin will still itch for up to 2 weeks.
- If the rash is no better 3 weeks after treating the whole family, there may be another cause of the skin rash. In areas where there is river blindness, the rash may be caused by onchocerciasis. Treat adults with ivermectin 6 mg once a year. This will help to prevent blindness but it will not help the skin rash of onchocerciasis.

Ask the students what to write in each space of the scabies row in Table 4. Fill in the correct answers on Poster 8. Students should fill in the correct answers in their blank Table 4.

Allergy problems

POSTER 10: Features of skin problems - Allergy problems

(Student answer poster) Draw the *lines and headings only* of Table 5 (p. 82) on Poster 10.

Allergy problems that can cause a skin rash are:

- reactions to medicines
- eczema.

Reaction to medicines Injections, tablets or ointments can cause skin rashes. Antibiotics and phenobarbital commonly cause rashes. Allergic rashes are often itchy, but are not usually scaly. If a rash starts or gets worse after using any medicine, stop the medicine immediately if possible.



Drug allergy to TB medication



A widespread skin reaction to a medicine



Ask the students what to write in each space of the reactions to medicines row in Table 5. Fill in the correct answers on Poster 10. Students should fill in the correct answers in their blank Table 5.

Eczema

An eczema rash is itchy and scaly. Eczema often causes a rash at the front of the elbows, behind the knees, and on the face. It also causes dry skin. Eczema is difficult to treat. Tell the patient that you will not be able to cure eczema. To treat skin dryness, put natural oils, such as coconut oil, on the skin **every** day. Tell the patient not to use perfumed soap and to avoid using soap frequently. Soap removes oils from the skin. If the eczema is very itchy, put hydrocortisone cream 1 % on the affected areas two times a day until the itch is better.

Ask the students what to write in each space of the eczema row in Table 5. Fill in the correct answers on Poster 10. Students should fill in the correct answers in their blank Table 5.



Eczema

Tables 1-5: Features of skin problems

TABLE 1 Features of skin problems - Virus infections

	Rash	Where	Other features	Sometimes	Advice	Treatment
Measles	<ol style="list-style-type: none"> 1. Flat then slightly raised 2. Red 3. Does not itch 	<p>Starts behind ears Goes to face and body Goes to all parts of the body</p>	<p>Fever Has one or more of: (a) cough (b) conjunctivitis (c) fluid from the nose</p>	<ol style="list-style-type: none"> 1. Pneumonia 2. Corneal ulcer 	<p>Home treatment Breastfeed Soft mixed diet 5 times a day Tepid sponge</p>	<p>Vitamin A Test for malaria. Send to hospital if has pneumonia</p>
Chickenpox	<ol style="list-style-type: none"> 1. Itchy 2. Blisters 	<p>Starts on the body and in hair Goes to arms and legs</p>	<p>Fever</p>	<p>Impetigo</p>	<p>Cut nails Wash daily Home treatment</p>	<p>Test for malaria. No other medicine Treat if has pneumonia</p>
POSTER 11: (Prepared poster)						
Pruritic papular eruption of HIV	<ol style="list-style-type: none"> 1. Itchy 2. Small lumps 	<p>Especially exposed skin and arms and legs</p>	<p>Not palms, soles and web spaces</p>		<p>Consider antihistamines for the itch</p>	<p>Antiretroviral treatment</p>
Warts	<ol style="list-style-type: none"> 1. No colour 2. Raised 3. Not itchy 4. Hard and dry 	<p>Usually hands or feet</p>	<p>None</p>		<p>Warts will go away after several months or years</p>	<p>None</p>

TABLE 2 Features of skin problems– bacterial infections

	Rash	Where	Other features	Sometimes	Advice	Treatment
Impetigo	Blisters, then wet red skin, then yellow matter	Face, hands or feet	None	Cellulitis	Cut nails Wash daily Home treatment Return if develops fever or pain	Gentian violet if less than 10 cm co-trimoxazole or cloxacillin if more than 10 cm co-trimoxazole or cloxacillin if tender
Skin ulcers	1. Skin broken 2. Red, yellow or green matter in wound	Ankles and feet	None	Cellulitis	Keep dry and change dressing daily	Wash and dress every day. Use povidone iodine or unripe papaya under dressing. Tetanus vaccine. Treat any cellulitis.
Abscess	1. Hot and painful to touch 2. Feels like a balloon	Breast or anywhere	Fever		Come to health centre every second day Express breastmilk and give to child with cup and spoon	Cut and clean co-trimoxazole
Meningococcal septicaemia	Dark red spots that do not disappear when pressed	Anywhere	Unwell, often a general danger sign			Intramuscular benzylpenicillin and send to hospital immediately
Serious skin infections in child less than 2 months	1. Pus or red umbilicus and fever 2. Large area of pus under skin	Anywhere, often umbilicus	Fever or any general dangerous sign			Intramuscular ceftriaxone Send to hospital immediately .

TABLE 3 Features of skin problems – Fungus infections

	Rash	Where	Other features	Sometimes	Advice	Treatment
Tinea	1. Scaly with hair loss 2. Slightly raised 3. Not numb (test with cotton wool)	Anywhere	None		Go to leprosy clinic if no better after 4 weeks or if numb	Whitfield ointment or other treatment for fungus
Yeasts	Red, smooth and slightly sore	Between fingers, toes, under breasts, armpits and next to private parts or in nappy area			Clean with soap and water and dry. Consider zinc oxide ointment to keep dry.	Gentian violet or treatment for fungus
Seborrhoeic dermatitis	1. Scaly 2. Slightly raised	Either side of nose, eyebrows, over breast bone			Test for HIV	Clotrimazole cream daily

TABLE 4 Features of skin problems – insect problems

	Rash	Where	Other features	Sometimes	Advice	Treatment
Flea bites	Itchy spots	Anywhere		Impetigo	Clean home. Insecticide dust on floors, bedding and clothes	None
Body lice	Itchy rash	All parts of body			Wash clothes in very hot water or use hot iron How to use benzoyl benzoate	Benzyl benzoate emulsion for whole family (Ivermectin is not effective)
Scabies	1. Scaly 2. Itchy	Wrists Between fingers Anywhere but very rarely face or scalp	Itchy rash on all parts of body	Impetigo	Cut nails How to use benzoyl benzoate Return if no better after 3 weeks	Topical benzoyl benzoate or oral ivermectin for whole family (not in pregnancy)

TABLE 5 Features of skin problems- Allergy

	Rash	Where	Other features	Sometimes	Advice	Treatment
Reaction to medicine	1. Often itchy 2. Dark or red 3. Often blisters	One area, all of the body		Anaphylaxis and death	Stop medicine	Treat anaphylaxis
Eczema	1. Itchy 2. Scaly	Front of elbows, behind the knees, neck and face			Use coconut oil every day. Do not use perfumed soap	1% hydrocortisone cream

Refreshment break

SECTION 3: When to send patients to hospital

When to send patients with skin problems to hospital

Send patients with skin problems to hospital immediately if:

1 They have **pneumonia and measles**. Give patients with pneumonia and measles an intramuscular injection of procaine penicillin fortified (0.1 million IU for each kg of body weight up to 1.2 million IU, one time). Pneumonia is very dangerous to patients who have measles.

2 They have **meningococcal septicaemia**. If a patient has new, dark red spots in the skin, press on the spots with two fingers. Separate the two fingers. If the **dark red spots do not disappear when you press on the spots**, treat the patient for meningococcal septicaemia. Give her an intramuscular injection of benzylpenicillin (0.1 million IU for each kg of body weight, up to 2 million IU, one time). If the patient is not able to get to the hospital immediately, give benzylpenicillin four times a day.

Show the students how to press on the spots with two fingers. Ask the students what to write in each space of the meningococcal septicaemia row of Table 2.

3 **A serious skin infection in a child aged less than 2 months**. Give the child an intramuscular injection of ceftriaxone (50 mg for each kg of body weight one time).

Also send these patients to hospital:

- If a skin ulcer is no better after 2 weeks of treatment. The patient may have diabetes, malnutrition or cutaneous leishmaniasis .
- If a rash is no better after 4 weeks of treatment with a fungus treatment, send them to the leprosy clinic.

SECTION 4: Practical

ACTIVITY:

Divide the students into three groups. Give two copies of the following patient case studies to each group. Tell the students that they will use their five tables of the features of skin problems to decide which skin problem each patient has.

Using the tables, they should:

- make sure that the *rash* is the correct type
- check *where* the rash is
- see what *other features* the patient has.

Tell the students that they have 15 minutes to answer the questions about three patients. If the type of rash, the location of the rash and other features are correct, they have made the diagnosis.

Patient 1

A 4-year-old girl has an itchy rash on her body and in her hair. The girl has a slight fever. She does not have a cough or difficult breathing. Her eyes look normal. Some areas of skin have blisters.

1. What skin problem does she have?
2. What other illness may she have?
3. What is the correct treatment?

Patient 2

A 35-year-old woman complains of swelling and pain in her left breast. She has a 2-month-old baby. The woman has a fever and a hot swelling on her left breast. The skin is painful and feels like a balloon when you touch it.

1. What skin problem does she have?
2. What treatment would you give her?
3. What advice will you give her?

Patient 3

An 11-year-old boy fell on some rocks 2 days ago. The boy has an ulcer on his left shin which looks very dirty.

1. What will you do?
2. He comes back to your health centre 7 days later. When you touch the skin on his left shin, he tells you that it is painful. How will you treat him?

Ask a different student in each group to tell you the answers for each patient. Tell the students what was good about their answers.

Tell the students the correct answers. The correct answers are below:

Answers

- Patient 1**
1. Chickenpox
 2. Possibly malaria
 3. Give the girl the first-line malaria treatment in malaria areas. Cut her fingernails. Advise her carer to wash her daily. Give the carer advice about home treatment.
- Patient 2**
1. Breast abscess.
 2. Cut into the abscess and clean it. Treat the woman with co-trimoxazole, 2 tablets two times a day, for 5 days.
 3. Advise her to express breastmilk and give it to the child with a cup and spoon.
- Patient 3**
1. Wash and dress the ulcer every day. Use povidone iodine or unripe papaya under the dressing. Make sure that the patient has already been immunised against tetanus. If not, give him a tetanus toxoid vaccination this week. Give two more tetanus toxoid vaccinations, with a month between each injection.
 2. The boy has cellulitis, give him co-trimoxazole, at the normal dose, for 5 days.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. For which skin problem would you use each of the following medicines?
Benzyl benzoate emulsion
 - *Scabies*Whitfield ointment (benzoic acid and salicylic acid ointment)
 - *Tinea or yeast infection*Co-trimoxazole
 - *Cellulitis*
 - *Abscess, after making a cut*
 - *Impetigo, if the area affected is more than 10 cm wide*Gentian violet
 - *Yeast infections, impetigo (if the area affected is less than 10cm wide)*
2. How do you diagnose measles?
 - *Think of measles if a patient has a fever and a rash all over his body. The rash does not itch.*
 - *Diagnose measles if the patient also has red eyes or a cough or fluid coming from the nose.*
3. If a patient has new dark red spots in the skin what should you do?
 - *Press on the spots with two fingers. Separate the two fingers. If the dark red spots do not disappear, when you press on them, treat the patient for meningococcal septicaemia.*
 - *Give her an intramuscular injection of benzylpenicillin.*
 - *Send the patient to hospital immediately.*

Lesson 6 **Diarrhoea**

BEFORE THE LESSON

- There are six posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared poster: 1, 3, 4, 5
Student answer posters: 2, 6
- Ask one student to help you with the demonstration tutorial in this lesson. Give the student a copy of Appendix 10. If possible, practise with him before the lesson.
- Ask a different student to volunteer to teach the class. Make a copy of the 'Demonstration - What to teach village leaders' on page 107 and give it to the volunteer student. Ask her to practise with you before the lesson.
- Give each student a copy of Appendix 10.
- Prepare copies of the role plays. Write the information for the patient, the doctor and the observer on separate pieces of paper. Use a paper clip to keep each role play together. You need one copy each for six groups of students.
- Give each student a copy of Appendices 11 and 12.
- If there is polio in your area, give each student a copy of Appendix 13.

Lesson plan

1 Quiz

2 Diagnosis and management

3 When to send patients to hospital

4 Practical

5 Answers to the quiz

SECTION 1:

Quiz

POSTER 1:
(Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. When should you use antibiotics to treat patients who have diarrhoea?
2. What are the causes of diarrhoea?
3. How can you tell if a patient is dehydrated?
4. When should patients with diarrhoea be sent to hospital?

SECTION 2: Diagnosis and management

A patient with diarrhoea passes loose or watery faeces three or more times in a day. Diarrhoea is dangerous because loose or watery faeces contain a lot of water. If a patient loses a lot of water, they may become dehydrated and may die. Diarrhoea is most common in children aged between 6 months and 18 months. Diarrhoea often kills these children.

Causes of diarrhoea

POSTER 2:
(Student answer poster)

Tell the students that today they will learn how to prevent and treat diarrhoea.

Causes of diarrhoea

Ask the students what causes diarrhoea.

Bad hygiene - bad hygiene allows the infections which cause **gastroenteritis** to pass from one person to another person. Gastroenteritis is an infection with bacteria, viruses or parasites which causes diarrhoea.

Bacteria - some **bacteria grow in food** that has been left for a long time before eating. These bacteria cause **food poisoning**. Food poisoning often causes vomiting and/or diarrhoea. If food has been left for 8 hours or more, cook it again. Boil the food for at least 5 minutes.

Malnutrition makes a patient more likely to get infections that cause diarrhoea.

Any illness which causes a **fever**, for example malaria, pneumonia, tonsillitis, measles and otitis media can cause diarrhoea.

Any **severe illness**, for example appendicitis and intussusception, can cause diarrhoea. Make sure that patients with diarrhoea do not have peritonitis.

Giardia. A parasite bowel infestation caused by drinking contaminated water tends to cause long standing relatively mild symptoms with a slow onset. Consider it with patients who have had symptoms for more than 2 weeks especially if they experience bloating and produce more wind (farting) or if the faeces is fatty.

Taking a history and examination

Give each student a copy of Appendix 10. Give a copy of the demonstration to the student who will help you with the demonstration. Ask him to play the part of a student. You will play the student's trainer. Read to the class slowly and in a loud voice. Ask the class to watch and listen to the demonstration.

POSTER 3:
(Prepared poster)

Four questions for patients with diarrhoea

Copy the four questions from the boxes on page 102 onto Poster 3.

Demonstration

Student: What should I do when I see a patient with diarrhoea?

Trainer: Appendix 10 will help you treat patients with diarrhoea. Start at the top left. The treatment for diarrhoea depends on the answers to four questions (as well as knowing their HIV status and what medication they have been taking) and the examination of the patient. First, tell me why each question is useful.

The first question is: **How many times have you passed faeces this morning?**

Student: If a patient passes loose or watery faeces three times or more in a day, they have diarrhoea. If a patient has passed very watery faeces six times or more today, they may have cholera.

Trainer: Excellent.

The second question is: **Do you have a fever?**

Student: The patient may need treatment for the problem which causes the fever. Malaria, pneumonia, tonsillitis, measles and otitis media cause a fever and sometimes cause diarrhoea.

Trainer: Good.

The third question is: **Is there any blood in your faeces?**

Student: If there is blood in the diarrhoea, the patient usually has dysentery.

Trainer: Correct.

The fourth question is: **For how long have you had diarrhoea?**

Student: If the patient has had diarrhoea for 2 weeks, they have persistent diarrhoea.

Trainer: Excellent. Then, examine the patient. Next, make sure that they do not have a general danger sign .
If the patient has a general danger sign, treat this first.
If the patient has blood in their faeces or pain in their abdomen, examine their abdomen. If there is no guarding or rebound tenderness, the patient does not have an abdominal problem.
Treat them for dysentery.
How can we tell if a patient is dehydrated?

Student: If a patient is dehydrated, his mouth is dry. If we pinch a fold of the patient's skin and let go, the skin goes back slowly. If the patient is very dehydrated, the skin takes more than 2 seconds to become flat again.

Trainer: Good. Children with severe malnutrition also have very loose skin on the abdomen. Pinch a fold of skin over a bone. If you think a patient may be dehydrated, or have severe malnutrition, ask what colour his urine is. If the patient is dehydrated, the urine will be dark yellow and they will have passed urine only one time or no times this morning. Remember that old people lose the elastic tissue in their skin and the skin will take more than 2 seconds to go back

even they are not dehydrated. Look for eyes that are more sunken than usual and a mouth that looks dry.

Treatment

Trainer: Patients with diarrhoea need treatment to prevent, or to treat, dehydration and to prevent malnutrition. Patients often get malnutrition after they have had diarrhoea.

Immediate treatment after examination

Trainer: Give a patient with dehydration oral rehydration solution. Give 20 ml of the solution for each kilogram of body weight every hour. Give the solution in small amounts. Children who also have malnutrition should be given ReSoMal (Rehydration Solution fo MALnutrition) instead of normal oral rehydration solution. Normal ORS has too much sodium in and too little potassium in for children with malnutrition. ReSoMal also has more glucose, zinc and magnesium.
Can you tell me for how long we should treat patients?

Student: *Treat patients with severe dehydration for 6 hours using a nasogastric tube.
Treat patients with some dehydration for 4 hours using a cup and spoon.*

Trainer: Very good. For example: A 10-kg child will need 200ml of the solution in each hour. If the child has some dehydration, give a total of 800 ml in 4 hours. If the child has severe dehydration, give a total of 1200 ml in 6 hours.
Treat patients with a *general danger sign* for a very severe febrile disease. Also give a patient who has a general danger sign and diarrhoea 5 ml of oral rehydration solution every minute on the way to the hospital. Use a cup and spoon or a nasogastric tube with a syringe.
If a patient has had diarrhoea six times or more this morning, they may have *cholera*. Cholera is a bacterial infection from eating or drinking contaminated food or water. The diarrhoea usually looks like rice water and has a fishy smell. Usually there is no abdominal pain, but there may be vomiting.

- Give oral rehydration solution for 4 to 6 hours. If the patient is no better, send them to a cholera centre.
- Give the first-line antibiotic for cholera 4 to 6 hours after starting treatment with oral rehydration solution. Give antibiotics for 3 days.
- If the patient has bloody diarrhoea (fresh red or pink), but no serious abdominal problem, they usually have dysentery. Treat with one of the antibiotics from table 1.
- Treat patients with malnutrition. See appendix 6.
- If dysentery has not improved after 5 days of treatment, consider treating for amoebic dysentery. Inflammatory bowel disease and bowel cancer are other possibilities. Some countries have schistosoma mansoni or schistosoma japonicum and stool can be examined for their eggs.

POSTER 4:*(Prepared poster)***Antibiotic treatments for dysentery**

Copy Table 1 onto Poster 4.

TABLE 1 Antibiotic treatments for dysentery

Option	Comments
ciprofloxacin orally for 3 days Children: 15 mg/kg x 2/ day (max. 1 g daily) Adults: 500 mg 2 times daily	Ciprofloxacin should not be used in pregnancy unless no other suitable antibiotic is available.
azithromycin orally for 3 days Children: one dose of 12 mg/kg on day one then 6 mg/kg once daily for 4 more days Adults: one dose of 500 mg on day one then 250 mg once daily for 4 more days	
cefixime orally for 3 days Children: 8 mg/kg once daily (max. 400 mg daily) Adults: 400 mg once daily	
ceftriaxone intramuscularly for 3 days Children: 50 to 100 mg/kg once daily (max. 1 g daily) Adults: 1 to 2 g once daily	Use this option if the patient has a general danger sign or needs to be admitted to hospital

Continue with the demonstration:

Student: Can I treat all patients with diarrhoea with antibiotics?

Trainer: No. Only use antibiotics to treat diarrhoea if the patient has dysentery or cholera.

Student: I've heard of treating people with zinc. Is that right?

Trainer: Yes, everyone with short term diarrhoea (especially children under 5 years) should be given 10 mg of zinc for 10 days. It reduces how long the diarrhoea goes on for. You don't need to use a higher dose, even for adults. (20 mg is more likely to cause vomiting.)

All patients with cholera should be given zinc. Only use antibiotics for cholera when the vomiting has stopped and they are well hydrated (producing good amounts of urine). A single dose of doxycycline, azithromycin or ciprofloxacin are the options.

Student: How should we treat a patient with persistent diarrhoea?

Trainer: If the patient is not dehydrated, teach him about home treatment, treat them for Giardia with metronidazole (Adult dose: 400 mg three times a day for 5 days). Ask him to go to the hospital if he has not started to improve within 2 weeks. If a patient with persistent diarrhoea is dehydrated, treat the dehydration first, then send him to hospital immediately. If a patient has had diarrhoea for 4 weeks or more they should be encouraged to have an HIV test.

Treatment after 4-6 hours

Student: What do you do after giving the patient oral rehydration solution for 4 or 6 hours?

Trainer: After treatment, pinch the skin again:

- If the patient still has severe dehydration, send them to hospital for intravenous fluids. Give 5 ml of oral rehydration solution each minute on the way to hospital.
- If the patient still has some dehydration, continue to give oral rehydration solution for another 4 hours.

Student: How do we treat patients after 4 or 6 hours of treatment who do not have dehydration any more?

Trainer: We give these patients oral rehydration salts to make up a solution at home. Teach the patient or the patient's carer about home treatment of diarrhoea.

Home treatment Ask the students how to treat diarrhoea at home. Look for the following answers.

Answer Give the patient as much extra fluid as he will drink. Tell the carer that if the child vomits, this is usually only one-quarter of the fluid that they have drunk, so that most of the extra fluid is still inside him. If the child is breastfeeding, breastfeed them frequently and for longer than usual at each feed. Give clean water between breastfeeds. The patient's urine should become clear instead of dark and yellow.

Answer Feed the patient five times a day or more. Continue doing this until the patient is well again and for one extra week after they get well. This is especially important to prevent malnutrition if the patient is a young child.

Answer Tell the patient to return to the health centre if the patient:

- cannot drink or breastfeed
- becomes more ill
- develops a fever
- has blood in his faeces.

Continue the demonstration tutorial:

POSTER 5:
(Prepared poster)

Extra fluid for diarrhoea

Copy Table 2 onto Poster 5.

TABLE 2 Extra fluid for diarrhoea

Age	Amount of extra fluid to give each time a patient passes loose faeces
Up to 2 years	100 ml (1/2 cup)
2 years to 9 years	200ml (1 cup)
10 years and more	400 ml (2 cups)

Trainer:

Teach carers that children with diarrhoea need more fluid than they normally drink each day. Give extra fluid each time the patient passes loose faeces. Show the carer how much extra fluid to give. What extra fluid should she give if the patient was dehydrated when he arrived at the health centre?

Student:

At first we give oral rehydration solution as extra fluid between feeds.

Trainer:

Excellent. Each standard packet of oral rehydration salts will make 1 litre (1000 ml) of solution. Give two standard packets of oral rehydration salts to children less than 10 years old. Give four standard packets of oral rehydration salts to patients aged 10 or more. Show the carer how to make up the solution. Tell her that the solution or other extra fluids may make diarrhoea worse, but these fluids will prevent dehydration.

Use the instructions in Appendix 11 to teach students how to put in a nasogastric tube. Ask the students to read Appendix 12: How to treat diarrhoea.

Refreshment break.

Demonstration

What to teach village leaders

For this demonstration, the volunteer student will teach the class.

POSTER 6:
(Student answer poster)

How to prevent diarrhoea

Divide Poster 6 into four areas and write the four headings: '1. How to feed children', '2. Food hygiene', '3. Pit latrines' and '4. Treatment'. The volunteer student will use Poster 6 during this demonstration.

Tell your students:

Imagine you are going to talk to the leaders in your village about preventing diarrhoea. Village leaders are important people. It may be difficult to tell them what to do. Let the village leaders tell you how to prevent people getting ill with diarrhoea. Now ask the volunteer student to teach the class. She will play the role of the teacher. The other students will play village leaders.

The student teacher says to the village leaders:

Many of us know some of the ways to prevent our children from getting ill or dying with diarrhoea. It is important that we all know *all* the ways to prevent diarrhoea. I would like you to tell me your ideas.

Think about your ideas in each of these four areas. I will write your ideas on Poster 6 under the four areas as you call them out. Ask the student teacher to put up Poster 6.

The student teacher should encourage the village leaders to say the correct answers below. She should also summarise any other useful things that the village leaders say under the correct areas on Poster 6.

Area 1: How to feed children

1. **Breastfeed** children **until** they reach **2 years of age**.
2. **Never use a bottle** to feed children. Bottles are very difficult to clean. The bacteria in bottles cause diarrhoea. **Use a cup and a spoon** to give fluids.
3. Feed children **less than 6 months** with breastmilk only.
4. After 6 months of age, give children other soft foods in addition to breastmilk. **After 9 months of age** give a **mixed diet** at least **four times a day** in addition to breastmilk.

Area 2: Food hygiene

1. Drinking water should be from a **protected water source**. Tap water is normally safe. Water from a well is normally safe if the well has been built correctly. Boil water from any other source for 20 minutes to make it safe to drink.
2. **Wash fruit and vegetables** before eating.
3. **Wash** your **hands** before preparing or eating food.
4. Cover food, faeces and rubbish to keep flies away.

Area 3: Pit latrines

1. Go to the toilet or put **all faeces in a latrine**. If there is no latrine, use a small hole away from the house. Cover faeces with some soil every day.
2. **Wash** your **hands** after passing faeces. Wash young children after they have passed faeces.
3. If a **child** passes **faeces** near the house put the faeces **in the latrine** or hole.

Area 4: Treatment for diarrhoea

1. Drink plenty of fluids. Any type of fluid (except alcohol) will help. Sugar and salt solution or coconut water with a pinch of salt are better than normal drinks. Give **as much fluid** as the person **will take** between feeds.
2. **Feed at least five times a day**.
3. **Bring** the patient **to** the **health centre if**:
 - they are **not able to drink** or breastfeed
 - they become **more unwell**
 - they develop a **fever**
 - there is **blood in their faeces**.

Ask students to copy Poster 6 when it is finished.

Polio

Good food hygiene and using pit latrines will also prevent polio.

If polio is a problem in your area, teach Appendix 13 'Polio'.

SECTION 3: When to refer patients to hospital

You should send a patient to hospital if:

1. She has a general danger sign.
2. After 4-6 hours of treatment, the skin still takes more than 2 seconds to become flat again.
3. She has passed very watery faeces six times or more this morning. (Send to a cholera treatment centre.)
4. She is not improving after treatment for Giardia within 2 weeks. (Arrange an HIV test if this has not been done recently.)
5. She has peritonitis. (Send to a hospital that can do operations.)

SECTION 4: Practical

Tell the students that we will do three role plays to help them diagnose and treat patients with diarrhoea. Divide the class into six groups of at least three students. Each group does each of the three role plays. In each role play, one student will play the doctor, one student will play the patient or the patient's carer, and a third student will be the observer.

Tell your students:

- Give the patient (or the patient's carer) a piece of paper.

This piece of paper tells the patient what symptoms he has. If the doctor asks the correct questions, the patient will tell the doctor about his symptoms.

- Give the doctor a piece of paper.

This piece of paper tells the doctor what she will find when she examines the patient. The doctor's job is to ask the four important questions for diarrhoea. The doctor must make sure that the patient does not have a general danger sign. The doctor decides what treatment to give the patient.

- Give the observer a piece of paper.

This piece of paper tells the observer: (1) the diagnosis, (2) the treatment, (3) advice for the patient, and (4) whether the patient should be sent to hospital. After each role play, the observer should tell the group what the doctor did correctly and what he could have done better.

Role plays

- Tell the groups that they have 40 minutes to do all three role plays. Different students should play each role in each role play.
- Give each group the three role plays and help the students to use Appendix 10. Below is the information for the role plays.

ROLE PLAY 1:

You are the **carer** of the patient, a 6-month-old child. The child has a fever and he has had diarrhoea for 2 days. He passed faeces two times this morning. He does not have blood in his faeces. He vomited one time today. He has not had a convulsion. He passed clear urine two times this morning.

You are the **doctor**. You find that the patient's mouth is not dry. A pinch of skin over his hip bone goes back quickly. The child is breastfeeding. His growth chart shows that he weighs 6.5 kg. The growth line is flat but it went up last month.

You are the **observer**. The child has gastroenteritis and possible malaria. Do a test for malaria. Teach the carer home treatment for diarrhoea.

ROLE PLAY 2:

You are the **carer** of a patient, an 18-month-old child. The child does not have a fever. He has had diarrhoea for 4 days. He has passed very watery faeces four times this morning. He does not have blood in his faeces. He has vomited one time today. He has not passed urine this morning. He breastfeeds slowly.

You are the **doctor**. You find that the patient's mouth is dry. A pinch of skin over his hip bone takes more than 2 seconds to go flat. He is not anaemic and has no fever. His growth chart shows that he now weighs 8.5 kg and he weighed 9 kg one month ago.

You are the **observer**. The child has gastroenteritis and severe dehydration. Put in a nasogastric tube. Give oral rehydration solution in small amounts. Give 170 ml (20 ml x 8.5 kg) of this solution every hour for 6 hours. This is a total of 1020 ml (170 x 6). Next, pinch his skin again. If the skin goes back quickly, give home treatment if the child is able to drink. If the skin still takes less than 2 seconds to become flat again, continue to give oral rehydration solution in small amounts. Give him 170 ml of solution every hour for 4 hours. This is a total of 680 ml (170 x 4).

ROLE PLAY 3:

You are the **carer** of a 5-year-old child. The child has a fever. He has had diarrhoea for 2 days. He passed loose faeces three times this morning. He does not have blood in his faeces. He has vomited four times today. He is not able to breastfeed. He has not had a convulsion.

You are the **doctor**. You find that the patient's mouth is dry. A pinch of skin over his hip bone takes less than 2 seconds to go flat. The child has no interest in anything. He is not anaemic. His growth chart shows that he weighs 13 kg.

You are the **observer**. The child has a general danger sign and a very severe febrile disease. Clear his mouth. Lay him on his side. Treat fever with tepid sponging. Do a malaria test. If the malaria test is positive give him an intramuscular injection of artesunate. Give him an intramuscular injection of ceftriaxone, benzylpenicillin or procaine penicillin fortified. Send him to hospital. On the way to the hospital: give oral rehydration solution, 5 ml each minute through a nasogastric tube.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. When should you use antibiotics to treat patients who have diarrhoea?
 - Treat all children with dysentery with co-trimoxazole.
 - Treat all patients who have both malnutrition and dysentery with co-trimoxazole.
 - Treat very ill adults with co-trimoxazole if they have dysentery.
 - Treat adults who are no better 5 days after the dysentery started with co-trimoxazole.
 - Antibiotics are also used to treat cholera.
 - Metronidazole is used to treat suspected giardia (if diarrhoea has gone on for 2 weeks or more).

2. What are the causes of diarrhoea?
 - Gastroenteritis. Gastroenteritis is caused by bad hygiene.
Good hygiene means:
 - wash hands before preparing or eating food
 - use a pit latrine when passing faeces
 - drink water from a protected water source
 - breastfeed. never bottle-feed children
 - wash fruit and vegetables
 - Food poisoning
 - Malnutrition
 - Any illness which causes a fever
 - malaria
 - tonsillitis
 - measles
 - otitis media
 - Severe illnesses that may cause peritonitis
 - appendicitis
 - intussusception

3. How can you tell if a patient is dehydrated?
 - The patient's mouth is dry.
 - Pinch a fold of his skin, over a bone, and let it go. The skin goes back slowly.
 - If the patient is dehydrated, the urine will be dark yellow and he will have passed urine only one time or no times this morning.

4. When should patients with diarrhoea be sent to hospital?
 - Patients with a general danger sign.
 - If, after treating a patient for 4-6 hours, the skin takes more than 2 seconds to become flat again.
 - The patient has passed very watery faeces six times or more this morning. (Send to a cholera treatment centre.)
 - If a patient is no better 2 weeks after treatment for giardia.
 - If a patient has peritonitis. (Send to a hospital that can do operations.)

Lesson 7 **Women's health problems**

BEFORE THE LESSON

- There are two posters in this lesson. (See p. 4 for information on how to use the posters.)
- Prepared posters: 1, 2
- Make a copy for each student of Appendixes 14 and 15.
- There are nine demonstrations in section 2. Ask nine students to help you. Prepare two copies of each role play. Give one copy to a student. The other copy is for you (or use this book). Practise before the lesson.
- Decide if you need to teach students how to measure haemoglobin (this is not covered in this manual).
- Prepare two examples of obstetric problems which you will present to students in section 3. Use Appendix 15.
- Prepare three large signs for the practical in section 4. Prepare one page of paper with a symptom written on it for each student. You need sticky tape.
- Some areas do not have sexually transmissible disease clinics or gynaecology clinics. Your country should decide how these areas should manage these symptoms and presentations.

Lesson plan

1 Quiz

2 Diagnosis and management

3 When to send patients to hospital

4 Practical

5 Answers to the quiz

SECTION 1: Quiz

POSTER 1:

(Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. Which medicines are safe to give to a pregnant woman?
2. Which medicines are not safe to give to a woman who is breastfeeding?
3. How do you treat a pregnant woman who is having a convulsion?
4. How do you treat anaemia in the last month of pregnancy?

SECTION 2: Diagnosis and management

Discussion

In some countries, it may be difficult for a male health worker to treat a woman patient who has gynaecological problems (problems with her private parts). Divide the students into three groups. Ask the groups to discuss how this difficulty can be solved in your country. Next, ask each group to present their ideas.

Gynaecology problems

Women who are not pregnant may have problems with their private parts. These are called gynaecology problems. Pain in the lower abdomen or an unusual discharge from the vagina are usually gynaecology problems. Take a history. You then need to ask women with these problems five questions (see Poster 2).

POSTER 2:

(Prepared poster)

Questions for women with gynaecology problems

1. For how many days do you bleed each month? Does blood make your pad or cloth very wet in less than one hour?
2. Do you have bad pain every month when your period comes?
3. Is it painful when you have sexual intercourse? Do you pass blood after sexual intercourse when you do not have a period?
4. Do you have an unusual or smelly discharge from your vagina?
5. Was your last normal period more than 6 weeks ago?

Tell the students that we will now discuss the answers to these questions and what treatment to give. Give each student a copy of Appendix 14.

1. If a woman bleeds for more than 8 days every month or if a pad or cloth becomes very wet in less than one hour, she has **heavy periods**. Heavy periods may cause anaemia. Check for anaemia and treat if present.

Treatment:

- If the woman plans to get pregnant, give her ibuprofen 400 mg three times a day (after food) *only* on the days that she has pain or bleeding. (If ibuprofen is not effective, try tranexamic acid 1 gram (500mg x 2 tablets) three times a day for 4 days from the onset of the period.)
- If the woman does not plan to get pregnant, send her to the Maternal and Child Health or family planning clinic. The clinic may give her the combined oral contraceptive pill. This will also work for heavy prolonged vaginal bleeding that can be caused by a hormone imbalance. But check that she does not have pain during intercourse, since heavy or prolonged periods can be caused by pelvic inflammatory disease. Consider doing a vaginal examination to check for tenderness of the cervix. Taking the pill will stop her from bleeding heavily. For most women it is safe to take the combined oral contraceptive pill for many years. Women should not usually take the pill if they are older than 45 years or if they smoke and are older than 40 years.

2. **Pain every month** that stops her from working.

Treatment:

- If the woman plans to get pregnant, give her ibuprofen 400 mg three times a day (after food) *only* on the days that she has pain or bleeding. (If ibuprofen is not effective, try mefenamic acid 500 mg three times a day for 4 days from the earliest sign of a period starting.)
- If the woman does not plan to get pregnant, send her to the Maternal and Child Health or family planning clinic. The combined oral contraceptive pill will reduce period pain.

3. **Pain or blood during sexual intercourse.**

Treatment:

- If the woman is less than 45 years old, she may have a sexually transmitted disease (such as pelvic inflammatory disease or cervical cancer). Send her, and her partner, to the sexually transmitted disease clinic.

LESSON 7 Women's health problems

- If she is more than 45 years old, send her to the gynaecology clinic. She may have cervical cancer or a sexually transmitted infection.

4. Unusual or smelly **discharge from her vagina.**

Treatment:

- If the woman is less than 45 years old, she may have a sexually transmitted disease. Send her and her partner to the sexually transmitted disease clinic.
- If she is more than 45 years old, send her to the gynaecology clinic.

Obstetric problems

Obstetrics is to do with the problems of women who are pregnant. It is possible that a girl or women between the ages of 12 and about 50 could be pregnant. Even if you ask her privately and sensitively about the possibility of pregnancy, many women are embarrassed to admit this.

Demonstrations Give each student a copy of Appendix 15. You will do the following eleven demonstrations with different students. The demonstrations show different obstetric problems. There are also 2 discussions about miscarriage/ abortion and unsafe termination of pregnancy. (Also see page 27 in the Lesson about sexual and adolescent health.)

Appendix 15 summarises the main diagnostic and treatment points of these demonstrations. Students will learn how to use Appendix 15 in section 3 of the lesson.

DEMONSTRATION 1: Vomiting in early pregnancy

Student: *An 18-year-old woman comes to see you. Her last period was 6 weeks ago. She has vomited two times each day for the past 2 weeks. She does not have any pain when she passes urine. She passes urine more often than usual. Can you help her?*

Trainer: This woman may be pregnant. Vomiting in early pregnancy is a very common problem. If a woman vomits severely in pregnancy we must look for a urinary tract infection. Send her to have her urine examined. If she has a urinary tract infection, give her amoxicillin 500 mg three times a day for 5 days.

Student: *Are there any other problems that cause severe vomiting in pregnancy?*

Trainer: Twin pregnancy may cause severe vomiting.

Student: *If the woman does not have a urinary tract infection, what treatment can we give her?*

Trainer: Offer medication for nausea. Try to give it either by mouth or into a muscle. Examples are cyclizine, prochlorperazine and promethazine. Send her to hospital if she is still vomiting severely. Advise her to eat small amounts of food and drink every hour. For example ginger biscuits can help. Suggest that she eats a ginger biscuit when she wakes. Tell the woman that this problem will usually disappear before 14 weeks after the start of her last period. Do not give her Ondansetron in the first 12 weeks of pregnancy. Ondansetron can damage the unborn baby.

DEMONSTRATION 2: Ectopic pregnancy *Always think about the possibility of an ectopic pregnancy in the first 3 months of pregnancy*

Student: *A 19-year-old woman has had dizziness and severe pain in her lower abdomen for 6 hours. What questions would you ask her? How would you treat her?*

Trainer: Was your last normal period more than 6 weeks ago? If she says yes, she may be pregnant. If she has severe pain in her lower abdomen, she may have an ectopic pregnancy. Send her immediately to a hospital that can do operations. Give her oral rehydration solution, one teaspoonful every minute.

An ectopic pregnancy means that the unborn baby is not inside the uterus. This is very dangerous because ectopic pregnancy may cause bleeding inside the abdomen, peritonitis and shock. A woman with shock may feel dizzy, anxious and sweaty. She may lose consciousness. An operation may save the woman's life.

Slight vaginal blood loss, or dark brown discharge, with pain in the lower abdomen, especially if the pain is one-sided, must be considered to be due to an ectopic pregnancy until proven otherwise. She may feel faint and dizzy and may feel pain at the tip of the shoulder.

DEMONSTRATION 3: Antepartum haemorrhage (APH)

Student: *A woman who is 7 months pregnant has passed a small amount of blood from her vagina. She does not have pain in her abdomen. She does not have a fever. What would you do for her?*

Trainer: This woman has had an antepartum (before birth) haemorrhage. You must not do a vaginal examination since this may make the bleeding much worse. Send her to hospital immediately.

Student: *What would you do if the woman started to bleed heavily?*

Trainer: Give her oral rehydration solution to drink. She should drink one teaspoonful every minute on her way to hospital.

Student: *Another woman who is less than 6 months pregnant passes blood from her vagina. What would you do?*

Trainer: This is either a threatened abortion or an abortion. An abortion is when the unborn baby dies.

- If the woman has a fever, give her an intramuscular injection of 2 million IU of benzylpenicillin. Next, send her to hospital.
- If the woman passes more than a small amount of blood, send her to hospital.
- If the woman does not have a fever and only passes a small amount of blood, tell her to rest at home. She should not do any heavy work or have sexual intercourse for 2 weeks.

DEMONSTRATION 4: Anaemia in pregnancy

(You may want to teach students how to measure haemoglobin. This is not covered in this manual.)

Student: *A woman who is in the last month of her pregnancy feels weak and tired. She is pale. How would you treat her?*

Trainer: Measure the woman's haemoglobin (Hb) in the health centre or hospital. Examine the woman's faeces for hookworm eggs if possible.

1. If her haemoglobin is less than 7 g/dl test her for malaria in malaria areas. Next, send her to hospital for a blood transfusion.
2. If her haemoglobin is between 7g/dl and 10g/dl:
 - Test for malaria in malaria areas. Fansidar is used in many countries to prevent malaria in the 2nd and 3rd trimesters.
 - Give her mebendazole if there are many hookworm eggs in the faeces. Do not give mebendazole in the first 3 months of pregnancy.
 - Give her ferrous sulphate 200 mg (with or without folic acid 0.25 mg) three times a day for at least 3 months.

Student: *Is it possible to stop pregnant women from becoming anaemic?*

Trainer: Every pregnancy will result in a mild degree of anaemia. But you can prevent severe anaemia. Teach women to eat a mixed diet, that includes foods that contain iron, folic acid and vitamin C. Advise women to wear shoes.

Anaemia from any cause will weaken the mother. Post-partum haemorrhage (PPH) can kill and is the commonest cause of maternal death in Low and Middle Income countries. This is more likely if the mother is already anaemic. For this reason give pregnant women 200 mg ferrous sulphate (or one tablet of ferrous sulphate 200 mg with folic acid 0.25 mg) every day for the whole of the pregnancy in areas where iron deficiency is common.

If pregnancy is planned the woman should also ideally be on folic acid 0.4 mg daily for 3 months before conception. This is continued until the woman is 13 weeks pregnant. If the pregnancy is unplanned, folic acid should be commenced as soon as pregnancy is suspected. This can be very effective in preventing spina bifida (a condition in the unborn baby when the spine does not form correctly).

DEMONSTRATION 5: *Pre-eclampsia and eclampsia*

Student: *A woman who is 8 months pregnant has a headache. She does not have a fever. Her diastolic blood pressure is 100 mmHg. She may have pre-eclampsia. What should you do for her?*

Trainer: Send any pregnant woman with a diastolic blood pressure of 100 mmHg or more to hospital immediately. If a pregnant woman's blood pressure goes very high she may have a convulsion. This is called eclampsia. Eclampsia may kill her and her unborn baby.

Student: *What causes pre-eclampsia and eclampsia?*

Trainer: The cause is not known. Pre-eclampsia and eclampsia damage the kidneys, the blood vessels and the brain. The kidney damage causes women to pass protein in their urine. The blood vessel damage causes women to have high blood pressure. The brain damage causes convulsions and death.

Student: *How can we stop eclampsia from killing women?*

Trainer: The Maternal and Child Health worker should measure a pregnant woman's blood pressure every second week in the last 3 months of pregnancy.

- If the woman's diastolic blood pressure is 90 mmHg or more, examine the blood pressure again after one week.
- If the blood pressure is 95 mmHg or more, send the woman to hospital this week.

LESSON 7 Women's health problems

- If the blood pressure is 100 mmHg or more, send the woman to hospital today.

Student: *What should we do if a pregnant woman has a convulsion?*

Trainer: • Give her 10 mg diazepam rectally.

- Next, put her onto her side so that if she vomits she will not breathe in vomit.

- Give her magnesium sulphate 5 g intramuscularly into each leg.

- Send her to a hospital where operations are done.

- If she is still having a convulsion after 5 minutes, give her 10 mg diazepam rectally again.

- Give a further 5 g of magnesium sulphate after 4 hours, 2.5 g into each leg.

DEMONSTRATION 6: *Prolapsed cord*

Student: *A woman who is in the last month of her pregnancy tells you that a large amount of water passed from her vagina today. The baby's umbilical cord is hanging out of the woman's vagina. What will you do?*

Trainer: What you do depends on whether the cord has a pulse:

- If the umbilical cord does not have a pulse, the baby is already dead. The woman may be able to give birth to the dead baby at home. If the baby has not been born after 12 hours send her to hospital.

- If the umbilical cord has a pulse and the cervix is fully open (10 cm wide), allow the baby to be born immediately.

- If the umbilical cord has a pulse and the cervix is not fully open, ask the woman to kneel down and to bend forward. Her bottom should be higher than her head. Gently put the umbilical cord back into the woman's vagina. Gently push the baby away from the cord. Next, send the woman to a hospital where operations are done immediately. The woman will have to be carried very carefully.

Refreshment break

DEMONSTRATION 7: *Ruptured uterus*

Student: *A 30-year-old woman who has already had seven children has been in labour for 24 hours. She had severe, constant pain in her abdomen. The woman lost consciousness 10 minutes ago.*

Trainer: The woman's uterus may have ruptured. You may be able to feel parts of the baby's body very easily in the woman's abdomen. Her pulse will be fast and weak. Her blood pressure will be low. The woman may pass blood from her vagina.

Student: *What would you do for her?*

Trainer: Send her immediately to a hospital where operations are done. There is a high chance that she will die. If possible, give her intravenous fluids. (If the woman is conscious, give her oral rehydration solution to drink, 5 ml every minute.)

Student: *How can we prevent the uterus from rupturing?*

Trainer: If a woman has had a previous caesarean section or an operation to remove fibroids (a myomectomy) the scar can rupture in labour. It should be planned that these women are delivered in a hospital, where there is

the facility for emergency caesarean section.

Also send women to hospital (for possible caesarian section):

- If a woman's labour pain has been happening regularly for more than one day and one night.
- If a woman has been pushing for more than 2 hours with no progress.

DEMONSTRATION 8: *Postpartum haemorrhage (PPH)*

Student: *A 35-year-old woman gave birth to her seventh child half an hour ago. The woman has a large amount of blood coming from her vagina. She feels dizzy.*

Trainer: This is called postpartum haemorrhage. The bleeding may be very fast, or slower and last too long. PPH is the major cause of maternal death in low and middle income countries.

- Shout for help.
- Tell the woman to pass urine immediately, where she is. (It is likely that you will need to put a catheter into her bladder to empty her bladder if she can't pass urine.)
- Tell her to breastfeed the child immediately. If the child is dead, ask her to squeeze her nipples between her fingers.
- Give her an injection of 0.5 mg ergometrine into a vein, or intramuscularly.
- Rub the uterus firmly (this will hurt) in a circular movement until the uterus feels hard and stays hard. Put the catheter in the bladder now if needed.
- Give her oral rehydration solution to drink, 5 ml every minute. Intravenous fluids are better if available. For example 2 litres of normal saline.
- If the placenta does not come out, send the woman to a hospital where operations are done.

Show the students what you mean in the next point, pretending to put your hands on the woman's uterus. Ask them also to copy your actions.

- If the bleeding has not stopped: feel the uterus in the abdomen. If the uterus is soft, put your right hand into her vagina and squeeze the uterus with your left hand. If the uterus stays soft: continue to squeeze until the woman sees a women's doctor. If the uterus is hard, put a clean cloth into her vagina to stop blood from coming out. If you have an ESM-UBT kit, use it. Follow this link to learn how an ESM-UBT is used: <https://www.bbc.co.uk/ideas/videos/how-to-save-a-young-mothers-life-with-a-condom/p05b5b8t>
- Take the woman immediately to a hospital where operations are done.
- If the bleeding does not stop, aortic compression will accomplish this. Make a fist with one hand. Place the fist at the level of the umbilicus (mid abdomen) and press down very very firmly to compress the aorta against the mother's back. This will be very uncomfortable but can be life-saving. If required it can also be continued while transporting the patient.

Student: *If a woman starts to bleed heavily from her vagina more than 24 hours after the baby was born, what would you do?*

Trainer: Send the woman to hospital.

DEMONSTRATION 9: Medicines for pregnant women and women who are breastfeeding

Student: *A 25-year-old woman who is two and a half months pregnant was treated with the first-line malaria treatment less than 2 weeks ago. She has a fever. A blood film shows that she has malaria. (You can not use a Rapid Diagnostic Test within 3 weeks of treatment for malaria.) What treatment can you now safely use?*

Trainer: Coartem. Coartem can now used in the first 3 months of pregnancy. Artesunate, given into a vein or muscle, should be used for severe malaria. Fansidar is also used in many countries to prevent malaria in the 2nd and 3rd trimesters.

Student: *What other medicines are safe to use for pregnant women?*

Trainer: Paracetamol, phenoxymethylpenicillin, benzylpenicillin, amoxicillin, ampicillin, ferrous sulphate, folic acid, Fansidar, oral rehydration salts solution, and most medicines which are put on the skin.

Student: *What medicines are not safe to give to women who are breastfeeding or pregnant?*

Trainer: Chloramphenicol and the combined oral contraceptive pill. Enalapril and most medications for high blood pressure should not be used during pregnancy, or whilst planning for pregnancy.

DEMONSTRATION 10: Spontaneous Rupture of Membranes (SROM)

Student: *A 25-year-old woman who is 37 weeks pregnant says that her waters have broken but she is not experiencing any contractions. What should we do?*

Trainer: When the 'waters break' around a pregnancy, the mother will usually already be in labour.

Sometimes when a woman is at term, the first sign of labour is a sudden drainage of water (amniotic fluid) from the vagina. You can confirm by speculum examination that this fluid is draining through the cervix (neck of the uterus) and is therefore not urine. When the membranes around the baby break before contractions begin, it can mean that the baby is lying in a difficult position. Rather than get into difficulties, it is best to transfer the mother at this early stage to hospital.

DEMONSTRATION 11: Preterm Pre-labour Rupture of Membranes (PPROM)

Student: *A 25-year-old woman who is 33 weeks pregnant has fluid leaking from her vagina. What should we do?*

Trainer: Occasionally the membranes break prematurely, several weeks before a baby is due. A sterile speculum examination is permissible in order to confirm that amniotic fluid is draining through the cervix. However, it is important that you **do not** carry out a digital vaginal examination, because of the risk of introducing infection. Transfer women who are less than 37 weeks pregnant to a health facility unless delivery is imminent. Every pregnancy between 24 -34 weeks with ruptured membranes should be transferred promptly to an obstetric facility to receive corticosteroids to boost the baby's lung maturity. This will increase its chance of survival.

Some women can have amniotic fluid discharging for several weeks without risk to the baby. Bed rest is very beneficial. All cases of premature labour (less than 37 weeks) should be transferred promptly to hospital if possible.

DISCUSSION 1: What is meant by the words miscarriage, abortion and termination?

- Miscarriage may occur very early in a pregnancy. Usually after a woman has missed only one or two periods. Occasionally it can be much later.
- Miscarriage is where the pregnancy fails and the baby dies in the first 23 weeks of pregnancy.
- Miscarriage and abortion really mean the same thing, but many people call it an abortion if the pregnancy has been deliberately terminated. It is better to use the word *termination* for this.
- A pregnancy test may still be positive for some time after a miscarriage.
- If there is only slight vaginal bleeding without pain this should be regarded as a threat to miscarry. The woman should be advised to rest at home until there has been no bleeding for 48 hours. She should have no sex at this time. If the bleeding becomes heavy; and /or pains develop and then increase in severity; it is very likely that the miscarriage is becoming inevitable and she will miscarry. (The pain can be described as being worse than labour. This may be because the distress of losing a baby makes the pain feel worse. (A speculum examination would show that the cervix is now open.)
- Sometimes the pregnancy sac containing the dead baby passes from the vagina. There may be no sign of the placenta. If the placenta is retained the woman may have bleeding later. Infection is more likely and that can affect future fertility.
- Refer her to hospital for evacuation of the retained products of conception if you think that she may have miscarried but incompletely. Send whatever tissue has been passed with her when she is transferred if possible.

DISCUSSION 2: What is an unsafe abortion or termination?

- If you see a pregnant patient at any stage of the miscarriage ask sensitively about the possibility that she may have had an unsafe abortion.
- Consider this especially if the woman is very young; very unwell; has a fever; has heavy bleeding; has severe pain.
- There is a high risk of infection and sepsis. It is important to be not to judge her since she is likely to be very stressed.
- Abortion can be fatal. Never hesitate to refer an unwell patient immediately to hospital.

SECTION 3: When to refer patients to hospital

Teach student how to use Appendix 15. Give the students two examples of obstetric problems and show them how to use the appendix for diagnosis and treatment.

SECTION 4: Practical

This activity will help you to learn the symptoms of sexually transmitted diseases and urinary tract infections.

Give each student a piece of paper with a number and one of the following nine symptoms written on it. For example, if you have 27 students, you need three pieces of paper with each symptom.

1. Unusual discharge from the vagina.

LESSON 7 Women's health problems

2. Pain when having sexual intercourse.
3. Ulcers near the vagina.
4. Pain on passing urine.
3. Passes urine more often than usual.
4. Pain in the lower abdomen.
5. Fever.
6. The woman's partner has pain when he passes urine.
7. The woman's partner has a discharge from his urethra (private parts).

Activity Ask each student to stick the paper on their chest. Put a large sign 'Sexually transmitted disease' on one wall. On the opposite wall, put a sign 'Urinary tract infection'. On a wall between these two walls, put a sign 'Sexually transmitted disease or Urinary tract infection'.

Explain that the symptom each student has written on the paper on their chest may be caused by either a sexually transmitted disease, or by a urinary tract infection or by both.

Tell the students:

- If you think that your symptom can *only* be caused by a sexually transmitted disease, stand by that sign.

Answer Students with numbers 1, 2, 3, 8 and 9 should stand next to the 'Sexually transmitted disease' sign.

- If you think that your symptom can only be caused by a urinary tract infection, stand by that sign.

Answer No students stand next to the 'Urinary tract infection' sign.

- If you think that your symptom can be caused by *either* a sexually transmitted disease or a urinary tract infection, stand by the third sign.

Answer Students with numbers 4, 5, 6 and 7 stand next to the 'Sexually transmitted disease or Urinary tract infection' sign.

Treatment:

- If a patient has symptom 1, 2, 3, 8 or 9 (say the symptoms) send her (and her partner) to the sexually transmitted disease clinic.
- If a patient has symptom 4 or 5 (say the symptoms), send her to have her urine examined. She may have a urinary tract infection.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. Which medicines are safe to give to a pregnant woman?

Quinine, paracetamol, aluminium hydroxide, phenoxymethylpenicillin, benzylpenicillin, amoxicillin, ampicillin, ferrous sulphate, folic acid, oral rehydration salts solution and most medicines which are put on the skin. Coartem is safe in pregnancy. Fansidar is taken to prevent malaria in the 2nd and 3rd trimesters.

2. Which medicines are not safe to give to women who are breastfeeding?

Chloramphenicol

3. How do you treat a pregnant woman who is having a convulsion?

- Give her diazepam 10mg rectally.
- Next, put her onto her side.
- Give her magnesium sulphate 5 g intramuscularly into each leg.
- Send her to a hospital where operations are done.
- If she is still having a convulsion after 5 minutes, give her diazepam 10 mg rectally again.
- Give a further 5 g of magnesium sulphate after 4 hours, 2.5 g into each leg.

4. How do you treat anaemia in the last month of pregnancy?

Measure the woman's haemoglobin. Check to see if she has a fever. Look for hookworm in the woman's faeces.

- If her haemoglobin is less than 7 g/dl, test for malaria (if there is malaria in the area), and send her to hospital to consider a blood transfusion.
- If there are a large number of hookworm eggs in the faeces, give mebendazole
- If her haemoglobin is 7 g/dl or more and below 10 g/dl give her ferrous sulphate 200 mg three times a day for at least 3 months.

Lesson 8 **Abdominal problems**

BEFORE THE LESSON

- There are nine posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared posters: 1, 4, 6, 9
Student answer posters: 2, 3, 7, 8
Summary poster: 5
- For Sections 2 and 3, you need a long sock and two balls of different sizes. Cut the end off the sock.
- You need a table or a bed at the front of the class for the demonstration 'How to examine the abdomen' in Section 2. Ask a male student to help you with the demonstration and practise before the lesson.
- Ask a male student to volunteer to allow you to draw the numbers of a clock on his abdomen.
- Prepare a copy of Pictures 15 and 16 for each student.
- Prepare a blank copy of Table 3, 'Features of abdominal problems', for each student.
- Copy the headings only and leave the boxes empty.
- If diabetes is a problem in your area, make a copy of Appendix 16 for each student.
- If your students can do urine microscopy in their health centres, make a copy of Appendix 17 for each student.
- Make a copy of Appendix 18 for each student.
- Prepare two examples of abdominal problems which you will present in section 3. Use Appendix 18.
- For Section 4, you need one copy of the questions for each group of five students.

Lesson plan

1 Quiz

2 Diagnosis and management of abdominal pain

3 When to send patients to hospital

4 Practical

5 Answers to the quiz

SECTION 1: Quiz

POSTER 1: *(Prepared poster)*

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. Name eight causes of peritonitis.
2. A woman has abdominal pain. What questions should you ask her?

SECTION 2: Diagnosis and management

Abdominal pain

Almost all abdominal problems cause abdominal pain. To diagnose the cause of abdominal pain, we need to know what type of pain each abdominal problem causes, and where each abdominal problem causes pain.

There are two main types of abdominal pain:

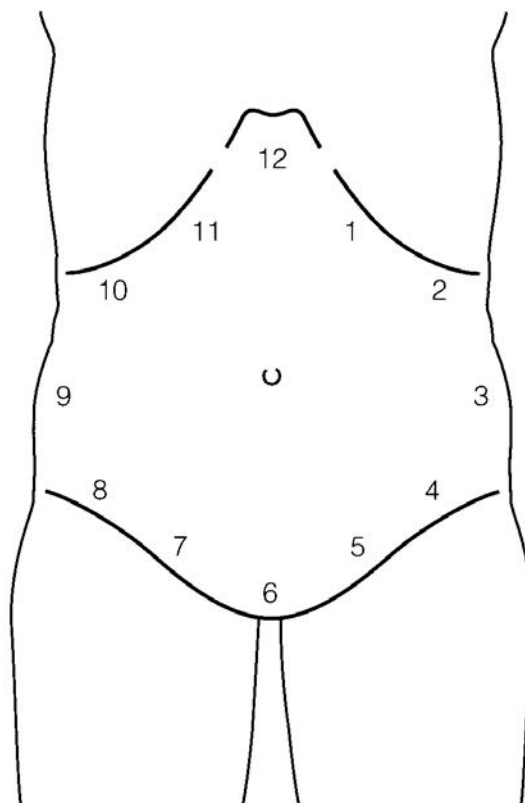
- intermittent abdominal pain
- constant abdominal pain.

Intermittent abdominal pain Abdominal pain is intermittent if it becomes bad for a short time (several seconds or a minute) and then gets better. The pain increases and decreases. Intermittent pain can continue for several hours or a few days. Patients with intermittent abdominal pain find it difficult to sit still. Intermittent pain may be caused by irritation or blockage of the bowel inside the abdomen. It may also be caused by problems in the ureters.

You now use the sock and the two balls to demonstrate how a blocked bowel can cause intermittent pain. Put the small ball inside the sock. Tell the students that this long sock is like the bowel. The bowel pushes food or faeces along. Normally food or faeces is soft and small and the bowel can easily push it. This small ball is like a small piece of food or faeces inside the bowel. Press on the ball and show the students how easy it is to push the ball from one end of the sock to the other. Explain that in the same way, it is easy for the bowel to push soft, small food or faeces. This does not cause pain.

Put the large ball inside the sock. Tell the students that it is difficult for the bowel to push through faeces that are hard and large. The large ball is like a large piece of faeces inside the bowel. Press on the ball and show the students that it is very difficult to push the ball from one end of the sock to the other. The bowel tries to push intermittently and this causes intermittent pain.

Next, you will teach the students where different abdominal problems cause pain. Ask the male student who volunteered to have the numbers of the clock drawn on his abdomen to take off his shirt and to show the class where you have put each number (Picture 14).



PICTURE 14 *Areas of the abdomen*

POSTER 2:
(Student answer
poster)

Intermittent abdominal pain

Write the *headings and the left column only* of Table 1 on Poster 2. Ask the students where each abdominal problem causes pain.

TABLE 1 Intermittent abdominal pain

Abdominal problems that cause intermittent pain	Where the problem causes pain
Labour (the pains that push the baby out when a baby is born)	6 and in the lower back
Early appendicitis	In the centre
Intussusception	In the centre
Volvulus	In the centre or 6
Gastroenteritis and food poisoning	12, in the centre or 6
Constipation	4,5 or 6
Early incarcerated hernia	In the centre or 6
Kidney stones (Stones in a ureter)	3 or 9

Constant abdominal pain Other abdominal problems usually cause constant abdominal pain. Constant pain is pain that does not go away. Patients with constant abdominal pain usually stay still.

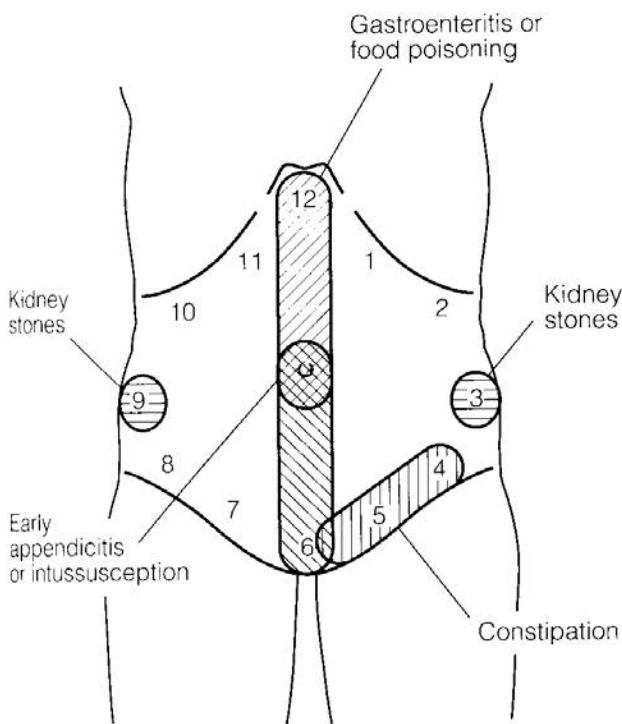
POSTER 3:
(Student answer
poster)

Constant abdominal pain

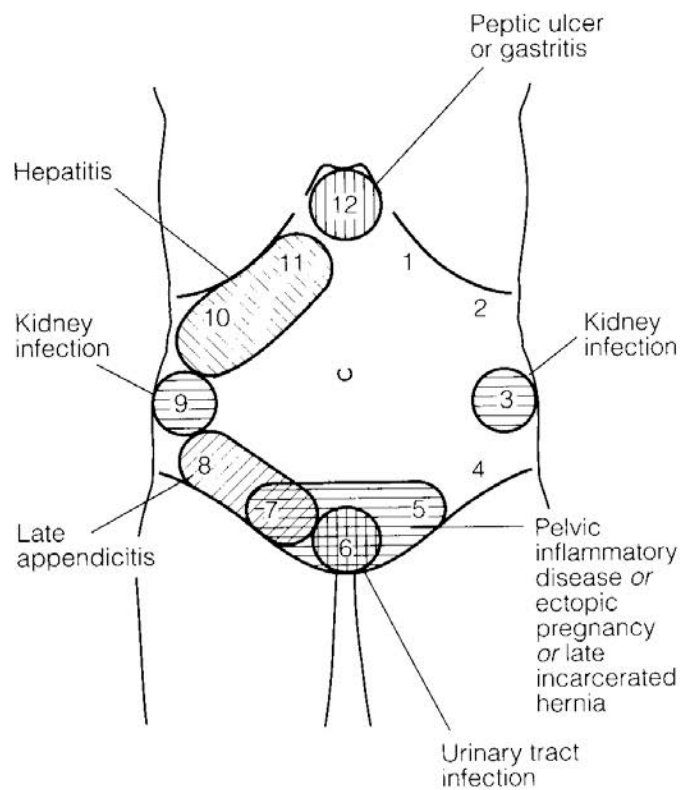
Write the *headings and the left column only* of Table 2 (p. 125) on Poster 3. Ask the students where each abdominal problem causes pain. Next, give each student a copy of Pictures 15 and 16.

TABLE 2 Constant abdominal pain

Abdominal problems that cause constant pain	Where the problem causes pain
Peritonitis	Any area, then all of the abdomen
Late appendicitis	7 and 8 then all of the abdomen
Urinary tract infection	6
Kidney infection (pyelonephritis)	3 or 9
Pelvic inflammatory disease (PID)	5, 6 or 7
Ectopic pregnancy	5, 6 or 7 then all of the abdomen
Peptic ulcer or gastritis	12
Late incarcerated hernia	5, 6 or 7 then all of the abdomen
Typhoid	Any area, then all of the abdomen
Hepatitis	10 or 11



PICTURE 15 Causes of intermittent abdominal pain



PICTURE 16 Causes of constant abdominal pain

How to take an abdominal history

POSTER 4:
(Prepared poster)

Questions to ask patients with abdominal pain or with blood in the faeces

1. Do you have any problems when you pass urine?
2. Are your bowels all right? In what way have your bowels changed?
3. If the patient is a woman, ask: When was your last normal menstrual period? Does your pain come at the same time as your period? Is it painful when you have sexual intercourse?
4. Show me where you feel the pain.
5. What type of pain do you feel? Is the pain constant or intermittent?
6. Is there anyone else at home who has the same symptoms that you have?

How to examine the abdomen

After taking a history, examine the abdomen of all patients who have severe abdominal pain or blood in the faeces.

Demonstration

Tell the students that you will show them how to do an examination. Put a bed or table at the front of the class. Ask the student with clock numbers drawn on his abdomen to walk towards you slowly. Tell him to hold his stomach and bend slightly forward as he walks. Ask him to slowly get onto the bed and lie on his back. Examine the volunteer with your right hand.

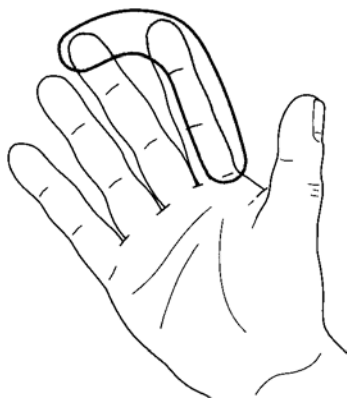
POSTER 5:
(Summary poster)

How to examine patients with severe abdominal pain

This patient bends forward when they walk, because they have severe abdominal pain. Do the following:

1. Look for **fever** and **anaemia**.
2. Next, ask the patient to look upwards. If the white part of his eye is yellow, the patient has **jaundice**. Only look for jaundice in sunlight.
3. Ask the patient to **lie flat** on his back with his arms by their side.
4. **Remove the clothes** from the **whole abdomen** (preserve their dignity). Remove clothes from the private parts of a man. (*Do not ask the student volunteer to do this in the class.*)
5. **Look for scars** of previous operations. Look for **swellings**.
6. **Ask the patient if** they have any **pain** at the moment. Ask him **where** the pain is.
7. **Watch** the patient's **face** when you touch their abdomen. The patient's face will show you if the patient is in pain.
8. **Use** the part of your **hand** that is best at feeling to do the examination. Start to examine the abdomen in the places where there is least pain.

Show the students, using your hand as an example, the area of the hand that is shown in the Picture 17.

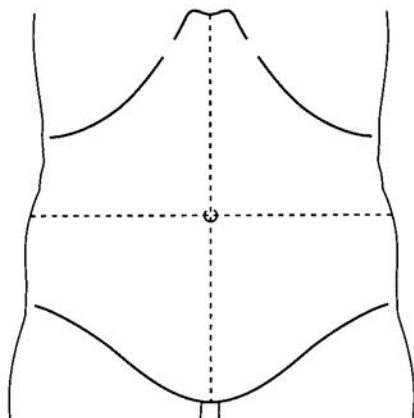


PICTURE 17 Area of the hand used to examine the abdomen

POSTER 6:
(Prepared poster)

Four areas of the abdomen

Draw Picture 18 on Poster 6



PICTURE 18 Four areas of the abdomen

(continued)

9. **Examine** each of the four areas of the **abdomen** (Picture 18). First, press lightly into each of the four areas. Next, press more deeply into each of these areas. Look to see if the pain becomes worse when you press. Feel for any unusual swelling.

10. If the pain becomes worse when you press into the abdomen, look for **guarding** and **rebound tenderness**:

- Press slowly and deeply into the abdomen. If the patient has guarding, the muscles will stop you from examining deeply. Guarding is when the muscles at the front of the abdomen become hard to protect the abdomen from more pain .
- Press slowly and deeply into the abdomen. Suddenly remove your hand. If the patient has rebound tenderness, the pain will suddenly become worse. Watch the patient's face.

11. Look for a **large spleen**. Start at area 7. Press your hand into the abdomen. Move your hand a little towards area 2. Press the abdomen again. Do this again and again. If the has a large spleen, you will feel the hard edge of the spleen before you feel the edge of the ribs.

12. Look for a **large liver**. Start at area 9. Press your hand into the abdomen. Move your hand a little towards area 10.

11. Press the abdomen again. Do this again and again. If the patient has a large liver you will feel the hard edge of the liver before you feel the edge of the ribs. The liver may also be tender if the patient has hepatitis.

13. Look for **painful kidneys**. Put your left hand behind area 3. Place your right hand on area 3. Press your right hand into the abdomen. If the patient has painful kidneys, the pain will increase when you press. Do the same at area 9.

Common and important abdominal problems

Show the students Poster 4 again.

POSTER 7:
(Student answer poster)

Common and important abdominal problems

Draw the *lines and headings only* of Table 3 (pages 129-130) on Poster 7. Give each of your students one *blank* copy of Table 3. Students should complete their blank Table 3 with the correct answers.

Labour

Labour pains (also called contractions) push the baby out when a woman is giving birth. A woman in labour will often have intermittent pain in the low back and the lower abdomen (area 6). Labour starts when the pains become regular. There are usually a few minutes between each pain.

Ask the students what to write in each space of the labour row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Peritonitis

Peritonitis is caused by damage or irritation to the inside of the abdomen. The inside of the abdomen is called the peritoneum. Peritonitis causes severe abdominal pain. Patients with peritonitis may vomit, but do not usually have diarrhoea. Patients with peritonitis often die. If a patient has guarding or rebound tenderness, they usually have peritonitis. Peritonitis is caused by:

- any illness which allows the bacteria or the acid in the bowel to enter the peritoneum
- any illness which causes a lot of blood to collect in the peritoneum.

Causes of peritonitis

Ask your students which eight illnesses commonly cause peritonitis.

POSTER 8:
(Student answer poster)

- **appendicitis**
- **perforated peptic ulcer**
- **intussusception**
- **incarcerated hernia**
- **ectopic pregnancy**
- **pelvic inflammatory disease** (a sexually transmitted disease)
- **typhoid**
- **volvulus**

Send all patients who have guarding, or rebound tenderness, immediately to a hospital that can operate. An operation may prevent death.

Appendicitis

Appendicitis is caused by unusual bacteria which damage the appendix. If the appendix is damaged, bacteria can enter the peritoneum and cause peritonitis.

Diagnosis: Appendicitis starts with an intermittent pain in the centre of the abdomen. After a few hours or days, the pain becomes constant in area 7 or 8 of the abdomen. The patient will have a slight fever. They will also have guarding and rebound tenderness, starting in areas 7 and 8. Later they will

LESSON 8 Abdominal problems

have guarding and rebound tenderness in all areas of the abdomen.

Treatment: Send all patients who may have appendicitis immediately to a hospital where operations are done.

Ask the students what to write in each space of the appendicitis row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

TABLE 3 Common and important abdominal problems

Problem	Question						
	Problems when pass urine?	Bowels alright?	Last period normal?	Pain		Anyone else?	May cause peritonitis?
				Where?	Constant or intermittent?		
Volvulus		No. Less often		Centre or 6 then all of the abdomen	Intermittent then constant		Yes
Gastroenteritis and food poisoning		No. Diarrhoea		12, centre and 6	Intermittent	Yes, often	
Constipation		No. Pain. Less often		4, 5 or 6	Intermittent		
Urinary tract infection	Yes. Pain. Passes urine often			6	Constant		
Kidney infection (pyelonephritis)	Yes. Pain. Passes urine often			3 or 9	Constant		
Kidney stones (stones in a ureter)				3 or 9	Intermittent		
Hepatitis				10 or 11	Constant		
Rectal prolapse		No. Something at anus			No pain in abdomen	Family and neighbours may also have whipworm	

TABLE 3 Common and important abdominal problems

Problem	Question						
				Pain			May cause peritonitis?
	Problems when pass urine?	Bowels alright?	Last period normal?	Where?	Constant or intermittent?	Anyone else?	
Labour				6 and the low back	Intermittent		
Appendicitis				Centre then 7 and 8	Intermittent then constant		Yes
Peptic ulcer or gastritis				12	Constant		Yes
Intussusception		No. Blood		Centre	Intermittent then constant		Yes
Incarcerated hernia		No. Less often		Centre or 6 then 5, 6 or 7	Intermittent then constant		Yes
Ectopic pregnancy			No. Last period missed or unusual	5, 6, or 7 then all of the abdomen	Constant		Yes
Pelvic inflammatory disease			Yes. Pain with sex	5, 6, or 7	Constant		Yes
Typhoid		Possibly: less often or more often.		If developed peritonitis any area, then all of the abdomen	Constant if has peritonitis	Sometimes	Yes

Peptic ulcer or gastritis

Peptic ulcers and gastritis are irritations of the inside of the upper parts of the bowel. Peptic ulcers and gastritis develop if the upper bowel is not able to protect itself from the acid in the stomach. Some medicines, especially ibuprofen, aspirin and prednisolone, and smoking can prevent the stomach from protecting itself. Sometimes a special bacteria called helicobacter pylori can cause ulcers or gastritis. A perforated gastric ulcer is caused when the acid makes a deep hole in the wall of the upper bowel. The acid may reach the outside of the bowel and cause peritonitis.

Diagnosis: The patient has constant pain in area 12 of the abdomen. The pain is made better by eating or drinking. Make the diagnosis from the history. You will not usually find anything when you examine the patient.

Treatment:

- Send all patients with peritonitis, or black tarry stool (altered blood) immediately to a hospital where operations are done.
- Or: If there is no guarding nor rebound tenderness, give the patient omeprazole. Give him 10 tablets. Tell the patient to take one a day until the pain has gone and for 3 extra days.
- Or: If pain in area 12 has been present for 2 weeks or more, or has lost weight, the patient may need other treatment for a peptic ulcer. Send the patient to hospital. They may be given eradication therapy for helicobacter pylori.

Tell all patients with a peptic ulcer or gastritis not to use aspirin or ibuprofen. Tell patients not to smoke. Tell patients who have pain in area 12 to eat small meals frequently. Antacids such as magnesium trisilicate may help.

Ask the students what to write in each space of the ulcer and gastritis row of the table. Fill in the correct answers on Poster 7.

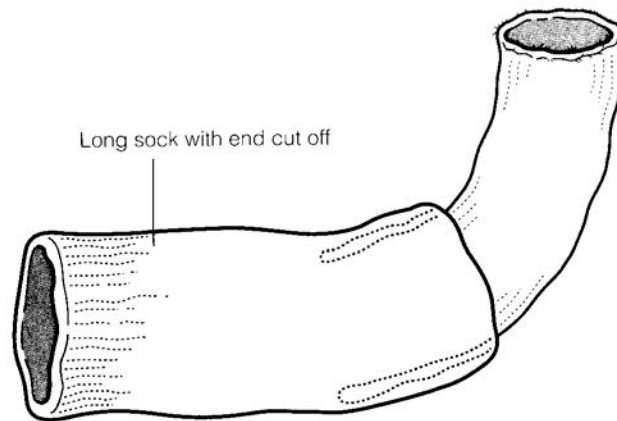
Students should fill in the correct answers in their blank Table 3.

Intussusception

Show the students what happens to the bowel in intussusception. Cut the end of a long sock before the lesson. The sock represents the bowel. Show that part of the bowel swallows another part of the bowel (Picture 19).

Intussusception is where one part of the bowel swallows another part. This usually happens near the appendix. Intussusception is very dangerous. It can stop blood reaching part of the bowel and, if this happens, that part of the bowel will die. Later, food and faeces will leak out of the bowel, causing peritonitis.

Diagnosis: When you examine the abdomen you may feel a swelling to the right of the centre of the abdomen.



PICTURE 19 *How intussusception happens*

Treatment: Send patients who have a swelling and pain in the abdomen immediately to a hospital where operations are done. Intussusception causes an intermittent pain in the centre of the abdomen. Later, the pain may become constant. The patient may also pass blood with his faeces.

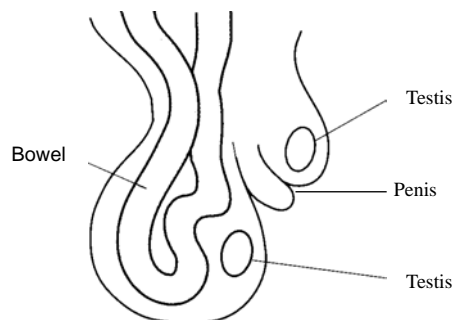
Ask the students what to write in each space of the intussusception row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Incarcerated hernia Men often get swellings in the scrotum. These swellings are commonly caused by a hernia, a hydrocoele or orchitis. Women can also get hernias.

POSTER 9:
(Prepared poster)

Swellings in the scrotum (hernia, hydrocele and orchitis)

Copy pictures 20, 21 and 22 onto Poster 9.



PICTURE 20 *Hernia*

• Hernia

A hernia is when part of the bowel comes through a weakness in the abdominal wall. This is often into the scrotum, or at the fold between the abdomen and the leg. A hernia is usually a painless swelling. The hernia may become incarcerated (trapped) and painful. An incarcerated hernia is a painful swelling which is normally near the private parts.

LESSON 8 Abdominal problems

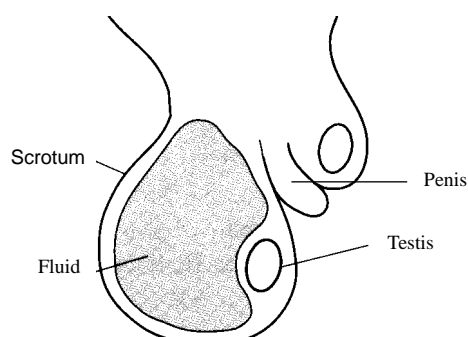
Diagnosis: Feel at the top of the scrotum or at the fold between the abdomen and the leg. Lay the patient down. Try to push the swelling slowly back into the abdomen. With a hernia, you can normally push the swelling back into the abdomen. With an incarcerated hernia, the bowel does not go back into the abdomen. This is very dangerous because it may stop blood from reaching part of the bowel. This will cause peritonitis.

Treatment:

- If a patient has a painful swelling near the private parts, send him immediately to a hospital where operations are done.
- If a patient has a painless hernia, send him to surgical outpatients at hospital.

Ask the students what to write in each space of the incarcerated hernia row of the table. Fill in the correct answers on Poster 7.

Students should fill in the correct answers in their blank Table 3.



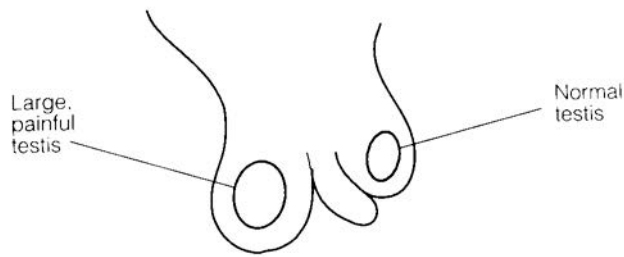
PICTURE 21 Hydrocoele

• **Hydrocoele**

A hydrocoele is a bag of fluid in the scrotum. It is often caused by filarial worms. Filarial worms are transmitted by a mosquito. The worms block lymph vessels and prevent fluid leaving the scrotum.

Diagnosis: Hydrocoeles are not painful. You can feel the top of a hydrocoele at the top of the scrotum. Lay the patient down. Try to push the swelling slowly back into the abdomen. You cannot push a hydrocoele back into the abdomen when the patient is lying down.

Treatment: Send patients with a very large hydrocoele to surgical outpatients at hospital.



PICTURE 22 *Orchitis*

• **Orchitis**

Orchitis is an infection of one or both testes (testicles).

Diagnosis: The testicle or testicles are large and painful to touch. There may be discharge from the penis and pain when the patient passes urine. If the pain came on suddenly, and the man is less than 30, he may have a testicular torsion. This is more likely if the young man is vomiting and one testicle (usually the left testicle) is lying high and horizontal in the scrotum.

(To untwist the testicle, imagine that you are opening a book, twist the testicle outwards 180 degrees. You might have to do this several times before the testicle resumes its lower position, hanging vertically. Then refer for fixing the testicle inside the scrotum so it doesn't happen again. Don't try if more than 6 hours of pain.)

In women: sudden onset or severe lower abdominal pain could be torsion of an ovary or an ovarian cyst. The pain will usually be accompanied by nausea and vomiting. These women will also need surgery in hospital.

Treatment:

- If a patient with orchitis treat him for chlamydia and gonorrhoea (see appendix 26) or send him to the sexually transmitted disease clinic. Ask the patient's partner to go with him.
- If the patient has mumps - a swelling of one both parotid glands at the angle of the jaw - the patient does not need antibiotics. Mumps orchitis is caused by the mumps virus.

Ectopic pregnancy Ectopic pregnancy causes a constant pain in area 5, 6 or 7. If a woman has pain in area 5, 6 or 7, ask about her last period. If her last normal period was more than 6 weeks ago, she may be pregnant and have an ectopic pregnancy (see Lesson 7). Send her immediately to a hospital where operations are done. Give her 5 ml oral rehydration solution every minute.

Ask the students what to write in each space of the ectopic pregnancy row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Pelvic inflammatory disease (PID) Pelvic inflammatory disease is a sexually transmitted disease. The uterus and the fallopian tubes are infected. If the infection in the fallopian tubes reaches the peritoneum, the patient may develop peritonitis.

Diagnosis: Pelvic inflammatory disease causes constant pain in area 5, 6 or 7. This pain is worse during sexual intercourse.

Treatment: Send her to the sexually transmitted disease clinic. Ask her partner to go with her. They will both need treatment.

Ask the students what to write in each space of the pelvic inflammatory disease row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Typhoid fever

Typhoid is caused by drinking water or eating food made dirty with human faeces. Patients with typhoid may become very ill after 2 or 3 weeks. Typhoid may damage the bowel and cause peritonitis. Typhoid can also cause sepsis.

Diagnosis: Typhoid causes a fever which comes and goes. A patient with typhoid usually has a headache, feels tired and is often constipated. He may have a cough. If a patient is unwell with a high fever but the pulse is not fast this is often caused by typhoid sepsis.

Treatment: Cross out the box below that does not apply in your country.

In malaria areas

Treat for malaria if a test is positive. If the fever is no better after 5 days, and a blood test shows that the patient does not have malaria, send them to hospital. Typhoid is one cause of a fever which continues for more than a week. One option to treat typhoid that is not severe is ciprofloxacin 500mg tablets twice a day for 5 to 7 days.

In areas where there is no malaria

Tell the patient to go to hospital if the fever is no better after 5 days.

Ask the students what to write in each space of the typhoid row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Volvulus

Show the students what happens to the bowel if the patient has a volvulus. Use the sock that you have prepared. Hold the two ends of the sock with one hand. Turn the loop of the sock around.

Volvulus is caused when part of the bowel turns around inside the abdomen. This stops faeces and air moving inside the bowel. Volvulus may also stop blood from reaching part of the bowel and cause peritonitis.

Diagnosis: Volvulus causes intermittent abdominal pain, usually in the centre of the abdomen or in area 6, vomiting and a swollen abdomen. A patient with a volvulus does not pass faeces or air from the anus.

Treatment: Send a patient who has a painful swollen abdomen immediately to a hospital that does operations.

Ask the students what to write in each space of the volvulus row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Refreshment break

Gastroenteritis and food poisoning

Gastroenteritis and food poisoning cause irritation inside the bowel. Gastroenteritis and food poisoning cause intermittent pain in the centre of the abdomen and in areas 12 and 6. Patients usually have diarrhoea and may vomit. Other people in the patient's home may have similar symptoms. Ask the students what to write in each space of the gastroenteritis and food poisoning row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Constipation

Constipation means that the patient has pain or difficulty in passing faeces. A patient may get constipation if they do not eat enough fruit and vegetables or drink enough fluids.

Diagnosis: Constipation may cause intermittent pain in areas 4, 5 or 6. It can result in tearing of the anus. If a patient has a tear in the anus, there will be a sharp pain every time the patient passes faeces. There may also be blood on the outside of the faeces.

Treatment: Advise a patient with constipation to eat plenty of fruit and vegetables and to drink plenty of fluids. If the patient has pain in the anus, tell her to put vegetable oil in and on the anus every time she passes faeces until the pain has gone. Remind the patient to wash their hands with soap (or ash) and water after they do this. Sometimes medicine may be needed to treat constipation. (See list of medicines and their uses.)

Ask the students what to write in each space of the constipation row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Urinary tract infection

Urinary tract infections are caused by bacteria. It is easier for bacteria to get into a woman's bladder than into a man's bladder. Bacteria may travel into a woman's bladder after sexual intercourse or during pregnancy.

Ask your students to call out the symptoms of a urinary tract infection. Look for the following answers:

LESSON 8 Abdominal problems

Answer Pain on passing urine

Answer Passing urine more often than usual or urgently. This may cause urinary incontinence.

Answer Children crying when they pass urine.

Answer Pain in the lower abdomen

The patient may have another illness if they pass urine more often than usual or have blood in their urine:

- If a patient passes large amounts of urine, more often than usual, they may have diabetes - check the urine for sugar. (Diabetes also makes vaginal thrush more common, so ask about soreness of the vulva and vaginal discharge.)
- If a patient passes blood in their urine, they may have schistosomiasis in some areas. See appendix 17.
- If a patient has pain on passing urine they may instead have a sexually transmissible infection. Ask about other symptoms of a sexually transmissible infection (pain during sexual intercourse or unusual discharge from the vagina). If a patient has pain in area 3 or area 9 or a fever they may have a kidney infection. These patients may need a different treatment (see below).
- Check the urine for nitrites if you can. Nitrites in the urine usually mean that there is a urinary tract infection. White cells in the urine can be from a urinary tract infection or from a sexually transmissible infection.
- If you think that a man has a urinary tract infection we suggest that you examine their testicles and their prostate gland (use a lubricated gloved finger in the back passage). If the prostate is tender: treat for prostatitis with ciprofloxacin 500 mg twice a day for 2 weeks.

Teach the students about diabetes mellitus, using Appendix 16. Teach students how to interpret urine results if they can do urine microscopy or use urine test strips. Use Appendix 17 for this.

Treat women with a urinary tract infection with an antibiotic (for example treat with nitrofurantoin 100 mg two times a day for 3 days). If the patient is pregnant and you think she has a urinary tract infection: give amoxicillin 500 mg three times a day for 5-7 days. Ask her to return if she is no better after finishing the antibiotics. Send patients with possible diabetes to hospital if they have lost weight or have ketones in the urine.

Ask the students what to write in each space of the urinary tract infection row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Kidney infection (pyelonephritis)

Sometimes the bacteria that cause a urinary tract infection can infect the kidneys. A patient with a kidney infection has fever and pain in area 3 or 9. They will also have symptoms of a urinary tract infection. Send the patient to hospital. If the patient is not unwell and is not pregnant consider giving ciprofloxacin 500 mg x2/day for 5 days.

Ask the students what to write in each space of the kidney infection row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct

answers in their blank Table 3.

Kidney stones

(stones in the ureter) Kidney stones are very painful. This problem causes intermittent pain in areas 3 or 9. Give the patient ibuprofen 600 mg three times a day until the pain has gone.

- If the patient is vomiting, put the ibuprofen into their rectum. Tell the patient to drink plenty of fluids. Give the patient 5 ml of fluid every minute if they are vomiting.
- If the patient has vomited four times or more this morning, send them to hospital. This is a general danger sign.
- If the patient also has a fever, treat them for a urinary tract infection.

Ask the students what to write in each space of the kidney stones row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Hepatitis A

Viral hepatitis A is the most common cause of jaundice, but the illness is often mild and the jaundice may not be noticed. Hepatitis A and Hepatitis E are caused by drinking water or eating food made dirty with human faeces. Hepatitis B and C are more serious illnesses transmitted sexually or by dirty needles.

Jaundice is also caused by severe malaria and by infection with other parasites. Some medicines can cause jaundice. These include medicines for tuberculosis, for HIV, for psychiatric problems, and paracetamol.

To diagnose jaundice, ask the patient to look upwards. If the white part of their eyes are yellow, the patient has jaundice. Only look for jaundice in sunlight. Send all patients with jaundice to hospital urgently.

If the cause of the jaundice is hepatitis A, the patient needs no treatment and the jaundice usually improves in 2 weeks. Advise patients with hepatitis to rest, to eat a mixed diet and not to drink alcohol for 3 months.

If medicines could be the cause of the jaundice, tell the patient to stop taking the medicines.

If the jaundice does not improve within 2 weeks the patient should be tested for hepatitis B and C. Both hepatitis B and C can cause cirrhosis (scarring of the liver) and liver cancer. Treatment may be available for both hepatitis B and C.

Ask the students what to write in each space of the hepatitis row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

Rectal prolapse

Rectal prolapse is where the lowest part of the bowel comes out of the anus. Children with malnutrition sometimes develop rectal prolapse if they have diarrhoea or a lot of whipworm.

The first thing to do is to push the rectum back into the anus. Use some vegetable oil to help the rectum slide back in. Next, send the patient to hospital. Tell someone to hold the patient's buttocks together on the way to the hospital

to stop the rectal prolapse coming out again. They should also be treated with albendazole to treat whipworm.

Ask the students what to write in each space of the rectal prolapse row of the table. Fill in the correct answers on Poster 7. Students should fill in the correct answers in their blank Table 3.

The students can put their completed Table 3 on the wall at their health centre.

SECTION 3: When to refer patients to hospital

Make sure each student has a copy of Appendix 18: 'How to treat a patient with abdominal pain or with blood in the faeces'. Give the students two examples of abdominal problems and show them how to use Appendix 18.

SECTION 4: Practical

Activity Tell the students that this activity is about how to treat three patients who have abdominal problems. Divide the students into groups of five or six. Give them the following three examples. Tell them to use Table 3 and Appendix 18 to answer the questions about each patient. Give the students 30 minutes. Then ask each group what they think the answers are.

Patient 1 Siti is a 24-year-old woman. She has had constant pain in area 6 for 3 days. Siti has had a fever. She has vomited one time today. She has pain when she passes urine. The pain is not made worse when she has sexual intercourse. Her last normal period was 2 weeks ago. Siti is able to walk easily. She is not anaemic. Area 6 is tender. There is no guarding and no rebound tenderness.

- What questions are important to ask because she is a woman?
- What illness do you think Siti has?
- How will you treat her?

Patient 2 Peter is 17 years old. He has had pain in his abdomen for 2 days. At first the pain was intermittent in the centre of his abdomen. Now it is constant in areas 7 and 8. He has vomited three times today. He has a fever and is sweaty. Peter walks slowly and bends forward. Peter's abdomen is tender. When you press in areas 7 and 8 you find that he has guarding and rebound tenderness.

- What illness does Peter have?
- How will you treat him?

Patient 3 Mario is 54 years old. He has had constant pain in area 12 of his abdomen for 2 months. The pain gets better when Mario eats. Sometimes he vomits. Mario tells you that he was given aspirin one month ago. His pain gets worse when you press area 12. He does not have guarding or rebound tenderness.

- What was wrong with the treatment that Mario was given one month ago?
- What illness does Mario have?
- How will you treat Mario?

Answers

Ask the students to give their answers. Give them the correct answers:

- Patient 1**
- When was your last normal period?
 - Does your pain come at the same time as your period?
 - Do you feel pain when you have sexual intercourse?
 - A urinary tract infection. She may have malaria.
 - Send her to hospital.
- Patient 2**
- Appendicitis.
 - Send him immediately to a hospital where operations are done.
- Patient 3**
- Do not give aspirin to patients who have abdominal pain. Aspirin can cause peptic ulcers.
 - Mario may have a peptic ulcer.
 - Prescribe Mario omeprazole. If he is worse (or has black tarry stool) or is no better after 2 weeks he should go to hospital. Tell him not to take aspirin or ibuprofen and advise him not to smoke.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. Name eight causes of peritonitis.
 - *Appendicitis*
 - *Perforated peptic ulcer*
 - *Intussusception*
 - *Incarcerated hernia*
 - *Ectopic pregnancy*
 - *Pelvic inflammatory disease*
 - *Typhoid*
 - *Volvulus*
2. A patient has abdominal pain. What questions should you ask her?
 - *Do you have any problems when you pass urine?*
 - Are your bowels all right?
 - When was your last normal menstrual period?
 - Does your pain come at the same time as your period?
 - Do you feel pain when you have sexual intercourse?
 - Show me where you feel the pain.
 - What type of pain do you feel? Is the pain constant or intermittent?
 - Is there anyone else at home who has the same symptoms as you?

Lesson 9

Blood vessel and heart problems

BEFORE THE LESSON

- There are six posters in this lesson. (See p.4 for information on how to use the posters.)
- Prepared poster: 1
Student answer posters: 2-6
- You will need several tape measures suitable for measuring waist circumference and a height measure
 - You need a male student to volunteer to allow you to draw two crosses on his back.
 - Encourage each student to download a copy of the diagnosisandtreatment.org manual. This will allow them to read this lesson and also allow them to access appendix 23 - Healthy heart advice; Appendix 42 - Protocol for preventing strokes and heart attack; appendix 43 Type 2 Diabetes Protocol; Appendix 44 - Activity for option 2 - using the Reduce my chance of stroke website; and Appendix 45 - Choosing blood pressure medications in different countries.
 - For section 4: you need a patient (or two) who have heart failure with crackles in both lungs or swollen lower legs. Ask the patients to meet you in the classroom after the refreshment break. Tell them that you will give them a small reward for coming. Do not forget to bring a reward with you to the lesson.
 - Show four students how to measure blood pressure. Teach them how to teach this to other students.
 - Show four students how to listen to the lower part of both lungs and ask them to share this skill with their fellow students.
 - You will need stethoscopes and equipment for measuring blood pressure.
 - Print off the questions on page xxx and give one question to each of 4 students to ask you when you are teaching about *When to use other medication to prevent strokes and heart attacks*.
 - After the lesson you may choose to teach students how to share decisions about keeping the heart healthy. Teach them individually in the clinic. Please see the chapters on shared decision-making and lifestyle medicine.

Lesson plan

1 Quiz

2 Diagnosis and management of blood vessel and heart problems

3 When to send patients to hospital

4 Practical - measuring blood pressure and how to look for heart failure

5 Answers to the quiz

SECTION 1: Quiz

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

POSTER 1:

(Prepared poster)

1. What problems can high blood pressure cause?
2. What options might a person with high blood pressure choose to reduce their blood pressure and to reduce their chance of having a heart attack and stroke?
3. What treatment may save the life of a patient who has had a myocardial infarction?
4. How should you care for someone who has had a stroke?
5. What would you find when you examine a patient who has heart failure?

SECTION 2: Diagnosis and management of blood vessel and heart problems

Blood vessel and heart problems are important causes of illness and death in all parts of the world. Heart problems are more common in:

- people who smoke;
- in people who are inactive;
- in people who have diabetes
- people who have unhealthy eating habits .

Today you will learn about three groups of problems:

- high blood pressure and the problems caused by high blood pressure including stroke
- angina and myocardial infarction
- heart failure

Today you will also learn about preventing strokes, heart attacks and blood vessel problems. We do not teach you about diabetes in this lesson, but we would recommend that you read appendix 16 about diabetes and appendix 43: Type 2 Diabetes clinic protocol.

High blood pressure

The heart pumps blood around the body inside tubes called arteries. If these arteries become narrow, the heart has to work harder to push the blood around. You can tell how hard the heart is working by measuring the blood pressure. If the blood pressure is high, the heart is working harder than usual. Another name for high blood pressure is hypertension. For most people high blood pressure is when the systolic (top) blood pressure is above 140 mmHg.

Illnesses caused by high blood pressure

Ask the students what illnesses can be caused by high blood pressure.

A Stroke (Cerebrovascular incident)

A stroke is also called a cerebrovascular incident, or a CVI for short. A stroke is usually either caused when an artery leading to the brain is blocked (by a clot), or if an artery bleeds into the brain. If either of these happen, part of the brain dies. A stroke can cause weakness on one side of the patient's body, weakness on one side of the face, and/or an inability to speak properly. A stroke can also cause death.

A stroke is a medical emergency. Ask the patient to smile; to raise both arms; and to repeat a sentence. If any of the above symptoms (**f**ace droop, **a**rm weak, **s**peech difficult) comes on suddenly: they need urgent medical care - so act in a **t**imely manner. The letters **f a s t** will help you to remember this. When a patient has a stroke they should be well hydrated.

Only give blood pressure medication in the first 48 hours after a stroke if their blood pressure is above 180/115.

Consider sending patients to a stroke centre (a place where there is a scanner and clinicians trained to manage strokes), especially if they can get there within four and a half hours of the onset of a stroke.

Perhaps 30% of strokes in Low and Middle Income Countries (LMIC) are caused by a bleed rather than a stroke.

If you know that the patient has had a blocked artery (but not a bleed), then

POSTER 2:
(Student answer
poster)
Answers

POSTER 2:

Answers

aspirin is usually helpful. An early brain scan can rule out a bleeding stroke.

Bleeding strokes are more often severe. If the stroke is mild and seems to be improving, give aspirin if a scan is not available.

If the stroke is moderate or severe, and you can not get an early brain scan, do not start aspirin until 2 weeks after a stroke.

Giving the patient aspirin for a blocked artery (clot) stroke reduces the chances of another stroke by making the blood less sticky. Start with 300 mg aspirin as soon as possible at the onset of a stroke (when the brain scan does not show a bleed in the brain). Give a quarter of a tablet of aspirin (75 mg) (or clopidogrel) every day for the rest of the patient's life. (Sometimes aspirin is given in combination with either dipyridamole, or clopidogrel, for the first 30 days.)

If a patient has stroke symptoms that last less than 24 hours, you can assume that the stroke was caused by a blocked artery (a clot), and use aspirin straight away. This is called a TIA or a Transient Ischaemic Attack. A mini stroke that gets better within a day.

Check the heart rhythm. If the patient has an irregular heart rhythm they may need special treatment for atrial fibrillation (for example apixaban or edoxaban). An ECG (an electrocardiogram) will diagnose atrial fibrillation. Atorvastatin (for example 20mg daily) will also prevent some people from dying. Partly by reducing cholesterol.

Advise patients to stop smoking. Lifestyle, and medications, to control blood pressure are very important. Patients will choose lifestyle options and may be happy to let you recommend medications. Encourage regular physical activity (work or exercise).

Myocardial infarction

Heart failure

Blindness or kidney failure

Heart failure, myocardial infarction, stroke and kidney failure can kill people. High blood pressure is dangerous. A patient with high blood pressure is two times as likely to die in the next year as a patient with normal blood pressure.

There are two types of blood pressure:

1. the diastolic blood pressure, which is the lower blood pressure. The pressure in the arteries when the heart is relaxed and filling with blood from the veins.
2. the systolic blood pressure, which is the upper blood pressure. The peak pressure in the arteries when the left ventricle is pumping blood out of the heart.

In people who are not pregnant: the systolic blood pressure is better at telling us who might have a future stroke, or a future heart attack.

In pregnancy: the diastolic blood pressure is more important than the systolic blood pressure. If the diastolic blood pressure is 95, or higher, they should see a midwife urgently to make sure that they do not have pre-eclampsia. Women planning pregnancy, or who are pregnant, need different medicines to treat their high blood pressure. The safety of the baby is important and high blood pressure in pregnancy is different.

If any patient has a diastolic blood pressure that is 130 mmHg, or more, and takes no blood pressure medicine, they will probably die in less than a year.

Although high blood pressure can cause damage to the heart, brain, kidneys and eyes, most people with high blood pressure feel well and have no symptoms. By treating high blood pressure and encouraging lifestyle improvements, many strokes and deaths will be prevented. Reducing blood pressure is probably the most important way to prevent strokes.

Erectile dysfunction is also more common in men who have damage to their arteries. This is the reason that the website asks about erectile dysfunction. Erectile dysfunction is brought on by smoking and drinking alcohol hazardously. However, most men with erectile dysfunction have an emotional cause for their erectile dysfunction. Read about the use of sildenafil in the list of medicines and their uses.

When you work in a primary healthcare facility you will see plenty of people with high blood pressure, type 2 diabetes, obesity, high cholesterol numbers, possible sleep apnoea, a smoking habit or hazardous alcohol use. These are the people whom you will need to support to prevent strokes and blood vessel problems. If you are testing urine and doing blood tests you may also diagnose chronic kidney disease. Chronic kidney disease is linked to blood vessel problems and increases your chance of having a stroke or a heart attack.

POSTER 3:

(Student answer poster)

Risk factors and diseases

1 **What is a risk factor?** Please give me an example:

A risk factor is something about a person, or a patient, that makes it more likely that they will suffer from an illness in the future. The higher their risk, the greater the chance of something bad happening in the future.

Examples:

- High blood pressure
- High salt intake can cause high blood pressure. But low sodium salt does not cause high blood pressure. Low sodium salt contains a lot of potassium chloride and less sodium chloride.
- Obesity (linked with sleep apnoea). This is best measured using the waist to height ratio.
- A high cholesterol ratio (the total cholesterol number divided by the HDL cholesterol).
- Sleep apnoea syndrome
- Smoking
- Hazardous and harmful alcohol use (linked with sleep apnoea) (see the chapter on lifestyle medicine)

2 **What is a disease?** Please give me an example:

An illness. A state of being unwell. Some diseases can cause death. Many diseases cause disability.

Examples:

- Stroke
- Myocardial infarction (heart attack)
- Angina
- Heart failure

3 **What diseases are also risk factors for other diseases?**

Examples:

- Diabetes
- Chronic kidney disease (this is often picked up by finding protein in the urine)

Protocols for preventing strokes, heart attacks and blood vessel problems

Appendix 42 tells you how to help people with risk factors for future stroke and blood vessel disease. Appendix 42 tells you what to ask, what to measure and what to test. Of course, you may not be able to do some tests in your healthcare facility. For example, cholesterol tests can be expensive (and cholesterol tests are often not helpful).

When you have answers, measurements and test results, you can then share a prediction of the future with your patient.

Ask your patient if they want help with any of their risk factors. Offer to support them to reduce their chance of stroke and other diseases.

Option 1 Some sharing of the choices with the patient:

In a busy clinic you will often prefer to simplify the best ways to treat high blood pressure and type two diabetes. Option 1 is an attempt to keep treatment simple. The example clinic data sheet in appendix 42 is a suggestion of the measurements and tests that will help your patients.

We encourage you to give your patients a copy of their records, so that they can see what decisions are being made to help them. The high blood pressure protocols and type 2 diabetes protocols simplify how to help people to reduce their blood pressure and their diabetes symptoms; and how to reduce their chance of stroke and heart attack. Your patients will usually accept your recommendations for medication as long as the medicines don't make them feel unwell. Deciding on what lifestyle improvements are possible for them, will partly depend on how well the patient understand their choices. We suggest that you show lifestyle videos in the waiting room of the clinic.

Appendix 23 is a useful handout that you can give to patients who have high blood pressure; diabetes; or another risk factor (that puts them at a higher risk of having a future stroke or heart attack). Our collection of lifestyle videos also help people to make decisions about lifestyle changes.

Option 2 Sharing the future with the patient:

We have created a website that allows people to find out what their future chance (risk) of stroke or heart attack is. The website teaches people what key information they need to discuss with their clinician; how much benefit they will get from each lifestyle improvement; how much benefit they will get from taking each medication. The website gets people ready to make decisions, together with their clinician.

If you speak Nyanja please use this link for the website: <https://chepetsani.patientcentre.org/calc/home>

In your area it might be useful to know the normal numbers for cholesterol test results. For example in South Luangwa, Zambia, the average total cholesterol is 4.45 and the average HDL cholesterol is 1.14. If you don't have personal cholesterol numbers: use the average local numbers in the website instead.

For English speakers please use this link for the website: <https://alpha.patientcentre.org/calc/>) to [Reduce my chance of stroke](#) or other diseases.

Activity for option 1

Please try acting out the following 2 examples of people with risk factors. These patients want your help. John and Lydia are asking for treatment and are worried about their future health. We suggest that you work with a study partner. Each of you should take turns to role play the clinician and the patient.

LESSON 9 Blood vessel and Heart problems

1 John is your first patient. He is aged 65. Black African. He wants to know what to do about his blood pressure.

John's answers, measurements and test results:

Height 164 cm, weight 65 kg, waist 88 cm. His waist to height ratio is 0.54.

Urine dip test is negative for glucose, protein and blood. So, John does not have diabetes and kidney disease is unlikely.

His pulse is regular. He does not have atrial fibrillation.

His blood pressure numbers today are 160/96, 154/98 and 158/94.

He smokes 2 cigarettes a day, but he doesn't drink alcohol.

He has never been diagnosed with sleep apnoea, but he tends to nod off a lot when not in bed and he snores a lot.

His recent HIV test was negative.

What medication would you recommend for John?

What lifestyle options does John have to reduce his chance (risk) of stroke and heart attack?

There is one choice of medication:

- Blood pressure tablets

There are several lifestyle options:

- Aim to reduce his waist towards an ideal waist of 82 (half of his height). The 16 and 8 eating plan will help with this.
- Healthy eating.
- Sitting less and moving more.
- Stop smoking. Smoking reduces John's life expectancy by 7 years (because he is a light smoker).

What would you do if you were John? Your job is not to tell John what to do, but to support John to make a decision that is right for John. But John will probably take your recommendation of any medication that will not make him feel worse.

John decides, with your support, to not take a medication just yet. John is happier to:

- reduce his stroke chance by sitting less and moving more - he will use his phone to make sure that he will do 10,000 steps a day.
- and he plans to eat more healthily: avoiding fruit juices and sugar in drinks; preferring to eat uncooked porridge oats rather than cooked nsima (maize flour). He also plans to use a smaller plate and to avoid larger options at restaurants.
- You support John to make a decision about how to bring his blood pressure down with activity and by reducing his waist size.
- John's waist measures 88 cm. That is more than half of his height (164 cm). His ideal waist would be 82 cm. But he decides that he would like his waist to measure 84 cm, within 3 months. He knows that reducing his waist size will probably stop him from snoring and give him more energy during the day.
- John chooses to follow the 16 and 8 eating plan. This means that for some days in the week he will only eat during 8 hours of the day. For the other 16 hours of the day: John will avoid all food. This means that he can only drink water, or have drinks with no sugar nor milk, during those 16 hours in each day. For John this means missing breakfast and having a late brunch at 11 am. He will stop eating by 7 pm on the evening when he is fasting.

2 Your second patient is Lydia. She is aged 65. White African. She wants to know what to do about her blood pressure and her cholesterol numbers.

Lydia's answers, measurements and test results:

Height 166 cm, weight 90 kg, waist 105 cm. Her waist to height ratio is 0.63.

Urine dip test is negative for glucose, protein and blood. So, Lydia does not have diabetes and kidney disease is unlikely.

Her pulse is regular. She does not have atrial fibrillation.

Her blood pressure numbers are 166/98, 164/98 and 162/94.

None of her close family have had angina, or a heart attack, under the age of 60.

Total cholesterol 6.3, HDL cholesterol 1.1.

She doesn't smoke but she does drink alcohol.

She is happy to have an HIV test today. The result is negative.

What medication would you recommend for Lydia?

What lifestyle options does Lydia have to reduce her chance (risk) of stroke and heart attack?

There are two choices of medication:

- Blood pressure tablets
- Atorvastatin

There are several lifestyle options:

- Aim to reduce her waist towards an ideal waist of 82 (half of her height). The 16 and 8 eating plan will help with this.
- Healthy eating.
- Sitting less and moving more.

What would you do if you were Lydia? Your job is not to tell Lydia what to do, but to support Lydia to make a decision that is right for Lydia.

- Lydia decides with your support that she wants to try a blood pressure tablet, every day in the long term. You give her a prescription of enalapril, 10 mg tablets, 1/2 a tablet to take once a day, every day. (5 mg a day.) You warn her of the small chance that enalapril could cause an irritating cough, or even make her feel light-headed to start with.
- She is interested in taking atorvastatin, but atorvastatin isn't available free of charge in the clinic. She will consider taking it in future.
- She is also keen to get support in the village to become more active and to improve her eating plan.
- Lydia would like to get support to reduce her waist size. Her current waist is 105 cm and her height is 166 cm. Ideally her waist would be 83 cm, but she decides to get her waist down to 100 cm within 3 months.
- Lydia decides to stop drinking alcohol until her waist is down to 95 cm. She knows that alcohol contains carbohydrate and that alcohol also makes her more likely to eat unhealthy foods.
- She arranges to see the nurse again next week, to have her blood pressure repeated on treatment and to talk about what she might be able to do with support from the clinic and the village lifestyle programme.

(Activity for option 2 - See Appendix 44. Using the website for full shared decision making. You will need a computer, or a smartphone, and internet access to do this. It will take you 30 minutes. And an extra 30 minutes to explore all of the videos.

This is an activity to teach you how to support people to use the [Reduce my chance of Stroke](#) website, so that they are at the centre of their own decisions.)

Who needs treatment for high blood pressure?

John and Lydia made their choices above with your support, but sometimes you will be making a *recommendation* for a patient to take medication for their blood pressure. You would recommend medication for a patient who has a really high chance of becoming ill without medication. If that medication is usually really effective at protecting the patient from strokes and other blood vessel problems.

POSTER 4:

*(Student
answer poster)*

Answers

Please tell me which patients should almost always have medication or treatment when their average blood pressure is repeatedly high?

- If the average (systolic or top) blood pressure is 180 or more, start the patient on a blood pressure tablet. The risk of stroke is too high at this level and most patients and clinicians would choose to start medication.
- Lifestyle changes are also important for these patients.
- If the average diastolic (lower) blood pressure is 110 or more, start a blood pressure tablet.
- The higher the blood pressure, the more benefit your patient will get from being on medication. Encourage people who have a systolic blood pressure above 160 to consider medication.
- If a patient has an average blood pressure between 140 mmHg and 150 mmHg we suggest that you only give medicine to reduce the blood pressure if the patient is unable to make lifestyle improvements.
- During pregnancy: If the DIASTOLIC blood pressure is 95 mmHg or more, send the woman to hospital this week. If the diastolic blood pressure is 100 mmHg or more, send the woman to hospital today.

POSTER 5:

*(Student
answer poster)*

Answers

What things can increase your chance of getting high blood pressure?

- Obesity (a high waist to height ratio)
- Inactivity
- Unhealthy eating habits - too much normal salt, not enough fruit/vegetables/ whole grains/ seeds/ nuts. Low sodium salt does not put your blood pressure up.
- Sleep apnoea syndrome - linked to obesity or to harmful alcohol consumption
- Kidney disease
- Smoking
- Diabetes
- A family history of high blood pressure
- Being older
- Medicines, herbal remedies and recreational drugs*
- Rarely thyroid or other hormone problems
- Rarely narrowed arteries to the kidneys

* Non-steroidal anti-inflammatory drugs (NSAIDs) - such as ibuprofen, aspirin and naproxen, steroids, cough and cold remedies, cocaine and amphetamines, some antidepressants such as venlafaxine, liquorice and steroid containing "herbal remedies" and occasionally the combined oral contraceptive pill.

Unhappily high blood pressure is becoming much more common in Low and Middle Income Countries (LMICs). This is a result of all of the above things becoming more common. In your clinic there is only so much that you can do to tackle these things.

The reduce my chance of stroke and heart attack website will help people and patients to choose where to start with this list of things.

POSTER 6:
(Student answer
poster)
Answers

Tests:

What do you think your clinic should test to help people with high blood pressure?

- **Test urine** (glucose) or blood (blood glucose or HbA1c) for diabetes. However, your clinic may not have access to these tests. A compromise is to check if the patient has obvious diabetes symptoms and only to test the urine for glucose etc if they pass urine 4 times or more at night.
- Test blood (urea and electrolytes) or urine (protein or blood) for kidney disease (a urine test for Albumin Creatinine Ratio is not generally available in LMICs) .
- Consider testing for hormone problems such as under active thyroid depending on how common hormone problems are in your area. For example Thyroid Stimulating Hormone.
- Measure the **waist to height ratio** to help people to understand that a ratio of more than 0.5 means that stroke is more likely because of more high blood pressure, sleep apnoea.
- Consider measuring total cholesterol and HDL cholesterol numbers of individuals if it will affect people's decisions about using medications to reduce their chance of stroke and heart attack. An alternative is to find out what the average local cholesterol numbers are.
- Expensive investigations such as electrocardiograms (ECGs), echocardiograms or 24 hours urine tests for metanephrines will very rarely change what you are able to do to improve people's health in LMICs.
- For people with an average blood pressure above 180 (systolic) or 110 (diastolic) it may be worth doing an ultrasound of the kidneys and bladder to look for changes in kidney size and any suggestion of narrow arteries to the kidneys. Especially in patients under 55 years.
- Individual people with high blood pressure will most likely know the reasons for their high blood pressure from answering a few questions on the reduce my chance of stroke and heart attack website and from making a few simple measurements.

Blood pressure should be routinely measured (at least once a year), for all adults seen in your health facility. If your patient has high blood pressure you will need to repeat their blood pressure measurement to check what their average blood pressure is. Treatment will usually be planned using the patient's average blood pressure.

Pregnant women will also have their blood pressure measured whenever they come to clinic. For example, every 2 weeks in the last 3 months of pregnancy. If the patient is a pregnant woman, different treatment is needed. See eclampsia and pre-eclampsia in Lesson 7.

How to calculate the average blood pressure

Measure a patient's blood pressure three times.

To calculate the average blood pressure: ignore about the first blood pressure. add up the 2nd and 3rd blood pressure measurements and divide this number by 2. The answer will be the average blood pressure.

Note that: Pain and anxiety can both increase your blood pressure. Sometimes seeing a doctor or a nurse can increase some people's blood pressure. Consider measuring the blood pressure at home if you think this happens.

LESSON 9 Blood vessel and Heart problems

If a patient has an average blood pressure of 150 mmHg or more, send him or her to a high blood pressure clinic. The blood pressure clinic should look for a cause of the high blood pressure and any damage done by the blood pressure. This may involve a urine dip test to check for blood, protein and glucose, a blood test to check the kidneys and salts (a U+E test). Sometimes they may also arrange an ultrasound of the kidneys and bladder. The clinic should also make sure that the patient does not have sleep apnoea syndrome or diabetes.

How to choose which medication to use for high blood pressure:

If the average systolic blood pressure is 180, or more, the patient will probably need 2 medications (and sometimes more), to bring their blood pressure down. Of course, lifestyle changes will also help. And treating sleep apnoea (by losing weight if needed, and cutting back alcohol intake if needed), will often make a big difference to blood pressure.

Moduretic (also known as triuretic) (hydrochlorothiazide 50 mg with amiloride 5 mg) is a good choice for these patients, since it has 2 medications in it, but the correct dose for high blood pressure is a 1/4 of a tablet every day, long term. These medications are not a good choice for patients who have attacks of gout or for pregnant women.

Enalapril 5 mg (half a 10 mg tablet), every day long term, is a good choice for most people, but occasionally (in 1 in 10 people) it can cause a dry cough. It can take a while for the cough to start, and a while for the cough to stop after stopping enalapril. Enalapril should not be used by women who are planning to become pregnant or who are pregnant. Nor should they use most other medications that are usually used for high blood pressure.

Amlodipine 5 mg, every day long term, is a good choice for most people, but occasionally it can cause ankle swelling towards the end of the day. If this happens: reduce the dose to 2.5 mg a day (half a 5 mg tablet).

Spironolactone 12.5 mg, every day long term, is occasionally needed for patients with extremely high blood pressure. The pharmacy may stock this as 50 mg tablets (and the dose for high blood pressure would be 1/4 of a tablet each morning), or as 25 mg tablets (and the dose would be 1/2 of a tablet each morning).

Nifedipine is known to bring blood pressure down, but there is no good evidence that it prevents strokes. So, it is not recommended as a long term treatment for high blood pressure, unless a woman is either pregnant or planning to become pregnant. Nifedipine is sometimes used when the systolic blood pressure is found to be very high (above 200 for example) for emergency treatment in the short term.

Atenolol is also known to bring blood pressure down, but there is no good evidence that it prevents strokes. So, it is not recommended as a long term treatment for high blood pressure. Atenolol is sometimes used when the patient has angina, to slow the heart rate down, but it should not be used if the patient has asthma (atenolol can make the wheeze or breathlessness much worse) or if the patient already has a pulse rate less than 60 at rest.

It is very important that the patient knows to avoid nonsteroidal antiinflammatories (NSAIDs eg ibuprofen, diclofenac, naproxen) and steroids whenever possible, since these medicines cause fluid retention and raise blood pressure. Some sex hormones including oestrogen, in the combined oral contraceptive, should usually be avoided.

Apart from making sure that your patients are not taking medication like NSAIDs it is important to check that the patient is using the medications that you have recommended regularly and that they

don't cause them any unwanted symptoms. There is no point in adding in another medication to lower their blood pressure unless you know that they are taking the first medication regularly.

Diabetes is an important risk factor for future strokes and heart attacks

It is possible to make type 2 diabetes go into remission. This means that type 2 diabetes can get better. For example 86% of people who have type 2 diabetes and are overweight will find that their diabetes goes into remission if they can healthily lose 15% of their body weight. Doing this and preventing people with pre-diabetes from developing diabetes prevents strokes and heart attacks and the other complications of diabetes. Both reducing waist size and metformin prevent the complications of diabetes. Metformin is a safe and effective treatment that can be used in people who have pre-diabetes (glucose levels are higher than normal but not at a diabetic level) to prevent diabetes.

Robert, aged 43, a black African man has just been diagnosed with type 2 diabetes. Despite this, his current 10 year chance of stroke or heart attack is low, at 2%.

- Robert hasn't noticed any symptoms of diabetes (thirst, passing more urine, tiredness or thrush infections). He is not keen to start metformin at this appointment.
- He is happy to look at his waist to height ratio and to look at his lifestyle.
- His waist to height ratio is 0.61 (height 174 cm, waist 106 cm). His blood pressure was measured twice today: 115/66 and 111/68.
- The reduce my chance of stroke website offers Robert metformin, and also suggests that he considers a low GI eating plan for his type 2 diabetes.
- Robert is very unhappy about being told that he has diabetes. His mother also had type 2 diabetes and died of a stroke recently. Robert decides with clinician support to sit less and move more. For him this means cycling to work.
- Robert is happy to come back with his wife and to learn more about the low GI eating plan. But since he can't afford porridge oats, he agrees to eat roller-meal rather than nsima (refined cornmeal). He decides that he will drink less alcohol.
- Robert's ideal waist would be 87 cm. He decides to aim for his waist size being 101 cm within 3 months.
- He agrees that if his urine still has sugar in it in 6 months time that he will go on metformin. He also agrees to start metformin if he gets symptoms of diabetes.

When to use medication for type 2 diabetes:

Most patients with type 2 diabetes will choose to start metformin. It is a very safe medication. If the patient has symptoms with diabetes (thirst, passing a lot of urine, weight changes) please check that they don't have type 1 diabetes (see above - ketones in the urine, a particularly high blood glucose and recent weight loss suggest type 1 diabetes).

If the patient has symptoms of diabetes and does not have type 1 diabetes, please start them on metformin straight away (unless they have severe kidney failure).

The dose of metformin will need to be increased very slowly to avoid side effects (loose stool or nausea). Start by taking 1/2 of a 500 mg tablet with the main meal.

Increase the dose very slowly, for example the dose can be increased every month by 1/2 a tablet. So after one month the patient will be taking 1/2 a tablet with 2 main meals per day.

If the patient gets side effects, consider dropping the dose.

Finally, the patient will aim to get the dose up to 500 mg with each main meal (for example 500 mg, 2 times a day).

Some patients with bad diabetes symptoms will prefer to increase the dose of metformin more quickly. Metformin reduces the sugar levels, but mostly it protects the blood vessels and prevents strokes and heart attacks. If the patient has bad side effects: consider giving them 1/4 tablet with each meal. Again, increase the dose very slowly.

Again it is very important that you avoid nonsteroidal antiinflammatories (NSAIDs) in people with diabetes. Some people who have had diabetes for some time may have a problem with neuropathic pain especially in their feet. Consider using low dose amitriptyline (eg 5 mg at night) to treat this.

The Waist to height ratio. What is healthy?

Measure the circumference of a person's waist just above the belly button (this is halfway between the top of the hip bone and the bottom rib). Divide this number by the person's height (both in centimetres). If the number is more than 0.5, they are much more likely to have sleep apnoea syndrome, high blood pressure and other problems linked to having a high waist to height ratio. The waist to height ratio is a better measure of health than the body mass index (BMI).

If a person may be overweight, as well as having another health issue such as high blood pressure, type 2 diabetes or sleep apnoea syndrome, check their waist to height ratio and encourage them to consider how they might bring their waist size down to half of their height with community or clinician support.

The ratio should also be higher than 0.4. Lower than 0.4 would suggest that the patient is unhealthily thin. They may also need clinician support.

Activity

In pairs: measure each other's height and waist circumference. Divide your waist by your height. This is your waist to height ratio. If your waist to height ratio is not healthy, decide what your waist should measure to give you a healthy waist to height ratio. (For example, half your height.)

When to use other medications to prevent strokes and heart attacks

We suggest that you ask a different student to ask each of the following questions:

Question: Is there a medication that we should be offering to treat people with diabetes and pre-diabetes?

Answer: If your patient has type 2 diabetes, or pre-diabetes, metformin is a safe and effective option to prevent strokes and heart attacks. Metformin reduces the blood sugar level, the risk of heart attacks and strokes. But blood pressure medicines and statins can also be used to reduce the risk of heart attacks and strokes. And of course, life-style changes also reduce weight, blood sugar levels and the risk of heart attacks and strokes.

Question: If your patient has a moderate (10-19%), or a high (greater than 20%), chance of having a stroke or heart attack in the next 10 years your patient may choose to take a statin. Please give me an example of a high intensity statin.

Answer: Most patients who have a 20% (or higher) chance of stroke or heart attack in the next 10 years, would choose to take a medication like atorvastatin. These medications are very safe. It is extremely rare to get muscle soreness, or other problems, with 20 mg of atorvastatin taken once a day. The toolkit will show you how much benefit that your patient would get if they took either a high intensity or a moderate intensity statin for 10 years.

You may decide together to use atorvastatin 20 mg daily. This dose is regarded as a high intensity statin. If they get side effects with 20 mg of atorvastatin they can try 5 mg and then 10 mg or atorvastatin.

Question: Does the toolkit allow for the extra risk of stroke or heart attack that is linked with HIV and its treatment?

Answer: No. Please remember that people living with HIV have a higher chance of having a stroke or heart attack (multiply their chance number by 1.5). The toolkit currently does not currently work this out for you. Some HIV medicines are safer than others when available.

Question: What should we do if someone has already had a (clot) stroke, heart attack or has narrowed leg arteries (peripheral vascular disease)?

Answer: These people are much more likely to have another stroke or heart attack, so they will get much more benefit from taking the following medications:

- atorvastatin 20 mg (and often 80 mg) daily
- aspirin 75 mg daily after food (clopidogrel is a more expensive medication that does the same job as aspirin, with the same risk of bleeding from the stomach or gut)
- blood pressure medications if the systolic blood pressure is above 140 mm/Hg
- metformin if the patient has diabetes
- People who have heart failure, or angina, will also need medication to improve their symptoms but they will also need a number of medications to help them to live well, longer. Usually, a doctor will recommend these medications to them.

Angina and myocardial infarction

Question: Can anyone explain what happens when a person has angina or a myocardial infarction?

Answer: The coronary arteries are tubes that take blood into the heart muscle.

- If the coronary arteries are very narrow, the heart muscle is painful when the patient is exerting themselves. This is called angina. Angina pain normally feels like the inside of the chest is being squeezed, crushed or grabbed. The pain of angina is sometimes in the neck or left upper arm. The pain of angina stops when the patient rests. The pain does not last for longer than 20 minutes.
- If the coronary arteries become blocked some of the heart muscle will die. This is called a myocardial infarction or a heart attack. The pain of a myocardial infarction is the same as angina pain. The pain of a myocardial infarction normally lasts for more than 20 minutes. Patients who are having a myocardial infarction are often cold, sweaty and anxious. Patients often feel nauseated. They may vomit. Many patients die soon after a myocardial infarction.

Question: Name one important preventable cause of angina and myocardial infarction. How would you treat someone with a myocardial infarction or angina?

Answer: Smoking can make the coronary arteries narrow. Usually, only people who are more than 40 years old have angina or myocardial infarctions. If you think a patient has had a myocardial infarction, give them an aspirin tablet (300 mg) immediately. This will stop some patients from dying.

Send patients who have angina, or have had a myocardial infarction, to a heart unit or a hospital. At hospital the patient may be given other medicines. Give all patients who have angina, or have had a myocardial infarction, a quarter of a tablet of aspirin (75 mg) every day, for the rest of their lives.

Aspirin makes myocardial infarction less likely. They should also take a high intensity statin tablet daily for the for the rest of their lives. For example atorvastatin. The dose chosen will depend on personal preference. 80 mg daily of atorvastatin is often used for life after a myocardial infarction or a clot stroke. Advise these patients to stop smoking. Advise them that regular physical activity (work or exercise) is good, but that they should avoid strenuous exercise if it causes chest pain.

SECTION 3: When to refer patients to hospital or clinic

TABLE 1 When to refer patients to hospital

Heart problem	Symptoms or signs	Treatment
Stroke	Weakness on one side of the patient's body, weakness on one side of the face, or an inability to speak properly. A stroke is a medical emergency. If any of the above symptoms (face droop, arm weak, speech difficulty) comes on suddenly. They need urgent medical care.	See above. Consider sending to a stroke centre.
Heart failure	Fast breathing but no fever and has crackles in both lungs, or swelling of ankles, liver, and neck or face	Send to hospital immediately
Angina or myocardial infarction	Squeezing pain, crushing pain or grabbing pain in the middle of chest. Sometimes in the neck or left upper arm	Give aspirin 300 mg. Send a hospital immediately
High blood pressure All patients	Blood pressure 190/120 mmHg and above	Send to blood pressure clinic (or hospital) immediately
	Average Blood pressure 150/105 mmHg and above	Send to clinic for investigation and treatment of high blood pressure
High blood pressure Pregnant women	Diastolic Blood pressure 95 - 99 mmHg	Send to hospital this week
	Diastolic Blood pressure 100 mmHg and above	Send to hospital immediately

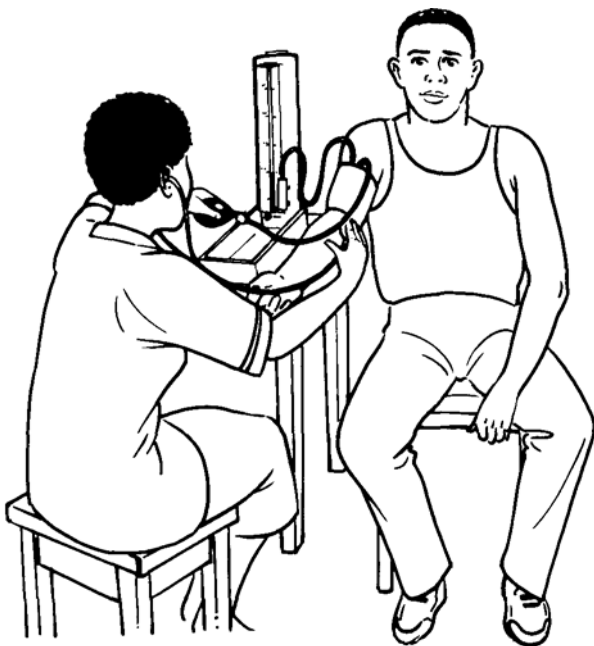
Refreshment break

SECTION 4: Practical



How to measure blood pressure

Divide the students into four groups. Ask your four student helpers to teach each group how to measure the blood pressure (Picture 24). Each student will practise measuring the blood pressure of another student, who will play the patient. Show them how to use the type of blood pressure equipment that you have locally. Make sure that the students know which size of cuff to use.



Arm circumference	Cuff size (width x length)
22-26 cm	12x22 cm (small adult)
27-34 cm	16 x30 (adult)
35-44 cm	16x36 (large adult)
45-52 cm	16 x42 (extra large adult)

PICTURE 24 *Measuring blood pressure*

1. Ask the patient to sit down. Sometimes the patient can only lie down.
2. Remove all the clothing from the patient's right arm.
3. Put the blood pressure cuff tightly around the upper part of the right arm. Put the cuff at least 2 cm above the bend in the arm. The bladder (inflatable part) of the cuff should cover at least the front part of the arm.
4. The patient's palm should face upwards. Ask him to rest his hand on the table next to him. Put the blood pressure measurement scale on the same table.

If you do not have an electronic blood pressure machine:

5. Put the stethoscope in your ears. Put the other end of the stethoscope on the front of the bend in the arm, on the part that is closest to the patient's body.
6. Turn the valve so that, when you press the rubber bulb, air stays in the cuff. Press the rubber bulb several times until the measurement scale is above 200 mmHg. Alternatively, feel the radial pulse as you pump up the cuff and go 20 mmHg above the reading when no pulse is felt.
7. Open the valve slowly, a small amount at a time, until air escapes slowly from the cuff. Listen for a noise each time the heart beats. You will only hear this noise between the top blood pressure (systolic blood pressure) and the bottom blood pressure (diastolic blood pressure).
 - If you do this too quickly you will get the blood pressure wrong.
 - If you do this too slowly you will hurt the patient.

- If you do this at the correct speed you will hear a noise as the heart beats each time the mercury comes down 4 mmHg.

8. When you hear the first noise look at the top of the mercury or at the needle. Read the number. This is the top blood pressure. When the noise first becomes very quiet or stops. read the number. This is the bottom blood pressure. Write down the two blood pressures: for example. BP 140/90.

- If the patient is a pregnant woman or has a fever or anaemia, the noise becomes *quiet* after you reach the bottom blood pressure.
- If the patient has high blood pressure. the noise occasionally disappears between 180 mmHg and 160 mmHg. This is *not* the bottom blood pressure. The noise comes back again as the mercury or needle comes down further.

Electronic blood pressure machines will automatically inflate around the upper arm and then give the two blood pressure readings for you to write down.

9. The first time that a person is found to have high blood pressure (above 140/95) their blood pressure should be checked with the patient seated and then 1 minute after standing. If the blood pressure drops 20 mmHg, then all future blood pressures should be measured standing.

Heart failure

The heart is a bag of muscle that pushes blood to all parts of the body. Heart failure causes fluid to collect in parts of the body. often in the lungs, or lower legs. If you find fluid under the skin in the lower legs consider sending the patient to hospital immediately.

Fluid in the lungs may cause fast breathing. Heart failure is not the only cause of this. TB can also cause fluid in the space next to a lung, often with painful breathing and usually fever. And patients with pneumonia also have fast breathing (and usually fever).

- If a patient has fast breathing and a fever, treat them for pneumonia. If they are no better after treatment, consider sending them to hospital. They may have heart failure.
- If a patient with fast breathing does not have a fever. Listen to their chest. Listen to the lower part of both lungs. If you hear crackles in both lungs. Consider sending the patient to hospital immediately. They may have heart failure.

Ask a male student to take off his shirt. Draw two crosses on the student's back 5 cm below the scapulae. Show them how to listen to the chest (Picture 23).

Put the stethoscope in your ears and put the other end on one of the crosses. Ask the patient to breathe in and out deeply. Listen carefully. Listen for a crackling noise. Listen to both sides of the chest. If you can hear a crackling noise on both sides of the chest, the patient probably has heart failure.

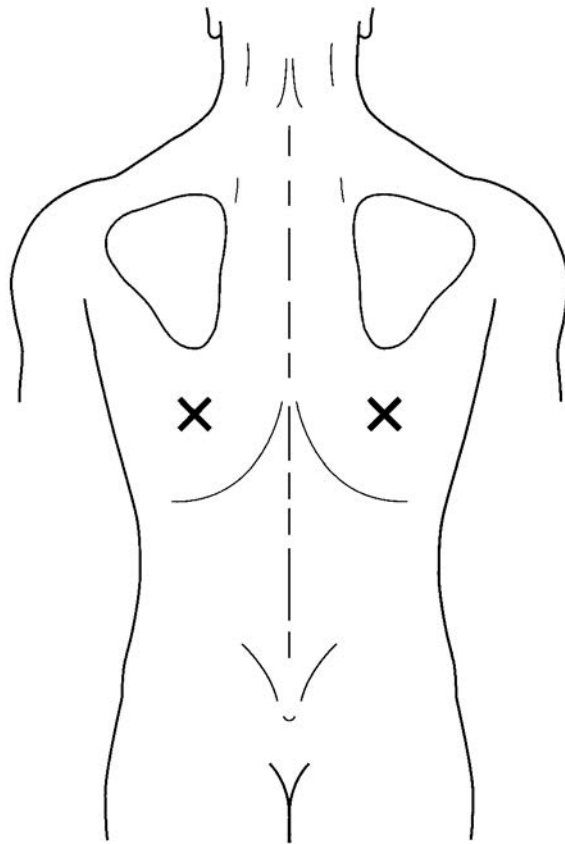
Heart failure can be caused by:

- severe anaemia
- high blood pressure
- myocardial infarction
- tuberculous pericarditis (tuberculosis of the bag around the heart)
- rheumatic heart disease
- congenital heart disease
- in South and Central America Chagas disease is a common cause of heart failure.

Treat these patients with healthy heart advice (Appendix 23). Where available, they may be given enalapril, bisoprolol and diuretics.

LESSON 9 Blood vessel and Heart problems

Patients with congenital heart disease, or rheumatic heart disease, are usually given intramuscular benzathine penicillin every 3 weeks for the rest of their life. Give patients who weigh 30 kg or less 0.6 million IU. Give all other patients 1.2 million IU.



PICTURE 23 *Where to listen for heart failure*

How to look for heart failure

Activity

Now tell the students to divide into two groups and ask the two patients with heart failure to come into the class. Ask one group to listen for crackles in the lungs and look at the legs of the two patients. Ask the other group to listen for crackles in the lungs and look at the legs of two students. After 10 minutes, change groups. Ask the student helpers to help the groups to listen for the crackles and look for fluid under the skin of the legs of the two patients with heart failure.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question.

1 What problems can high blood pressure cause

- Stroke (Cerebrovascular incident)
- Myocardial infarction (heart attack)
- Heart failure
- Kidney failure
- Blindness

2 What options might a person with high blood pressure choose to reduce their blood pressure and to reduce their chance of having a heart attack and stroke?

- Eat healthily
- Sit less and move more
- If they may have sleep apnoea: Drink alcohol safely and avoid obesity. Aim for a healthy waist to height ratio, between 0.4 and 0.5.
- Take regular blood pressure tablets if their average systolic blood pressure is persistently above 140.
- Treat type two diabetes and pre-diabetes with metformin to reduce the chance of heart attack and stroke.

3 What treatment may save the life of a patient who has had a myocardial infarction?

Give the patient aspirin 300 mg immediately (and 75 mg every day for the rest of their life). Send the patient to hospital.

4 How should you care for someone who has had a stroke?

- Make sure that the patient is well hydrated. If they cannot swallow safely they will need a nasogastric tube.
- Only give blood pressure medication in the first 48 hours after a stroke if their blood pressure is above 180/115.
- Consider sending patients to a stroke centre, especially if they can get there within four and a half hours of the stroke.
- Unless you can get an early brain scan, do not start aspirin until 2 weeks after a stroke. For blocked artery strokes take 75 mg daily after food. An alternative is clopidogrel 75 mg after food. Both should be used long term.
- If a patient has stroke symptoms that last less than 24 hours, you can assume that the stroke was caused by a blocked artery, and use aspirin straight away.
- Check the heart rhythm. If the patient has an irregular heart rhythm, they may need special treatment for atrial fibrillation (for example apixaban or edoxaban).
- Atorvastatin (for example 20mg daily) will also prevent some people from dying.
- Advise patients to stop smoking.
- Lifestyle and medications options to control blood pressure are very important.
- Encourage regular physical activity (work or exercise).

5 What would you find when you examine a patient who has heart failure?

- Fast breathing or swollen legs.
- You may hear crackles in both lungs.

• Lesson 10 **Accidents, emergencies, joints and the back**

BEFORE THE LESSON

- There are 16 posters in this lesson. (See p. 4 for information on how to use the posters.)
- Prepared posters: 1, 8, 11, 12
- Student answer posters: 2, 3,4,5,6,7,9,10,13,14,15,16. Only write the title on Poster 15 - the students will complete Poster 15 during the lesson. (There are no summary words.)
- Give each student a copy of Appendix 19.
- You need a bed or a table at the front of the class for the role play in section 2.
- Practise before the lesson.
- Ask one student to help you with the demonstration in section 4. Give the student a copy of the demonstration and practise with her before the lesson.
- For the role play you need clothes, a piece of rope, some leaves, a cup of water, a short stick and piece of cloth.

Lesson plan

1 Quiz

2 Diagnosis and management

3 When to send patients to hospital

4 Practical

5 Answers to the quiz

SECTION 1: Quiz

POSTER 1:
(Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

- 1 If a patient has been hit on the head, what questions should you ask him?
- 2 What are the main causes of anaphylaxis:
 - in health centres?
 - at home?
- 3 What can you do to help a patient who has shock after an accident?
- 4 How will you examine a patient who has a painful knee?

SECTION 2: Diagnosis and management

Most of today's lesson will be told as a story about **you**. You have finished your training as a primary health care worker. You are now working in a health centre.

On the first day, you will see many problems which are accidents and emergencies.

On the second day, you will see patients who have back or joint problems.

On the third day, you will see five patients with back pain.

Accidents and emergencies

Head injuries

On the first day you are cycling to work. You find a man who has driven his car into a mango tree. The man has blood on his head. The man is breathing but he does not answer or move when you shout in his ear.

POSTER 2:

(Student answer poster)

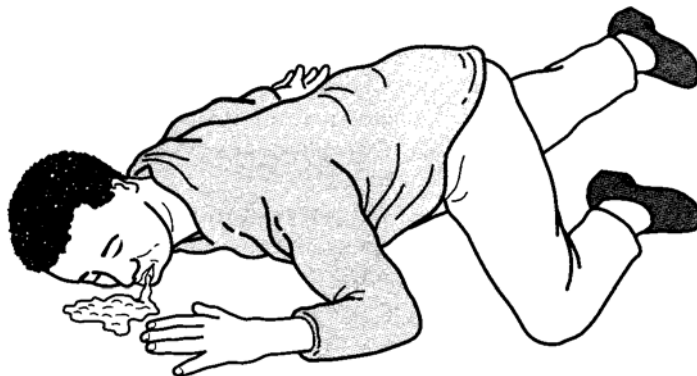
How to treat a patient with a head injury

Ask the students what four things they should do for a patient with a head injury.

Do not move the head until you **get help** from two or more people. **Put the head in line with the body**. Make sure the head cannot move. **Move the patient to a safe place**.

As soon as possible, **lay** the patient **on his side** in the coma position. This will help him to breathe.

Put a student volunteer into the coma position (Picture 25) in front of the other students.



PICTURE 25 *The coma position*

POSTER 2:

(Student answer poster)

Use two fingers to **remove** any **vomit from his mouth**. Make sure that his **tongue is not at the back** of his **mouth**.

Send the patient to **hospital** with a record card. On the record card write the time of the accident or the time when you found him.

Ask four students to show the class how to treat a patient with a head injury. Tell them what they do correctly and what they could do better.

You continue to cycle to work. You are stopped by Maryam who is worried about her son Tobias. Tobias was hit on his head by a coconut this morning. You need to ask Maryam five questions. If Maryam says 'yes' to any of these questions you must send Tobias to hospital immediately. Tell Maryam to take Tobias to hospital immediately if she can say 'yes' to these questions.

POSTER 3:

(Student answer poster)

Five questions to ask patients with a head injury

Ask the students which questions to ask patients with a head injury.

1. Did he **lose consciousness** for more than 1 minute?
2. Is it **impossible to wake** him completely?
3. Has he **vomited three times or more**?
4. Has he got a **very painful headache** or a **large wound** on his head?
5. Does he have any **unusual feeling** in his arms or legs?

Cuts

Your first patient at the health centre, Sita, has a large cut on her arm. First, treat the wound. This is similar to treatment for skin ulcers (see Lesson 5). Next, send Sita to hospital to have the wound sewn together. This wound can be sewn together because Sita was injured today and the wound is bigger than 1 cm in size.

How to treat a wound

Ask the students to tell you how to treat a wound.

POSTER 4:

(Student answer poster)

1. **Clean the wound.** Use a syringe to squirt normal saline or clean water at the wound.
2. **Cut away** any eschar (dry, black, hard necrotic tissue), and slough (dead tissue, usually cream or yellow in colour) but do not remove black clotted blood.
3. Put **povidone iodine** 10% on the wound.
4. Cover the wound with a clean dressing. Consider putting unripe slices of papaya flesh underneath the dressing.
5. **Change** the dressing **every 2 days** until the wound is dry. Clean the wound very gently with povidone iodine or normal saline.
6. If the wound has been sewn together, **take out** the **stitches after 7 days**.
7. If the patient has not been immunised against tetanus, give her a tetanus vaccination this week. Give 0.5 ml **tetanus toxoid** intramuscularly. Give two more tetanus vaccinations, the first after 1 month and the second after 2 months.
8. Give another tetanus vaccination after 10 years, and another vaccination after another 10 years. A total of five injections will prevent tetanus for life.

Tell your students:

Good wound treatment is very important. Good wound treatment can help to prevent tetanus.

Broken bones

Your next patient, Yusuf, fell out of a tree this morning. He has pain in his right arm and his forearm is bent. You can see that a bone is pressing against the skin. The skin in that place is white.

POSTER 5:

(Student answer poster)

How to treat broken bones

Ask the students: How will you treat Yusuf?

Answer

1. If a bone is broken and presses on the skin, **make the bone straight** immediately. First, pull both ends of the arm or leg away from the broken bone. Next, make it straight. This will reduce bleeding and pain.

Answer

2. **If the skin is broken, cover the wound with a clean cloth.**

Answer

3. **If the wound is bleeding heavily, press** on the wound firmly until the bleeding stops.

Answer

4. **If a large bone** has been broken, **give** the patient **diazepam** rectally (see Appendix 4). Give the same dose as for treating convulsions. Diazepam reduces anxiety. If available, also give a strong medicine to reduce pain (tramadol for example).

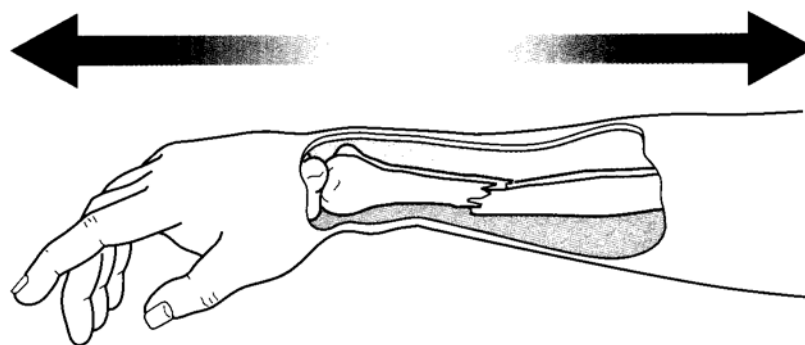
Answer

5. **Stop** the arm or leg **from bending** where it is broken. Place a straight stick next to the arm or leg. Tie the arm or leg to the stick with cloth.

Answer

6. **Send** a patient who has a **broken large bone to hospital** immediately.

Show the students Picture 26 of how to make a broken bone straight.



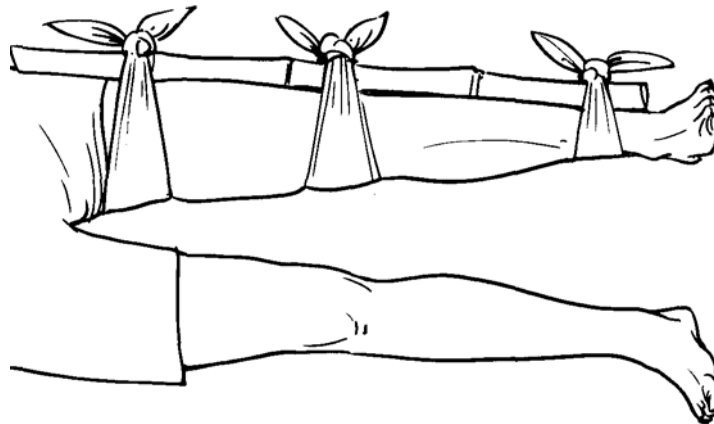
PICTURE 26 *How to make a broken bone straight*

Ask two students to help you. Ask one to play a patient with a broken arm. Ask the other student to pull the arm at the elbow. You will pull at the wrist.

Show the students Picture 27 of how to stop a broken leg from bending.

Ask the students: If a patient has broken a bone, but the bone is not bent, how can we tell that it is broken? Look for the following answer:

Answer If a bone is broken it will be painful when you push the ends of that bone together.



PICTURE 27 How to stop a broken leg from bending

Shock

Shock means that not enough blood is reaching the brain and other parts of the body. Shock is very dangerous. Patients with shock may become unconscious or die. Shock may be caused by:

- blood loss and broken bones
- anaphylaxis, which is a severe allergic reaction.

Tell the students that the heart beats fast in shock. Feel one of the arteries in the neck to count how many times the heart beats in 1 minute. Show the students where to feel. The movement of the arteries is called the pulse.

Hamida, your next patient, has broken her leg bone. Hamida feels light-headed. She tells you that she feels as if she might faint. She is sweating and cold. Her pulse is weak and faster than 110 beats in one minute. Hamida has shock caused by blood loss and a broken bone.

POSTER 6:

(Student answer poster)

How to treat shock from blood loss and broken bones

Ask the students: How will you treat Hamida?

- **Treat** the cause of the **shock**. **Stop** the **bleeding** if possible.
- Place a stick next to the broken arm or leg and **tie** the **stick to the arm or leg** with cloth.
- **Give** the patient **rectal diazepam** if she has broken a large bone.
- **Give** the patient **oral rehydration solution**. Give her 5 rnl (1 teaspoon) every minute.)
- **Send** the patient **to hospital** immediately.

Anaphylaxis

Next, the orderly calls for your help. He has just given a 24-year-old man an injection of procaine penicillin fortified. The patient has lost consciousness and is cold and sweaty. His pulse is weak and faster than 110 beats in 1 minute. The patient has shock caused by anaphylaxis.

There are three common causes of anaphylaxis:

- medicines - antibiotic injections, antibiotic tablets or vaccinations may cause anaphylaxis
- food - some people are allergic to some foods, for example nuts, prawns or squid.
- insect bites and stings - usually from bees and spiders.

POSTER 7: How to treat anaphylaxis

(Student answer poster)

Ask the students: How will you treat this patient?

To treat a patient with anaphylaxis:

1. Give them an injection of **epinephrine** (also called adrenaline). 1 in 1000, **intramuscularly**.
2. Give a **second** injection of epinephrine **after 10 minutes** if the patient is still unconscious or has a fast pulse.
3. **If** the patient is **still** unconscious or **unwell** 10 minutes after the second injection of epinephrine. **give** him a **third injection** of epinephrine. **Send** him **to hospital** immediately.
4. When the patient is well, **tell them** that **they have an allergy**.

Tell the patient what he is allergic to, if you know. Teach the patient and the patient's family that in future he must avoid the thing he is allergic to.

Tell your students: The dose of epinephrine is different for patients of different ages.

POSTER 8:

(Prepared poster)

Doses of epinephrine

Copy Table 1 onto Poster 8.

TABLE 1 Doses of epinephrine

Age of patient	Dose of epinephrine	
Up to 12 months	0.1 ml	—
1 year up to 5 years	0.25 ml	1/4 vial
5 years old or more	0.5 ml	1/2 vial

Kerosene poisoning Gabriel, your last patient of the day, is a 3-year-old boy. Gabriel has drunk some kerosene. To treat a patient who has drunk kerosene:
Send the patient to hospital.
Tell the patient to drink lots of young coconut juice or water on the way to hospital.
Do not make the patient vomit.

Rabies On your way home you pass through Kijini village. Earlier today the villagers killed a dog which had bitten two people. The villagers thought the dog had rabies.

POSTER 9:
(Student answer poster)

How to treat patients with bites from an animal

Ask the students what they should do for patients who are bitten by animals that may have rabies

1. **Wash wounds immediately.** The best cleaning fluids are iodine or alcohol. Iodine and alcohol kill viruses. However, water, with or without soap, will help. Even urine is better than nothing. Use a brush to clean the wound if possible.
2. **Send** the two patients **to hospital** immediately.
3. The patient will need to be given a course of rabies vaccinations as soon as possible. This is often kept by the local government vet.

Burns At home, your neighbour brings her 6-year-old son Raju to you. Raju has burnt himself. A large pan of hot water fell on his abdomen and the front of his right leg.

POSTER 10:
(Student answer poster)

Immediate treatment for burns

Ask the students: How will you treat Raju?

Immediate treatment for burns

1. **Wash** and cool the burn **with cold water**. Hold the part of the body that has been burnt underneath a running tap for about 20 minutes or in a bucket of cold water for the same length of time.
2. Do **not** break any blisters.
3. If the burn is dirty, clean it gently with normal saline or povidone **iodine** 10%.
4. Put **unripe papaya flesh** on the burn. This is a very good antiseptic. It helps the burnt skin to heal and also stops the skin sticking to the cloth.
5. If you have no papaya, paint the wound with **gentian violet**. Next, put some **vaseline, or vegetable fat which has been boiled and cooled**, on the burn to stop the skin sticking to the cloth.
6. **Cover** the burn **with a clean cloth**.
7. **Change** the dressings **every 2 days**.
8. Make sure that the patient has been immunised against tetanus. If not, give him **tetanus toxoid** as soon as possible.

**POSTER 10
continued:**

(Student answer poster)

9. **You do not** normally need to **give** an **antibiotic** to a patient who has a burn.

10. **If** the **burn** becomes covered with yellow or green **pus, smells bad or** is getting **bigger**:

- clean the wound again
- dress the wound with papaya, or gentian violet and vaseline
- treat the patient with **co-trimoxazole** for 5 days.

11. If the burn has **not started to heal after 1 week** send him to hospital.

Degree of the burn

To decide whether a patient needs to go to hospital you need to know:

- the degree of the burn
- the percentage of the skin area that has been burned.

POSTER 11:

(Prepared poster)

The three degrees of burns

The **degree** of the **burn** is the **depth** of the **burn**. There are three degrees of burn:

1. **First-degree** burns only affect the very **outside layer** of the skin. The skin is **red** and **tender**.
2. **Second-degree** burns affect the **outside and middle layers** of the skin. The skin becomes **blistered** and **tender**.
3. **Third-degree** burns affect the **outside, middle and bottom layers** of skin. There is no blistering of the skin in that area.

The skin may be **black or white**. The skin has no feeling and is **not tender**.

The skin is not able to grow back in a third- degree burn.

A patient with third-degree burns needs to go to hospital.

Percentage of skin

If a patient burns a large percentage of his skin area, he will lose a large amount of fluid and will get infections. Patients with burns should drink plenty of fluids.

Dehydration and infections may kill the patient.

A patient who has burnt 10% or more of his skin area needs to go to hospital.

A patient who has a burn on his face or private parts also needs to go to hospital.

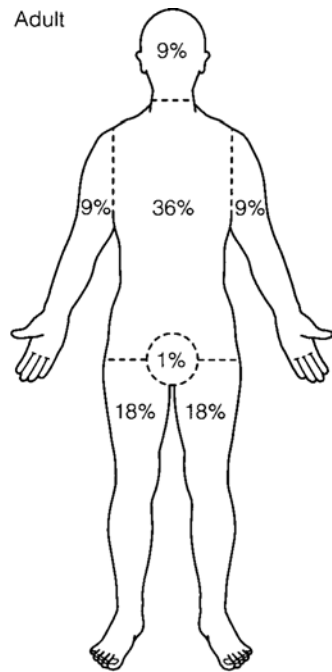
POSTER 12:

(Prepared poster)

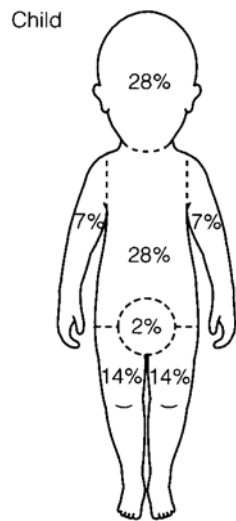
Percentages of skin area of each part of the body of a child and of an adult

Draw Pictures 28 and 29 on Poster 12.

LESSON 10 Accidents, emergencies, joints and the back



PICTURE 28 Percentages of skin area which cover each part of the body of an adult



PICTURE 29 Percentages of skin area which cover each part of the body of a child who is less than 12 years old

For example:

- The skin that covers the leg of a child is 14% of the total skin area. If a child burnt only the front of one leg, he would have a 7% burn .
- The skin that covers the whole of the chest together with the abdomen of an adult is 36% of the total skin area. In a child the same area is 28% of the total skin area. If an adult burnt only the front of the abdomen, he would have a 9% burn (a quarter of 36%). If a child burns only the front of the abdomen, he would have a 7% burn (a quarter of 28%).

Give the students three examples of patients who have burnt parts of the body. Ask the students to calculate the area of skin burnt on each patient. Show them how to work this out using Raju as an example:

Raju has burnt all of the front of his abdomen. This is 7% of his total skin area. Raju has also burnt the front of his right leg. This is 7% of his total skin area (half of 14%). In total, Raju has burnt 14% of his skin area. Send Raju to hospital for further treatment.

Refreshment break.

Joints and the back

On your second day at work, you see patients with joint and back problems.

Arthritis

Your first patient today is a 47-year-old man called Max. Max's knee has been painful and swollen for 4 days. You ask Max if the knee was injured. Max cannot remember hurting his knee. You ask Max if he has a fever. Max tells you that he has been hot and sweaty at night for 4 days.

POSTER 13:

(Student answer poster)

Things to look for in patients with joint pain

Ask the students what four things to look for if a patient has joint pain.

1. Look to see if the joint is more **swollen** than the joint on the other side.
2. Feel to see if the joint is more **hot** than the rest of the body.
3. Press the swelling to find out if it is soft or hard and bony. Ask the patient if the joint is **tender**.
4. Ask the patient to **bend** the joint. Ask him if it is **more painful** when he bends the joint.

A patient with arthritis has pain and swelling of one or many joints. Arthritis causes patients to have permanent and often increasing difficulty in using their joints. Arthritis is divided into two types: septic arthritis and other types of arthritis. The patient may have any of these types of arthritis.

Septic arthritis or gout

Septic arthritis must be treated immediately. If the patient has not been injured and has a soft, hot or tender swelling in one joint for just a few days, and bending the joint is very painful, the patient may have septic arthritis. Particularly if there is a fever or a fast pulse.

Max's knee has soft, tender swelling, but does not feel hot. It is painful to

bend his knee and he has not injured his knee. He may have septic arthritis. Gout is another possibility.

Send patients with possible septic arthritis to hospital immediately. If it will take longer than 6 hours for the patient to get to the hospital, give co-trimoxazole at twice the normal dose. If there is no fever, and the pulse is not fast, consider treating for gout with colchicine 500 µg twice a day for 6 days. If it is gout the pain will be improving within 1 or 2 days. Septic arthritis will usually get worse and the patient will become unwell with a fever and a fast pulse.

Other types of arthritis

Diagnose other types of arthritis if a patient has had pain for more than 6 weeks with hard or soft swelling around one or more joints. The most common other types of arthritis are osteoarthritis, gout and rheumatoid arthritis.

If a patient has severe pain in a single joint, but no fever - usually in the joint at the base of the big toe - he may have gout. Treat with colchicine 500 µg twice a day for 6 days. If the pain gets much better within a few days gout is confirmed. An alternative to colchicine is ibuprofen (see below) but only for a few days until the symptoms are much better. Ibuprofen can improve most types of arthritis but it does not help you to make the diagnosis and does not cure the problem and can cause unwanted symptoms.

If a single large joint (hip, knee, elbow, or wrist) is painful and stiff the patient may have TB arthritis. This usually comes on over more than 4 weeks. Consider an HIV test and TB tests (for example a urinary LAM test if the HIV test is positive and a chest X-ray and a sputum Gene-Xpert test).

If a patient has rheumatoid arthritis, he has swelling in the joints on **both** sides of the body. Two different joints **and** the joints in the hands will be swollen. The swelling is soft and may be warm and tender. Send patients with possible rheumatoid arthritis to see a joint expert (a rheumatologist) if possible .

- Treat other types of arthritis with paracetamol: two tablets four times a day. Tell the patient not to take more paracetamol than this dose. Higher doses can damage the liver.
- If paracetamol is not helpful, give ibuprofen 600 mg three times a day after food. Tell patients to stop taking ibuprofen if they get pain at the top of the abdomen. Advise the patient to bend and straighten each joint several times every day.

Osteomyelitis

Marcelle, your next patient, has pain in his upper leg, not in his joint. Marcelle has not had an accident. Marcelle cannot walk. The bone is tender. The upper leg is hot. Marcelle has osteomyelitis. Osteomyelitis is an infection of bone it can affect any bone. Give Marcelle twice the normal dose of co-trimoxazole and send him immediately to hospital.

Diagnosing and treating patients with back pain

Five patients with common and important types of back pain come to your health centre today. Your job is to decide which type of back problem each patient has.

POSTER 14:

(Student answer poster)

Seven questions for patients with back pain

Ask the students which seven questions we need to ask patients to find out the cause of back pain.

1. **How long** have you had back pain?
2. Have you had a bad fall or an **accident**?
3. Is the pain **worse after exercise**?
4. Is the pain **constant**?
5. Do you have a **fever**?
6. Is it **painful when** you **press** on a **bone** in the spine?
7. Ask the patient to lie on his back. Lift one leg at the hip but keep the knee straight. Do the same with the other leg. Ask the patient if there is **pain in the back and below the knee when you lift the leg**.

Give each student a copy of Appendix 19. Explain to the students that Appendix 19 summarises what they need to know to diagnose the cause of back pain.

Role plays

Tell your students that you will now role-play seven patients. Ask the students to ask you each of the seven questions.

- For question 6, ask a student to press on your spine bones.
- For question 7, lie on your back and ask a student to lift each leg as described above.
- When you role-play patient 3, tell the student that you feel pain in the back and below the knee when she lifts your leg.

Next, ask the students to tell you the diagnosis. Tell the students the treatment.

ROLE PLAY 1:

Patient 1 has had back pain for less than 2 weeks. The pain is often worse after exercise. She has a fever.

Diagnosis: The cause of back pain is fever. Fever causes pain in the muscles of the back.

Treatment: Test the patient for malaria if there is malaria in the area.

ROLE PLAY 2:

Patient 2 has back pain that gets worse after exercise and gets better after rest.

Diagnosis: The cause of back pain is the back muscles working too hard.

Treatment: Show the patient how to keep her back straight and bend her knees when bending over. Regular stretching exercises each morning and night will help. Paracetamol may be helpful.

LESSON 10 Accidents, emergencies, joints and the back

Tell the patient to return if their pain is regularly waking them from sleep or getting worse, especially if they have other symptoms such as night sweats or weight loss.

ROLE PLAY 3:

Patient 3 has pain in the lower back. The pain goes down one leg below the knee when the hip is bent. (Tell the student that you feel pain in the back and below the knee when she lifts your leg.)

Diagnosis: The cause of back pain is a disc prolapse. This is also called sciatica because the disc prolapse presses against the sciatic nerve. A disc prolapse happens when the gristle (soft part) between the bones in the spine is damaged and pushed out from between the bones of the spine. Sometimes this gristle is pushed against a nerve. This causes the pain of a disc prolapse.

Treatment: Tell the patient not to work for 2 weeks. He should start doing regular stretching exercises as soon as he can. Give him paracetamol. Offer him low dose amitriptyline (5-10 mg) at night, especially if his sleep is affected by the pain. Refer him to the orthopaedic clinic if the pain has not started to reduce after 2 weeks.

ROLE PLAY 4:

Patient 4 has had pain in the back for more than six weeks. The pain is constant. There is also pain when you press one of the bones in the spine. There may be a fever.

Diagnosis: The cause of back pain is tuberculosis of the spine.

Treatment: Send the patient to the tuberculosis clinic.

ROLE PLAY 5:

Patient 5 has had a bad fall or an accident. There is pain when you press one of the bones in the spine.

Diagnosis: The cause of back pain is a broken bone.

Treatment: Tell the patient to rest completely for 6 weeks. Give her paracetamol. If the patient does not rest she may damage the nerve in her spine. If she damages the nerve in her spine, she may never be able to walk again. After that the patient will need support to get her fitness back. If the patient has weakness in her legs or cannot feel part of her legs or around her anus, send her to hospital immediately.

SECTION 3: When to refer patients to hospital

POSTER 15:
(Student answer poster)

Write the title only on Poster 15 before the lesson.

Ask students to write reasons for sending a patient to the hospital on Poster 15. Tell students which of the answers they have written on Poster 15 are correct. Circle the correct answers on Poster 15 so all the students can see them. Look for the following answers:

- if a patient with a head injury says 'yes' to any of the five head injury questions
- if a large bone has been broken
- if a patient has shock caused by blood loss or broken bones
- if a patient has shock caused by anaphylaxis and is still unconscious or unwell after the second injection of epinephrine
- if a patient has drunk kerosene
- if a patient is bitten by an animal that may have rabies
- if a patient has third-degree burns or burns on more than 10% of the total skin area; if the patient has a burn on the face or private parts or a burn has not started to heal after 1 week
- if a patient has possible septic arthritis
- if a patient has possible osteomyelitis
- if a patient with a disc prolapse is no better after 2 weeks (send to the orthopaedic clinic)
- if a patient has had constant back pain for 6 weeks or more and part of the spine is tender (send to the TB clinic)
- if the patient has had an accident and has weakness in their legs or cannot feel part of his legs or around their anus

SECTION 4: Practical

Tell the students that this demonstration will show them how to treat snake bites. You need clothes, a piece of rope to represent the snake, some leaves, a cup of water, a short stick and three pieces of cloth. Ask one student to play the woman who is bitten by the snake. You will play the farmer. Practise the demonstration with the student before the lesson.

Demonstration

- Woman:** Ahhhh ... I've been bitten by a dangerous snake!
Farmer: Do not worry. Most snakes do not make dangerous poison.
Woman: That's nice to know.
Farmer: Lie down and let me wipe the bite with a piece of cloth.
Woman: Thank you.
Farmer: I'm going to stop your leg from moving. I will tie a stick next to the leg.
Woman: You are very kind.
Farmer: I will take you to hospital.
Woman: Thank you sir.

LESSON 10 Accidents, emergencies, joints and the back

Snake bites usually happen at night. People walk barefoot and stand on a snake, or reach for something with their hands. Therefore, more than 90% of all snakebites are on feet, lower legs and hands. Different types of snakes affect us humans differently, but most snake bites are not dangerous to humans. The effect of a bite on a person depends on the type of venom (poison) that is injected. Usually, the snake is only able to inject a small amount of venom. Half of all snake bites don't include venom. Not all snakebites that inject venom are a danger to humans as many snake venoms are mild.

How to treat snake bites

Ask the students how to treat snake bites. See Appendix 37 Venomous bites and stings for more detailed information.

POSTER 16:

(Student answer poster)

1. **Wipe** the **bite** with a piece of cloth. If the snake spat in the patients' eyes. **wash** the **eyes** thoroughly with water. Even urine will help if there is no water available. Do not cut or suck the bite.
2. Tell the patient **not to worry**. Most snakes do not inject dangerous venom.
3. **Stop** the bitten leg (or arm) **from moving**. Carry the patient to avoid the bitten leg from moving. Use a sling for the arm. **Send** the patient **to hospital**. At hospital the arm, or leg, will be lifted slightly (on two pillows), and the patient will be told to rest in bed. If the snake has already been killed, take it to the hospital together with the patient. If the snake is not dead, leave the snake alone. Remember that even a dead snake can still inject poison.
4. **If** the patient **vomits, turn them on their side**. This will prevent the patient from choking on the vomit.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. If a patient has been hit on the head, what questions are useful.
 - *Did they lose consciousness for more than 1 minute?*
 - *Is it impossible to wake them completely?*
 - *Have they vomited three times or more?*
 - *Has they got a very painful headache or a large wound to their head?*
 - *Does he have any unusual feeling in their arms or legs?*
2. What are the main causes of anaphylaxis?
 - *Medicines - antibiotic injections, antibiotic tablets and vaccinations*
 - *Foods - some people are allergic to some foods, for example, nuts, prawns or squid*
 - *Insect bites and stings - usually from bees and spiders*
3. What should you do to help a patient who has shock because of an accident?
 - *Treat the cause of the shock. Stop the bleeding if possible.*
 - *Give the patient oral rehydration solution. Give them 1 teaspoon (5 ml) of solution every minute.*

LESSON 10 Accidents, emergencies, joints and the back

- *If a large bone has been broken give the patient diazepam rectally. Place a stick next to the arm or leg and tie the stick to the arm or leg with cloth.*
 - *Send the patient to hospital immediately.*
4. If the patient has a painful knee, how will you examine it?
- *Look to see if the joint is more swollen than the joint on the other side.*
 - *Feel to see if the joint is more hot than the rest of the body.*
 - *Press the swelling to find out if it is soft or hard and bony. Is the joint tender?*
 - *Ask the patient to bend the joint. Is it more painful?*

Lesson 11 **Emotional health and epilepsy**

BEFORE THE LESSON

- There are seven posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared posters: 1,3, 5
Student answer posters: 2, 4, 6, 7
- There are five demonstrations in this lesson. Ask ten students to help you perform the demonstrations. Give each student a copy of the demonstration and ask them to practise the demonstration before the lesson. They may want to dress up for the demonstration.
- You need a mat or a rug for the first demonstration and some farming tools for the second demonstration.
- Cross out the box about sleeping sickness if there is no sleeping sickness in your area.
- Try to find a traditional healer, or a local counsellor, who is effective at treating anxiety and depression. Spend some time working with the traditional healer, or counsellor, to make sure that their practice is safe and helpful for people.
- For section 4: Consider asking the traditional healer, or counsellor, if they will teach your students. Tell them that your students may send patients with anxiety and depression to them if they know that they can help patients safely.

Lesson plan

1 Quiz

2 Diagnosis and management

Severe mental illness - delirium, schizophrenia, mania
Talking to people with emotional health problems
Depression and anxiety
How to identify emotional health problems
Epilepsy

3 When to refer patients to hospital or to a psychiatric nurse or doctor

4 Practical: Traditional healing

5 Post-natal depression

6 Suicide

7 Substance misuse

8 Medications for emotional health problems and epilepsy

9 Answers to the quiz

SECTION 1: Quiz

POSTER 1: *(Prepared poster)*

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. A patient is brought to you because they have been doing strange things for the past 5 days. They do not have a fever.
 - What questions should you ask to find out if they have a severe mental illness?
 - Where should you send them if you think they have a severe mental illness?
2. What are the important symptoms of depression?
3. What advice should you give to a patient who has epilepsy?

SECTION 2: Diagnosis and management

This lesson will teach you to help patients with emotional health problems.

There are many causes of emotional health problems. Health workers need to understand the local culture to be able to help a patient who has an illness that affects the way that the mind works. Culture means the beliefs and habits that are normal in the patient's community.

Traditional healers often treat patients with emotional health problems.

Traditional healers often know more about patients' culture than health workers. They are often good at treating illnesses like anxiety and mild depression. But severe mental illness, and illnesses of the body that affect the way the mind works, need medical treatment, not traditional medicine. Later in the lesson we will hear from a traditional healer about how they treat illnesses like anxiety and mild depression.

We will now talk about several patients with emotional health problems: severe mental illness, depression and anxiety. You will also learn about epilepsy. Epilepsy is not an emotional health illness. It is sometimes caused by damage to the brain. Epilepsy may make some patients more likely to suffer with depression or anxiety. Choosing the best treatment for emotional health problems needs special training. This lesson gives you an introduction to making emotional health and epilepsy diagnoses. The lesson also introduces you to some emotional health and epilepsy medications.

In areas with sleeping sickness: tell your students that they will also learn about sleeping sickness.

Severe mental illness

A patient has severe mental illness if he has one or more of these symptoms:

- hallucinations
- delusions
- thinking in a very unusual or disorganised way.

Patients with severe mental illness can also have symptoms of depression and anxiety. The symptoms of depression and anxiety are discussed later in this section.

POSTER 2:

(Student answer poster)

Questions for all emotional health patients

Ask your students to tell you what they should do if they think a patient may have an emotional health illness.

Ask: When you are **on your own**, do you hear peoples' **voices**? Do you often **see things** that are unusual (hallucinations) ?

Ask: Do you have any **ideas** that **other people say are not true** but **you know are correct** (delusions)?

Listen: **Listen** to **what the patient says**. If what he says **does not make sense** to you, his thoughts may be unusual or disorganised.

Ask: Have you been **sad** for **more than 2 weeks**?

The answers to these questions will tell you whether a patient has a severe mental illness or possible depression.

LESSON 11 Emotional health problems

There are many causes of severe mental illness (sometimes called psychosis). Severe mental illness may be caused by an illness of the body or by an emotional health illness. Illnesses of the body can sometimes affect the brain and cause mental illness. Illnesses of the body usually last for a short time and can often be cured. Emotional health illnesses usually last for a long time. Treatment can make emotional health illnesses better, but often the problem will come back again at difficult times.

It is particularly important that patients with HIV are examined for, and treated for, emotional health problems (depression, anxiety, mania, alcohol or substance misuse and either delirium or dementia). People with these emotional health problems can struggle to take ART regularly.

Common causes of severe mental illness

Illnesses of the body that affect the mind

(Delirium):

- alcohol withdrawal
- cerebral malaria
- meningitis including TB meningitis
- head injury
- alcohol intoxication, steroid medications, ART
- dementia
- HIV related brain disorders

Emotional health illnesses:

- schizophrenia
- mania

Demonstrations Explain to the students that they will now see three demonstrations which will help them remember how to diagnose different causes of severe mental illness. The demonstrations show patients with an illness of the body, with schizophrenia and with mania.

DEMONSTRATION 1: An illness of the body, that affects the mind (Delirium)

Ask one student to play the husband and one to play the wife. You need a mat or rug for this demonstration.

A 20-year-old man is sitting on a mat on the floor. He is restless, shouts and looks anxious. His wife is kneeling next to him and tries to comfort him.

Husband: Get those things away from me!

Wife: What things?

Husband: Those nasty little hairy animals! (Points to the corner of the room.)

Wife: I can not see any animals.

Ask your students to tell you which of the symptoms of severe mental illness this man has. Look for the following answer:

Answer: The man is having hallucinations.

Tell your students:

LESSON 11 Emotional health problems

This man works at the local sugar plantation. He normally spends most of his wages on alcohol. This week the bar has no alcohol so he has had no alcohol to drink. This man is ill with alcohol withdrawal. If someone drinks large amounts of alcohol regularly and then suddenly stops drinking alcohol, he may become ill with alcohol withdrawal. This causes the person to become anxious, shaky. He may have convulsions. Give him diazepam 10 mg by mouth, or rectally, or by intramuscular injection. Give him 50 ml of sugar water or milk. Next, send the patient to hospital. Repeat with 10 mg more diazepam after 30-60 minutes if needed. Patients with alcohol withdrawal will usually be given thiamine to protect their brain. Patients who are addicted to alcohol may consider using baclofen if they are motivated to stop drinking alcohol.

Alcohol intoxication, alcohol withdrawal, cerebral malaria, meningitis and a head injury are all illnesses of the body (also known as delirium) that can cause severe mental illness symptoms.

Tell the students how to treat a patient with symptoms of severe mental illness:

- If the patient has symptoms of severe mental illness and has been hit on the head, send them to hospital immediately.
- If the patient has symptoms of severe mental illness and has a fever, treat them for very severe febrile disease (see Chapter 2) and send them to hospital immediately.
- If a patient has symptoms of severe mental illness, but does not have fever and has not been hit on the head, send them to see a psychiatric nurse or doctor. Older patients with visual hallucinations and problems with their memory may be suffering from dementia. Because dementia is often linked to HIV: check HIV status and ensure ART is being taken. Visual hallucinations are more likely to be caused by an illness of the body than to be caused by mania or schizophrenia.

DEMONSTRATION 2: Schizophrenia

Ask one student to play the role of the boy and another student to play the role of his mother. You need two farming tools for this demonstration. A 16-year-old boy and his mother are talking to each other as they farm.

Mother: Why don't you talk to other people, Hassan?

Boy: The voices tell me not to.

Mother: What voices?

Boy: The voices that tell me that the people in our village are against me.

Mother: But Hassan, the people in the village like you. Where do these voices come from?

Boy: I hear the voices in my head when there is nobody there. I know that the people from the village hate me. They want to kill me.

Mother: Hassan, the people in the village are very worried about you. You have been behaving very strangely for the last few months. The people in the village do not want to kill you.

Boy: I know they do want to kill me. Nothing you can say will stop me knowing that!

Ask your students to tell you which of the symptoms of severe mental illness this boy has. Look for the following answer:

Answer: The boy is having hallucinations, he is hearing voices. The boy has delusions. He thinks the people in his village want to kill him. The people in his village do not want to kill him but the boy knows that he is correct. The boy has thoughts that are unusual.

Ask your students what could cause this boy's severe mental illness.
Explain what is wrong with the boy.

This boy does not drink alcohol. He has not been hit on the head. He does not have a fever. The boy is ill with a type of severe mental illness called schizophrenia. A person with schizophrenia cannot tell the difference between things that really do happen and things that do not happen. He may hear voices when there is nobody there. He may feel that he has no control over his thoughts or actions. For example, a patient with schizophrenia may say: 'Someone is putting thoughts into my head.' A person can be ill with schizophrenia for many years. The illness sometimes gets better for long periods of time. Other worries can make the schizophrenia worse.

This boy needs to see a psychiatric nurse or doctor. He may need treatment with an antipsychotic medicine. Antipsychotic medicines reduce hallucinations, delusions and abnormal thoughts. Haloperidol, chlorpromazine, thioridazine, trifluoperazine and fluphenazine are examples of antipsychotic medicines. These medicines can cause side effects.

One side effect of antipsychotic medicines is acute dystonia. The symptoms of acute dystonia are:

- the patient is suddenly unable to turn his neck away from one side
- the patient is unable to look ahead with his eyes
- the patient is unable to open his mouth.

If you think that a patient has acute dystonia, stop the medicine or reduce the dose. Next, give trihexyphenidyl (benzhexol) 2.5 mg (half a tablet) three times a day until the symptoms have stopped. Treatment for 3 days is usually enough. Send the patient to see a psychiatric doctor or nurse, who may give the patient a different medicine.

DEMONSTRATION 3: Mania

Ask one student to play the policeman and one to play the woman. A policeman has been called to the market place. A woman is annoying the sellers at the market. She is talking quickly in a loud voice. She is wearing bright and mismatched clothes.

Woman: I tell you all. I am God's messenger. God has brought me back from the dead to set you free from your difficult lives. Come with me now and I will show you all the promised land. I will help you all.

Policeman: *Come with me, madam.*

Woman: Ah officer, I'm glad you came. I've been telling these good people how I can help them. Take me to the radio station so that I can talk to more people. I have a very important job to do. God himself has told me what to do.

Policeman: *So you are a priest of the church?*

Woman: Officer, I am the woman who will do God's work on earth. I need no help from the church. I will make the earth a perfect place to live in. All people will soon be as happy as I am.

Ask your students to tell you which of the symptoms of severe mental illness this woman has.

Look for the following answer:

Answer: This woman is having delusions. Her thoughts are unusual.

Ask your students what could be the cause of this woman's illness. Explain what is wrong with her.

This woman does not drink alcohol. She has not been hit on the head and does not have a fever. The woman is ill with a problem called mania.

Tell the students the signs of mania and what to do for a patient with mania.

Patients with mania may:

- be very happy for a long time
- eat a lot and speak quickly
- want to have sex often
- spend all of their money
- think that they are very important
- have hallucinations.

Many patients who have mania some of the time, have depression at other times. This is known as bipolar disorder or manic depressive disorder.

Send this woman to see a psychiatric doctor or nurse, who may prescribe an antipsychotic medicine. After the psychosis has settled mood stabilising medicines such as carbamazepine may be used to prevent low mood and high moods.

Talking to people with emotional health problems

As you become more experienced as a clinician you will realise that emotional health problems are extremely common. You have just learned the most important 4 questions that you can use so that you don't miss severe mental illness. However, emotional health is complex. As you learn more it will be worth asking different questions. And those 4 important questions might only be needed when you are suspicious that a patient might have a severe mental illness. Here are 6 golden questions that may give you a better idea of what is causing a patient's emotional distress:

1. How is your sleep?
2. Have you lost interest in the things you normally enjoy?
3. Do you feel sad?
4. Do you feel scared or frightened?
5. Are you worried about your alcohol or drug use?
6. Do you spend too much time on alcohol or drugs?

These questions, and an ability to listen, will often allow people to share their hidden emotional stories with you. As we mentioned in chapter 3 (how to take a patient's history) you should ask your patient what they want to talk about. And then you should check if there is anything else that they would like to talk about. It is not until you have given the patient a chance to tell you what they want to talk about that both of you can prioritise what might be the most important, or urgent, problem to deal with today. And you can offer them a chance to talk about the other issues on another occasion. Most doctors and psychiatric nurses will ask patients what they think may have caused their symptoms and problems. This is particularly important when you are discussing emotional health. When a patient trusts you they may be comfortable to talk about traumatic events that are still affecting them emotionally, such as violence, rape, bullying or abuse. Trust is very important in helping patients to get better, especially if you are likely to be caring for local patients for months or years. When people have severe mental illness their behaviour can make other local people angry or scared. It is almost never appropriate to chain a person with severe mental illness up. With patience and trust almost all people with severe mental illness will agree to have treatments that will make them feel calmer and sleep better. Some countries even have laws that ensure that people who have severe mental illness can't opt out of receiving treatment in hospital.

Depression and anxiety

Many things that happen in life can cause anxiety and depression. For example, getting married, taking exams or a serious illness in the family, can make people anxious. People who are anxious for a long time may become ill with depression. Depression can also be caused by a big life event or a problem that continues for a long time. For example, the death of a husband or wife or child can make someone ill with depression. Efavirenz, a medicine for HIV can cause depression. Ask the HIV clinic to review their medication.

Ask your students what might cause a patient to be anxious or to become ill with depression.

Demonstrations Tell the students that they will see two demonstrations about patients with symptoms of depression and anxiety.

DEMONSTRATION 4: Depression

Ask one student to play the role of a 35-year-old woman, and one to play the role of a traditional healer.

A 35-year-old woman is talking to the traditional healer. Her husband and her son have died in the last 2 months.

Traditional healer: Tell me what you would like to talk about today.
Woman: *I feel very sad. I cannot sleep and I cry all the time.*
Traditional healer: I heard about the deaths of your husband and son. I am sorry. Are you able to eat?
Woman: *No.*
Traditional healer: What time do you wake up in the morning?
Woman: *Four o' clock. long before the sun comes up.*
Traditional healer: Are you able to do your work? Do you do the things that you normally enjoy?
Woman: *No. I have no interest in anything.*
Traditional healer: Have you thought about harming yourself?
Woman: *Yes. but I could not do it. I still have four children to look after.*
Traditional healer: I can help you get better. You must come to talk to me about how you are feeling every week. It is normal for people to feel sad some of the time and happy at other times. Talking to a friend or relative about their problems can help most people who are sad. If a person is very sad for longer than 2 weeks and also has three other symptoms. she has depression.

Tell the students again that *all* patients who have depression are very sad for 2 weeks or more.

Extra symptoms of depression

Ask your students what the additional symptoms of depression are.

POSTER 4:
(Student answer
poster)

The patient: is **not interested in eating;**
wakes very early. Well before sunrise;
is **more sad in the morning** than in the evening;

has **no interest** in sexual intercourse or other things that they normally enjoy;

is **unable** to do their **work;**

thinks that **they are no good** or feels bad for doing something wrong, although they have not done anything wrong;
or **hopes to die** or **plans to kill themselves.**

Send a patient to see a psychiatric doctor or nurse if they are very sad and also have three or more of these extra symptoms or they are planning to kill herself. The psychiatric doctor or nurse may treat depression with counselling or with antidepressant tablets.

Anxiety

Anxiety can cause different symptoms. The symptoms of anxiety include:

- being aware of your heartbeat
- headache
- sweats
- fast breathing
- tingling in the lips and fingers.

But other illnesses can also cause these symptoms. You should look first for fever or anaemia and for symptoms of severe mental illness or depression. If the patient has none of these problems, they probably have anxiety.

If you think a patient has anxiety, ask them what their problems are. Help them to think about their problems and how to solve them themselves. Tell the patient that their symptoms are caused by anxiety. Help *the patient* to decide what *they* can do to reduce their problems. This is called problem solving therapy or counselling. Suggest that the patient talks about their problem with family or friends to reduce anxiety.

Diazepam should not normally be used to treat anxiety. Diazepam can sometimes cause the anxiety to become a long term problem.

DEMONSTRATION 5: Anxiety

Ask one student to play the role of a 17-year-old woman and one to play the role of a doctor.

The woman is talking to the doctor. She is sitting on the edge of her chair. She is looking down and playing with her fingers.

Doctor: Good morning.
Woman: *Good morning.*
Doctor: How can I help you?
Woman: *I have a headache and I can feel my heart beat.*
Doctor: Anything else?
Woman: *I feel like I'm going to vomit.*
Doctor: Do you have a fever?
Woman: *No.*
Doctor: Do you have a cough?
Woman: *No.*
Doctor: Have you vomited or do you have diarrhoea?
Woman: *No.*
Doctor: What medicine have you used?
Woman: *Just paracetamol.*

Tell your students: The doctor examines the patient. He finds that she is not anaemic and that she does not have a fever. The woman's blood pressure is 110/65.

Doctor: Headaches, feeling your heart beat and feeling as if you are going to vomit are often caused by worry. Is there anything that is worrying you?
Woman: ... (slowly) ... *Well ... yes, there is. I was married last month . I did not want to get married.*
Doctor: I'm sorry. Are you unhappy all the time?
Woman: *No, I still enjoy meeting my friends.*
Doctor: Are you sleeping well?
Woman: *Not bad. It takes a long time to get off to sleep. I do not wake up until sunrise.*
Doctor: Are you able to eat?
Woman: *Yes.*
Doctor: From talking to you and examining you, I can tell you that you do not have any bad illness. Worry or anxiety is almost certainly the cause of your symptoms. Would you be able to talk to someone else about your worries? It may help to talk to a friend who was also married but did not want to marry. If you are not feeling better in 4 weeks, please come to see me again.

How to identify emotional health problems

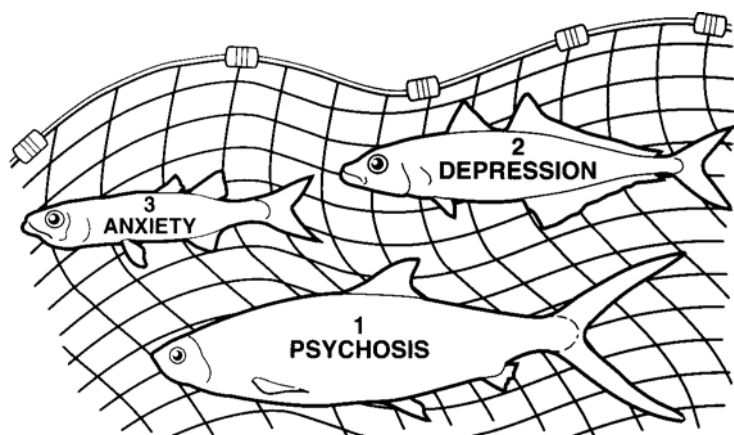
Explain to the students that the next story will help them to remember to look for symptoms of severe mental illness in patients who have symptoms of depression or anxiety. It will also help them to remember to look for symptoms of depression in patients who have symptoms of anxiety.

POSTER 5:
(Prepared poster)

Treat the most important emotional health problem first

Draw Picture 30 (see p. 156) on Poster 5.

Tell the students about the picture:



PICTURE 30 *Treat the most important psychiatric problem first*

A fisherman catches three fish to sell at the market in a town 10 km away. The fisherman can only carry one fish on his bicycle. He must choose which fish to take to town. He will be paid the best price for the biggest fish, so he takes the biggest fish with him to sell at the market. He leaves the small and the medium-sized fish.

A health worker must do the same thing as the fisherman if a patient has more than one psychiatric problem. Treat the biggest problem first, before treating medium-sized or small problems. If a patient has severe mental illness, depression and anxiety, treat the severe mental illness first. Severe mental illness is the patient's biggest problem. Depression is a medium-sized problem. Anxiety is the smallest problem. Remember that delirium (a problem of the body) is more important than psychosis and can cause hallucinations.

Please read appendix 41 Emotional or mental health symptoms. Again, this reminds us that delirium is the biggest problem. Then psychosis. Then depression. Then anxiety. Smaller problems are common with bigger problems. It is really important to check for bigger emotional health problems before deciding which problem to treat. In particular think about alcohol intoxication or withdrawal, fever, glucose levels and dementia symptoms.

Other symptoms that tell you a patient may have a emotional health problem are:

- physical symptoms with no obvious cause
- being tired all the time.

Physical symptoms with no obvious cause

Some patients come to the health centre again and again with physical symptoms that have no obvious cause. Sometimes the real problem is linked to poor sleep or emotional ill health. Ask the patient if there is anything which might be making her worried or sad. Tell the patient that her symptoms may be linked to worry or sadness, but that the symptoms are real. These are called functional symptoms. Some clinicians call these symptoms "somatic symptoms". Where there are no worrying symptoms, it is usually best to stop investigating and to stop asking for more opinions. Experienced clinicians can help these patients to understand functional symptoms and to accept them. This can reduce their anxiety.

In some countries there are no words for sadness, low mood, stress and anxiety. For example in Uganda, people may say that they have a pain in the head or the heart when they are talking about

sadness and stress. Traditional healers often understand that physical symptoms are caused by emotions, and perhaps are better than clinicians at knowing this. But traditional healers may miss serious illness because they do not know about the link between illnesses of the body (delirium) and emotional health symptoms.

Tired all the time Feeling tired all the time is very common in patients with emotional health illnesses. If a patient tells you that they have been tired for a long time, they may have anaemia, diabetes or an infection. But if there is no obvious physical cause for his tiredness, look for an emotional health problem. Also look for a sleep problem. Please see the sleep questionnaire in appendix 38. This will help to identify the cause of the sleep problem. Also see the sleep hygiene leaflet in appendix 39.

Refreshment break

Epilepsy

Epilepsy is usually caused by damage to part of the brain. It is not an emotional health illness. However, many people *wrongly* think that people with epilepsy have a mental illness or that epilepsy is caused by evil spirits.

Patients with epilepsy have convulsions (also called fits). Convulsions can be caused by many other illnesses, such as very severe febrile diseases.

If a patient has had a convulsion:

- Treat them for a very severe febrile disease (see Chapter 2). If you know that they have epilepsy, treat them for a very severe febrile disease *only* if they have more convulsions than usual *and* a fever. Send patients with a head injury to hospital if they have a convulsion.
- If there is no other illness that could have caused the convulsion, the patient may have epilepsy.

However, epilepsy is difficult to diagnose. If you think a patient may have epilepsy, you should send the patient to hospital for diagnosis.

Doctors often only treat epilepsy patients with medicine if they have more than one convulsion every 2 months because epilepsy medicines can cause side effects. For example tiredness.

The medicines prevents convulsions. Common medicines for epilepsy are carbamazepine, phenobarbital or phenytoin.

If a patient is taking epilepsy medicine, you need to:

- Explain to the patient and his family that epilepsy is caused by damage to the brain. This is especially important in cultures where people wrongly think that epilepsy is caused by evil spirits.
- Make sure the patient knows they must take the medicine every day. Tell the patient to get more medicine before the tablets finish.
- Tell the patient not to drive a car, lorry or motorcycle unless they have not had a convulsion for more than 3 years. If the patient has no warning before a fit or seizure they should not handle fire or boiling water.
- In many countries pork tapeworm cysts (in the brain) are a common cause of epilepsy, (neurocysticercosis). If a patient has epilepsy and lives near pigs (or eats undercooked pork) they should not take albendazole, or praziquantel without having a head scan first. These medicines kill the parasites but the dead parasites are more dangerous to the brain and need careful treatment (often with steroids).

**In areas with
sleeping
sickness**

Tell your students:
Sleeping sickness is passed to people by the bite of some types of tsetse fly. Soon after the painful bite, the patient usually develops a painless area at the bite site called a chancre. Then they have an illness that is very similar to malaria. Later the brain becomes damaged. The most common symptom of this is sleeping during the day and not sleeping at night. The patient may develop severe mental illness and strange behaviour. The patient may find it difficult to walk. Patients with sleeping sickness will die without treatment. Send patients to hospital. Treatment is difficult.



Chancre of African trypanosomiasis on black skin



Chancre of African trypanosomiasis on white skin

SECTION 3: When to refer patients to hospital or to a psychiatric nurse or doctor

Illnesses of the body may cause some emotional health symptoms and need immediate treatment and referral to hospital.

When to refer patients to hospital

Write the *headings and the left column only* of Table 1 on Poster 6 before the lesson.

Ask the students which patients with emotional health symptoms, or epilepsy, need immediate hospital treatment. Ask what treatment they will give first.

POSTER 6: <i>(Student answer poster)</i>	TABLE 1 When to refer patients to hospital	
	Symptoms	Treatment and referral
	Hallucinations or delusions or disorganised thoughts	If the patient has a fever, treat for a very severe febrile disease and send to hospital immediately If he has been hit on the head, send to hospital immediately.
	Alcohol withdrawal (Very anxious, shaky or convulsion)	Give 10-20 mg diazepam and 50 ml of milk or sugar water . Send to hospital.
	Epilepsy	If the patient with epilepsy has a convulsion for more than 20 minutes, or has more convulsions then normal and has a fever, or has a general danger sign , treat for very severe febrile disease and send to hospital immediately. If a patient with epilepsy as a convulsion after a head injury , send to hospital immediately.
	In areas with sleeping sickness: Sleeping during the day	If a patient sleeps during the day, but not at night, and behaves strangely or has difficulty walking , send to hospital immediately.
	Unconscious and smells of alcohol	Alcohol intoxication sometimes presents with the patient completely unresponsive - "dead drunk". They can improve with an intravenous glucose (dextrose) infusion. They will also need thiamine.

POSTER 7:

(Student answer poster)

When to refer patients to a psychiatric nurse or doctor

Write the *headings and the left column only* of Table 2 on Poster 7 before the lesson. Ask the students to tell you which patients they would send to a psychiatric nurse or doctor.

TABLE 2 When to refer patients to a psychiatric nurse or doctor

Symptom	Treatment and referral
Acute dystonia	If you think that the patient has acute dystonia, treat with trihexyphenidyl (benzhexol). Send them to a psychiatric doctor or nurse immediately if you do not have any trihexyphenidyl (benzhexol).
Depression	If a patient has at least three of the extra symptoms of depression , or is planning to kill herself , send them to a psychiatric doctor or nurse immediately.
Severe mental illness	If a patient has symptoms of severe mental illness but has no fever and has not been hit on the head , sent them to see a psychiatric doctor or nurse immediately.

Section 4: Practical: traditional healing

Ask a traditional healer to teach your students about his, or her, methods of treating anxiety and depression. Let him, or her, decide with you how to teach this section. Ask him or her to teach for about 30 minutes.

Traditional healers sometimes have false ideas about what causes epilepsy or psychosis. Tell your patients that epilepsy and psychosis are not caused by evil spirits and need modern medical treatment.

Section 5: Post-natal depression

It is common for new mothers to feel stressed or low in mood. Sometimes new mothers can become emotionally severely unwell. It is important for someone to ask new mothers how they are feeling. And if there is any suggestion that things are emotionally difficult for them it is worth asking them about dark thoughts. You could ask, for example: "Sometimes when you are feeling low it can be common to think about harming or even killing your baby, or yourself. Is that something that has affected you?" Post natal depression affects 10% of mothers in some countries.

Post-natal psychosis is less common but affects 0.1% of mothers. Psychiatric nurses and doctors will help with a combination of talking therapy, promoting attachment between mother and baby and medications. Antipsychotic medication may often be in the form of intramuscular injections.

Section 6: Suicide

When people are depressed, sad, stressed, anxious, or using substances, there is a small chance that they might kill themselves. You will not cause any harm by asking a question like: "Have you had any dark thoughts about not wanting to be alive?" This is much more sensitive than talking about "committing suicide". The word commit is often inappropriate and insensitive.

You should usually ask a sensitive question like this when you discover any of these emotional health problems. Important changes in peoples' lives can make them feel vulnerable. Patient's need to know that it is common for other people to feel vulnerable at times, but that suicidal thoughts or feelings do not usually last long. Practical support and treatments for emotional health illnesses will make a big difference to them. Even just talking to someone that they trust, on a regular basis, will usually make them feel better.

Section 7: Substance misuse and addiction

Unfortunately using substances tends to make peoples' emotional health worse. One of the most commonly used substances is alcohol. Alcohol tends to depress the mood, interfere with a healthy sleep pattern and make people feel more anxious. However many people can use alcohol safely.

Many substances will affect a person's relationships with their family and friends. To give you an idea of the emotional health problems that substances and addiction can cause, here is a list of substances. Until you have discussed the problems that each substance causes we suggest that you cover the problems on the right side of this table.

Students should tell you what emotional health problems that each substance causes. Addiction is discussed in chapter 6. It is common for people to be addicted to alcohol or opioids.

POSTER 8:

(Student answer poster)

Substance	Emotional health problem
Alcohol	<ul style="list-style-type: none"> • Antisocial behaviour, violence and partner abuse. • Worsens anxiety, sleep and depression. • Wernicke’s encephalopathy, with very heavy drinking, causing incoordination or eye movement problems. This is treated in hospital with thiamine. When harmful drinking is linked with a poor diet the patient should be given thiamine 100 mg daily to protect their brain. • Hallucinations, confusion or convulsions can occur with rapid withdrawal if alcohol is stopped too quickly. Anxiety symptoms are also common. <p><i>If someone drinks in a harmful way and you think they may be at risk of withdrawal symptoms (for example they have previously had the symptoms above): they should halve their alcohol intake each week until they are drinking safely.</i></p>
Cannabis	<ul style="list-style-type: none"> • Increased chance of psychosis. • Commonly there is lack of motivation.
Opioids	<p><i>These medicines are used for short term pain but don’t work for long term pain.</i></p> <p><i>Opioids make the pupils (in your eyes) small, and can even stop your breathing if taken in overdose.</i></p> <p><i>Opioids can be physically addictive.</i></p> <p>When injected opioids are particularly dangerous and are linked to a high risk of HIV, hepatitis B and hepatitis C transmission. Using sterile needles reduces this risk.</p> <ul style="list-style-type: none"> • Opioid use is linked with anxiety and depression and other emotional health problems.
Cocaine and other stimulants	<ul style="list-style-type: none"> • Aggression or over-confidence. • Erratic behaviour.
Steroids	<p><i>Steroids are misused by some to make their muscles look bigger. Unfortunately steroids do not make the muscles strong and they can also cause a lot of physical problems when misused.</i></p> <ul style="list-style-type: none"> • Steroids can cause anxiety, low mood, paranoia and psychosis. • Anger is a common problem.

Section 8: Medications for emotional health problems and epilepsy

Choosing the appropriate way to improve emotional health problems is difficult and requires special training. This training course does not aim to teach you all of these skills. However, it is useful for you to know some of the medicines that are used to treat emotional health problems and epilepsy, and some of the unwanted symptoms that can be caused by taking these medicines. You may need to reduce the dose of some of these medications if the medicine is causing unwanted symptoms, or if the medicine is no longer needed. Emotional health problems are often treated with support from health workers and with talking therapy. You should also involve the patient in decisions about treatment whenever possible.

People with other long-term health problems are more likely to have emotional health problems. Their other long-term health problems can also affect the type of treatment that is suitable for them. For example, people living with HIV are often treated with sodium valproate to stabilise their mood if they have manic depressive disorder. But Sodium valproate is not suitable for women preparing for pregnancy. As mentioned earlier: choosing the best treatment for emotional health problems needs special training. Poorly managed emotional health will make the other health problems worse. People who have poor emotional health are often not good at taking important regular medication like antiretroviral therapy (ART) for HIV. Missing medication is very dangerous for them.

Medicine	Uses	Dose	Unwanted symptoms
Amitriptyline tab 10 mg; 25 mg, 50 mg Amitriptyline is dangerous in overdose and it is important to assess the risk of suicide. Consider a carer looking after the medication.	Nerve (neuropathic) pain (for example after shingles) especially if it is affecting sleep. Anxiety or depression	5-25 mg at night 25 mg to 150 mg at night	Drowsiness (take before sleep) Dry mouth (start with a low dose and slowly increase). Low doses will help anxiety and sleep.
Baclofen tab 10 mg	For alcohol addiction if the patient wants to stop drinking, or cut back to safer alcohol consumption	10-30 mg at night or 10 mg x3 per day	Drowsiness (usually best to take before sleep)
Carbamazepine tab 100 mg, 200 mg, 400 mg	Mood stabiliser Epilepsy Increase doses slowly each week to the dose needed. Reduce dose if unwanted symptoms (drowsy or lack of coordination).	100-600 mg per day in 1 dose (For epilepsy: child 1 month to 11 years: 5-20 mg/kg x1/day; 12 years and above 100-1200 mg x1/day)	Drowsiness (take before sleep) confusion, dizziness, itching, double vision, nausea, diarrhoea. Rarely: severe rash or Stevens-Johnson syndrome.

Medicine	Uses	Dose	Unwanted symptoms								
<p>Diazepam. Rectal solution. 5 mg or 10mg in a rectal tube.</p> <p>Sometimes by injection 10 mg/ 2 ml in vial</p> <p>Oral tablets 2 mg (sometimes 5 mg)</p>	<p>When the patient is having a convulsion.</p> <p>Also used for severe alcohol withdrawal symptoms - hallucinations, convulsion</p> <p>Occasionally used for severe anxiety in the short term but because it is habit forming (addictive) it is not used for longer than a few days.</p>	<table border="0"> <tr> <td>Age</td> <td>Dose</td> </tr> <tr> <td>Less than 1 year</td> <td>2.5 mg</td> </tr> <tr> <td>1-3 years</td> <td>5 mg</td> </tr> <tr> <td>4 years or more</td> <td>10 mg</td> </tr> </table> <p>Give one more dose if still convulsing 5 minutes after the first dose.</p>	Age	Dose	Less than 1 year	2.5 mg	1-3 years	5 mg	4 years or more	10 mg	<p>Drowsiness</p>
Age	Dose										
Less than 1 year	2.5 mg										
1-3 years	5 mg										
4 years or more	10 mg										
<p>Fluoxetine cap 20 mg</p>	<p>Major depression</p> <p>Generalised anxiety disorder</p> <p>Severe post-traumatic stress disorder</p>	<p>20 mg x/1 day (usually in the morning) for most problems</p>	<p>Rarely: bleeding from the stomach or intestine. Avoid regular use of aspirin, ibuprofen or other non steroidal anti-inflammatory medicines.</p> <p>Rarely: Worse anxiety and even suicidal thoughts.</p>								
<p>Fluphenazine Long acting injection 12.5 mg in vial Intramuscular (in the thigh)</p>	<p>Psychosis: to reduce hallucinations, delusions and severe anxiety</p>	<p>12.5 - 25 mg every 2 to 4 weeks</p>	<p>Drowsiness</p> <p>Occasionally dystonia</p> <p>Weight gain, inactivity and increased chance of heart attack and stroke.</p> <p>Consider lower doses (eg 6.25 mg) as improves or if has dystonia</p>								
<p>Haloperidol tab 0.5 mg</p>	<p>Psychosis: to reduce hallucinations, delusions and severe anxiety</p>	<p>0.25 mg to 3 mg each day (sometimes higher doses) until symptoms settle</p>	<p>Drowsiness (take before sleep)</p> <p>Occasionally dystonia</p> <p>Weight gain, inactivity and increased chance of heart attack and stroke. Consider reducing the dose or stopping if it is no longer needed</p>								

Medicine	Uses	Dose	Unwanted symptoms
Levetiracetam tab 250 mg or 500 mg	Epilepsy	250-500 mg x2/day Sometimes higher. Lower doses for children under 50 kg	Common: drowsiness, headache, nose and throat symptoms. Less common: Anxiety, poor sleep, reduced appetite.
Sodium valproate tab 100 mg, 200 mg, 300 mg or 500 mg	Mood stabiliser for bipolar disease (manic depressive disorder) Epilepsy	500-1000 mg x1 per day Preferred medication to use with ART	Common: drowsiness, headache, tremor, ataxia, nausea, vomiting, diarrhoea, weight gain, temporary hair loss, confusion.
Trihexphenidyl (Benzhexol) tab 2 mg or 5 mg	To treat dystonia (a reaction to medicine in which muscles in the neck, around the eyes, or jaw go into spasm)	2 mg (or 2.5 mg) x3/day until the symptoms have stopped. Treatment for 3 days is usually enough. Send the patient to see a psychiatric doctor or nurse, who may give the patient a different medicine	Common: drowsiness, confusion and memory disturbance (especially in older adults), fast pulse, dry mouth, difficulty passing urine and constipation.

Section 9: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. A patient is brought to you because they have been doing strange things for the past 5 days. What questions should you ask to find out if they have severe mental illness?

- When you are on your own, do you hear people's voices? Do you often see things that are unusual?
- Do you have any ideas that other people know are not true that you know are true?
- Have you been sad for more than 2 weeks?

Where should you send them if you think they have a severe mental illness?

- If there is no fever and no head injury, send them to see a psychiatric doctor or nurse.
- If there is fever, treat for a very severe febrile disease and send them to hospital immediately.
- If they have had a head injury, send them to hospital immediately.

2. What are the important symptoms of depression?

- Being very sad for at least 2 weeks
- No interest in eating
- Waking very early, well before sunrise
- Being more sad in the morning than in the evening
- Having no interest in sexual intercourse or other things that they normally enjoy
- Being unable to concentrate or to do their work
- Feeling no good or feeling bad for doing something wrong when they have not done anything wrong
- Hoping to die or planning to kill themselves

3. What advice should you give to a patient who has epilepsy?

- Epilepsy is caused by damage in part of the brain.
- Epilepsy is not caused by evil spirits.
- Do not drive for 3 years after a convulsion.
- Take your epilepsy medicine every day and get more tablets before the tablets finish.

Lesson 12 Tuberculosis (TB)

BEFORE THE LESSON

- Arrange for all the students to visit a TB clinic. It is sometime best if all students visit the clinics before you teach this lesson. Ask the TB doctors at the clinics to show the students each of the symptoms in the Table 2 in section 3.
- Some areas do not have TB clinics. Consider using WhatsApp to allow students to see and talk to patients with TB.
- Give each student a copy of List 1 'When to refer TB patients to hospital' before they visit the clinic. They should take List 1 with them when they visit the clinics.
- There are 6 posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared posters 1, 3, 5
Student answer posters: 2, 4, 6
- Listen to this podcast about Tuberculosis created by Professor Bob Mills: <https://podcasters.spotify.com/pod/show/the-virtual-doctors/episodes/Tuberculosis-e2c69p0>

Lesson plan

1 Quiz

2 Diagnosis and management of tuberculosis

3 When to send patients to hospital

4 TB in children

5 Practical: visits to a TB clinic

6 Answers to the quiz

SECTION 1: Quiz

POSTER 1: (Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. Name three important symptoms of tuberculosis (TB).
2. What investigations can be done to help decide if a patient has TB?
3. What can make a patient more likely to have symptoms of TB?
4. Which TB treatment is most likely to cause jaundice?
5. Which other TB treatments can cause jaundice?
6. Which TB treatment will stop the combined oral contraceptive pill from working and is also most likely to stop HIV drugs from working?
7. How soon after starting treatment will the patient stop being infectious?

SECTION 2: Diagnosis and management of Tuberculosis

POSTER 2: (Student answer poster)

Divide Poster 2 into four areas. Label the four areas: Area 1: What is TB and who gets TB? Area 2: What symptoms does TB cause? Area 3: How is TB diagnosed in the clinic? and Area 4: TB treatment. In each of the four areas, write an example of a key word, for example:

Area 1: What is TB and who gets TB?

eg mycobacteria

Area 2: What symptoms does TB cause?

eg cough for more than 3 weeks

Area 3: How is TB diagnosed in the clinic?

eg sputum GeneXpert test

Area 4: TB treatment

eg treatment usually takes 6 months

Area 3: How TB is diagnosed in the clinic - tests for TB

- **Sputum GeneXpert** and GeneXpert Ultra tests. These tests detect TB DNA. The GeneXpert tests can also be used on fluid aspirated from a TB abscess, or on a spun-down sample of urine. The GeneXpert tests will also tell you if either Rifampicin or Isoniazid might not work to treat a patient's TB.
- These are often the best tests in low resource settings. GeneXpert tests are less good at picking up pulmonary TB if there is blood in the sputum. Many patients with HIV and TB don't produce sputum. **Sputum smear microscopy** is also worth doing to look for pulmonary TB when there is blood in the sputum. Two stained samples of a patient's sputum (taken at different times on the same day) are examined under the microscope. If the patient has pulmonary TB, sputum smear microscopy may find **acid fast bacilli (AFB)**. TB mycobacteria are acid fast bacilli. Acid fast bacilli are often not found in the sputum of a patient with TB. (Acid fast staining of sputum is done less in resource poor settings these days when GeneXpert tests are available.)
- **Chest X-ray** will show a shadow in the lung if the patient has a large TB abscess. But if the immune system is not working (especially in HIV) TB abscesses are less common.
- **Tuberculin skin testing (or an IGRA blood test)** (usually) **tells you that there is an immune memory of TB. Tuberculin skin testing** is helpful for diagnosing TB in children. This is because children with TB do not usually produce sputum and chest X-rays in children do not always give clear results. Because it is so difficult to diagnose TB in children we have a special guide at the end of this lesson to help you to diagnose TB in children.
- In many countries unfortunately it is not helpful to do a tuberculin skin test on an adult, since it is so common to have an immune memory of TB (which shows latent TB). Latent TB rarely wakes up to cause symptoms and disease (5-10% of people without HIV) .
- In countries where TB is not common, the Tuberculin skin test and the IGRA blood test are useful tests to decide who should be given treatment for latent TB to stop TB from spreading.
- If the CD4 count is less than 100, or in children aged 5 or less, a urinary LAM test can be a very useful to diagnose TB.

Area 4: TB treatment

TB mycobacteria can only be killed when they are multiplying. Because TB mycobacteria multiply very slowly, it takes several months to kill them all. The treatment for TB is different in different countries. Teach your students the treatment and drugs that are recommended by the national policy of your country. The treatment is also different if the patient has been treated for TB before. Medicines used to treat most people with TB are **rifampicin, isoniazid, pyrazinamide, ethambutol**. Usually patients take four different medicines for the first 2 months of treatment. Next, patients take two medicines for a further 4 months. Within 2 weeks of starting treatment patients are no longer infectious.

Many countries now use **Directly Observed Treatment (DOT)** programmes. A reliable person in the community gives the patient the medicine. This person may be a shopkeeper, a village leader or a health worker in the village or at a hospital.

If the GeneXpert test suggests Multi-Drug Resistant (MDR) TB, different drugs will be used and this may be for a different length of time.

Ask each student to write one word or idea about TB in the correct area on Poster 2. Next, ask students to write other words or ideas on Poster 2.

Add any summary words from the information below that the students have missed.

Then, for each area in turn, ask each student to tell the class what he understands about the word he wrote. Draw a circle around each summary word as the student talks about it. Thank each student for his explanation.

Use the following explanations to add useful information and to correct mistakes.

Area 1: What is TB and who gets TB?

Tuberculosis (TB) is an illness that is caused by **mycobacteria**. Mycobacteria are a type of bacteria that multiply very slowly. Mycobacteria sometimes stop growing and hide in the body. This makes illnesses caused by mycobacteria difficult to treat.

TB mycobacteria cause abscesses. **TB abscesses** grow very slowly and are **not hot or red**. TB abscesses normally grow in the lungs. They also grow in lymph nodes, in joints, in bone or even in the brain.

When there are TB abscesses in the lungs, this is called pulmonary TB. When a TB abscess in a lung bursts, pus comes out and may get into the bronchi. Patients with pulmonary TB cough up this pus and spray TB mycobacteria into the air. Other people can **only get infected** with TB **by breathing in TB mycobacteria**. People who spend a lot of time in the same room as a patient with pulmonary TB are most likely to catch TB, especially if air cannot easily pass through the room.

When a person breathes in a large number of TB mycobacteria, the mycobacteria attack their body. If the person is healthy, their immune system (the body's defence system) will kill most of the mycobacteria. But a few of the TB mycobacteria can find a place to hide and go to sleep. The mycobacteria will wake up and attack the body again if the person's **immune system** is damaged or **weakened**. For example, **HIV, malnutrition** and **diabetes**, stop the immune system from fighting off TB. If the TB mycobacteria multiply, the **person will become ill with TB**.

Area 2: What symptoms and signs does TB cause?

Most immunocompetent patients, who are ill with tuberculosis, have pulmonary tuberculosis. Extrapulmonary TB can be TB abscesses in the lymph nodes, joints, bones, abdomen, brain or the area around the heart. One in every five immunocompetent TB patients has extrapulmonary TB.

The most common symptoms and signs of TB are:

1. A **cough** for more than **3 weeks** (this is the most common symptom of pulmonary TB 70-90%) .
2. **Weight loss** with no other illness to cause weight loss (50-75% of TB patients)
3. **Swelling of a lymph node** for more than **2 weeks** (The swelling is not hot and is only mildly tender when touched.)
4. **Coughing up blood** (1 in 3 of those with pulmonary TB do this)
5. **Night sweats** (usually profuse), or mild fever (70% of those with TB), a slightly fast heart rate is common.
6. **TB meningitis** is one illness that can present with a headache, vomiting and a reduction in conscious level.
6. **Constant pain in the back** for more than 6 weeks and **part of the spine is tender**, There may also be neurological damage.
7. **TB septicaemia** (pulse above 130; respiratory rate above 30; a temperature of 39 degrees Celsius or more; or unable to walk unaided) is much more likely in patients who have advanced HIV (with a low CD4 count) or in children under the age of 3. TB meningitis is also much more likely in advanced HIV or in children under the age of 3).

Send a patient who has any of these symptoms to the TB clinic.

*Depending on where the TB abscesses are, TB can cause **heart failure, septic arthritis, pain in the side of the chest, or strange behaviour.** But TB is not the only cause of these problems.*



A TB sign:
A TB lymph node
in the neck

What to tell TB patients

POSTER 3:
(Prepared poster)

- The treatment will take 6 months (sometimes longer than 6 months).
- They cannot infect other people 2 weeks after starting the treatment.
- **If they do not complete the treatment, they will become ill with TB again.** After **incomplete treatment** the TB mycobacteria are **more dangerous** to them and to other people.
- They should **exercise** if they feel well enough.
- **Rifampicin** makes sweat, tears, **urine and semen red or orange** in colour. The semen is healthy and **men may safely father children** when they are taking TB treatment.
- The patient can have sexual intercourse.
- If the white parts of the eyes become yellow, the patient should stop the medicine and go to the TB clinic.
- **Streptomycin** is dangerous to unborn babies. If a woman could become pregnant, she must tell the TB clinic immediately.
- Rifampicin, isoniazid, pyrazinamide and ethambutol are safe in pregnant women.

When TB wakes up

Most (70%) people who breathe TB in do not become ill. Their immune system fights against the mycobacteria and most people get rid of TB without it leaving an activated immune memory of TB.

30% of people who get infected get an immune memory of TB and this can be seen in the IGRA blood test or in the tuberculin skin test. These people have latent TB which can wake up and cause symptoms and disease.

In otherwise healthy people, only 5-10% of people with an immune memory of TB will develop TB symptoms and disease in their lifetimes.

What might cause the TB to wake up?

POSTER 4:
(Student answer poster)

- HIV
- Malnutrition
- Diabetes Mellitus
- Harmful alcohol consumption
- Smoking
- Vitamin D deficiency (Vitamin D is usually produced with sun exposure on the skin.)
- Indoor fires
- Some medications (Long term steroids, TNF alpha blockers - used to treat conditions in which the body has too much inflammation eg rheumatoid arthritis).

Late stage HIV can also cause the IGRA blood test and tuberculin skin tests to become negative even though the patient has active TB disease. These tests are rarely used in areas where TB is common, since they rarely influence treatment.

TB in HIV

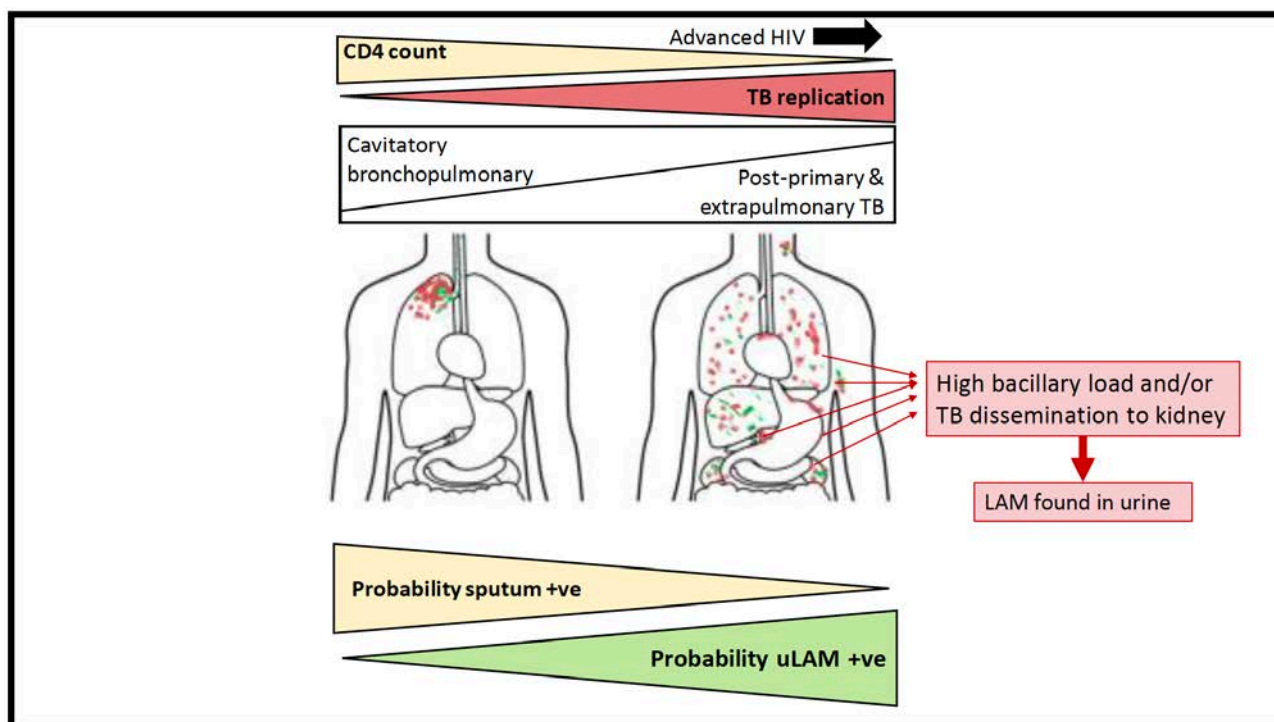
POSTER 5:
(Prepared poster)

- People living with HIV are much more likely to develop TB. Without HIV 5-10% of people with an immune memory of TB will develop symptoms of TB in a lifetime. But if you have HIV that increases massively to a **5-10% chance each year**.
- People with advanced HIV (with a low CD4 count - less than 100 cells/mm³), together with TB, have different symptoms from other patients with TB. TB is the most common infection made more common by HIV. If the CD4 count is low: it is much more likely that the TB will be **extrapulmonary (50%)**. So the **chest Xray** is **less** likely to be **helpful** and sputum will be hard to get. The immune system fighting with reactivated TB causes cavities in the lungs. If the CD4 count is very low there is **less likely** to be chest X-ray changes, TB **mycobacteria in the sputum** or bloody sputum. Don't trust a normal looking chest Xray, or a negative sputum result for TB, in someone who has HIV and is unwell.
- **Cough, fever, night sweats, and weight loss** are still **common** (80% of TB patients will have one or more of these symptoms). However, these symptoms are also common in other infections made more common by HIV, as well as TB. In fact, even HIV itself can cause a cough and a postnasal drip.
- Without CD4 cells the **TB infection is not kept in granulomas** and can cause **septicaemia**. These patients are often unwell for several weeks before they see a clinician. If the pulse is greater than 120, the breathing rate is greater than 30, or the temperature is greater than 39 degrees Celsius, or if they can't walk unaided, they are classed as having a **danger sign**. These patients need emergency treatment. The initial treatment is usually to treat for possible bacterial infections in the same way that you would treat for a very severe febrile disease.
- Because 50% or more of dangerously ill HIV patients have TB septicaemia, or widespread TB, **test for TB** (see a suggested plan for TB testing). **Consider treatment for TB**, even if all the TB tests are negative if there is no improvement after a day or two.
- **Widespread TB** also often causes a **loss of appetite, abdominal pain and diarrhoea**. These patients also tend to **breathe quickly** (caused by a metabolic acidosis). If you have a pulse oximeter, the readings in TB septicaemia may be normal. (If the patient has Pneumocystis Jirovecii pneumonia - also often seen in HIV (rather than TB) - the oxygen numbers are often low.)

The diagram on the next page summarises that: as the CD4 count comes down with advancing HIV, that TB is more likely to be extrapulmonary. (And less likely to be cavitary or bronchopulmonary.)

The diagram also shows that urinary LAM testing is more likely to be helpful in advanced TB. (And sputum is less likely to be positive on a GeneXpert test.)

**Diagram 1 - Patterns of TB change as HIV becomes more advanced.
Extrapulmonary TB and severe TB become much more likely**



All the normal tests for diagnosing TB are less likely to work if a patient also has HIV, so it is worth considering other ways of testing for TB:

- GeneXpert and GeneXpert Ultra are worth using on spun down urine (10 minutes in a centrifuge) samples, or lymph node aspirate samples, in preference to sputum, since sputum production is poor if the CD4 count is low. (Sputum is also worth examining with GeneXpert tests if other tests are negative.)
- Urine lipoarabinomannan antigen lateral flow test, **LAM test** for short, is much better at picking up TB if the CD4 count is low (less than 100 cells/ μ l) - **56% sensitive**.

Table 1 - How to test various samples for TB, depending on what symptoms or signs are present

A suggested plan for TB testing:		
For any patient with a cool abscess	(NOT for staphylococcal abscesses which are hot and very tender.) Use a wide-bore needle and aspirate the pus. Wash out the syringe with saline for small amounts of pus and spin down the saline using a centrifuge for 10 minutes. Then put the pellet into the buffer of a GeneXpert test. If you have enough pus there is no need to use saline or a centrifuge. Put the pus into the buffer of the GeneXpert test.	
If a patient has symptoms of TB, eg cough, fever, night sweats or weight loss	For HIV negative adults, or for HIV positive adults with a CD4 count of above 100 cells/mm^3	For patients with HIV with a low CD4 count (below 100 cells/mm^3)
	GeneXpert test on sputum	Spin down urine in a centrifuge for 10 minutes and then put the pellet into the buffer of a GeneXpert test.
	If the GeneXpert test on sputum is negative: - do a Chest X-ray.	If the GeneXpert test is negative then test another urine sample with the LAM test. If other tests are negative for TB: - do a GeneXpert test on sputum.

Isoniazid Preventative Treatment (IPT)

Because HIV makes TB much more common: If there are no symptoms of tuberculosis at diagnosis of HIV (or after TB treatment has finished) patients are given **Isoniazid preventative treatment (IPT)**. This consists of Isoniazid 300 mg daily with pyridoxine 25 mg daily. It is usually given for at least 6 months, and often for life. Co-trimoxazole and IPT are usually started at the same time as ART. A fixed-dose combination of co-trimoxazole 960 mg/Isoniazid 300 mg/Pyridoxine 25 mg is increasingly available in low-resource settings.

Paradoxical reactions during TB treatment and ART (treatment for HIV)

The same medications are used to treat TB in HIV but since patients with HIV are using Anti-retroviral treatment (ART) to treat HIV, they can get IRIS reactions and drug interactions. You will learn more about these in the HIV lesson.

IRIS (Immune Reconstitution Inflammatory Syndrome) reactions usually happen in the first 3 months after starting treatment for HIV (mostly in 2-4 weeks), especially if the CD4 count is low. Patients with known TB, and unknown TB, can have IRIS reactions when HIV patients start ART. These happen because it is the immune system, fighting TB organisms, that causes TB symptoms.

IRIS reactions might be cool abscesses in lymph nodes, joints, bones, the abdomen, the brain or in the area around the heart. Sometimes the liver enlarges.

25% of people who have non pulmonary TB will have an apparent worsening of their TB symptoms (eg bigger and more inflamed lymph nodes).

You should continue with the TB treatment and use non-steroidal anti-inflammatory tablets (eg naproxen or ibuprofen). Occasionally it may be necessary to use steroids.

If a patient has possible TB meningitis with HIV it is important to treat the TB for at least 4 weeks before starting ART. They should also be given a preventative dose of steroids for a month.

Side effects of TB medicines

TB medicines can cause side effects. Most of these side effects are mild and should not stop patients from taking the medicine. However, sometimes TB medicines can make patients very ill:

- If a patient becomes jaundiced, send the patient to the TB clinic. They may change the TB medicines. The patient should not use the pyrazinamide again until they have seen a TB clinician. Pyrazinamide is the most likely TB medicine to cause jaundice.

Rifampicin Rifampicin affects the enzymes in the liver. This means that many medicines may not work so well. The combined oral contraceptive is not effective with rifampicin. Many ARTs are affected by rifampicin - www.hiv-druginteractions.org/checker

Rifampicin causes orange urine, tears and semen. Commonly it causes diarrhoea or nausea. Sometimes it causes jaundice. Rarely rifampicin causes a rash, bleeding gums or bruising, a flu like illness, blood in the urine and feeling unwell.

Isoniazid When using isoniazid, give pyridoxine 10 mg daily (vitamin B6) to everyone if possible. If it is not possible to treat everyone, then prioritise pregnant women, patients with HIV, people who drink alcohol harmfully (this is more than 35 units in a week), people with malnutrition or with diabetes. Isoniazid commonly causes diarrhoea or nausea. Sometimes isoniazid can cause jaundice. It can also cause problems in the hands and feet - numbness or weakness. Rarely isoniazid can also cause seizures or psychosis, fever and skin rash. Many of these symptoms are caused by pyridoxine deficiency since isoniazid causes excess pyridoxine to be lost in the urine.

Ethambutol Ethambutol can cause loss of colour vision and clarity of vision. Ethambutol in large doses can cause blindness.

Pyrazinamide Often causes diarrhoea or nausea or sore joints. Pyrazinamide is the most likely TB medication to cause jaundice. It rarely triggers gout symptoms.

Extra notes about Rifampicin and ART

Rifampicin is OK with NRTI drugs

Don't use Nevirapine with Rifampicin.

Don't use protease inhibitors with rifampicin.

Dolutegravir needs to be given twice a day rather than once when used with rifampicin.

Don't use Raltegravir with rifampicin but Raltegravir is suitable to use with Isoniazid Preventative Treatment (IPT).

Rifampicin is OK with Efavirenz, but Efavirenz has side-effects that can affect the brain - so avoid Efavirenz if the patient has a history of a severe mental illness, or moderate to severe depression.

Medication issues (draw a table like the one below, ask the students to pencil in the answers)

POSTER 6:
(Student answer poster)

Issue	Rifampicin	Isoniazid	Ethambutol	Pyrazinamide
Affects other medicines (eg combined oral contraceptive and ARVs)	✓			
Diarrhoea or nausea	✓✓	✓✓		✓✓
Jaundice	✓	✓		✓✓
Other issues	Orange urine, tears and semen	Numb or weak hands or feet. Give pyridoxine to risk groups	Loss of colour vision and clarity	Gout rarely
	Rarely rash, bleeding gums or bruising	Rarely seizures or psychosis		

SECTION 3: When to refer patients to hospital

Before the lesson, give each student a copy of Table 2, which explains when to send patients to a clinic or hospital. They should take this table with them when they visit the TB clinic. The students should also take a copy of the suggested plan for TB testing.

LIST 1 When to refer TB patients to hospital

Possible TB PATIENTS

Refer to a TB clinic for diagnosis if:

- cough more than 3 weeks
- weight loss
- lymph node swollen for more than 2 weeks
- coughing up blood
- night sweats
- pain in back for more than 6 weeks and part of the spine feels tender

General danger signs. Treat for a very severe febrile illness and send immediately to hospital:

(Possible TB septicaemia)

- if the pulse is greater than 120
- the breathing rate is greater than 30
- the temperature is greater than 39 degrees Celsius
- if they can't walk unaided

Symptoms of possible TB meningitis (gradual onset over days rather than hours). Send to hospital:

- severe headache with vomiting and / or a reduced level of consciousness. (Read the fever, malaria and convulsions lesson.) TB meningitis may be the cause, especially if the symptoms have been going on for 5 days or more. Treat for a very severe febrile illness, before sending to hospital to test and treat for TB meningitis.

Stop TB medicine and send to the TB clinic if:

- jaundice on TB treatment. Pyrazinamide is the most likely cause.

SECTION 4: TB in children

Tuberculosis in children is often difficult to diagnose. Partly because young children can't cough into a bottle and partly because extrapulmonary TB and pulmonary TB are equally common. **TB in childhood is very dangerous, especially in children under the age of one year.** It happens more commonly if close contacts such as family have TB.

Suspect TB if:

- A child has an unexplained fever, that does not get better with other treatments.
- There is unexplained weight loss.
- There is lymph node enlargement that lasts for more than 4 weeks.
- A child has a cough for more than 4 weeks especially when it does not improve with antibiotics.
- The child (particularly under the age of 1 year) has a persistent headache, poor feeding, vomiting, neck stiffness or if light causes them distress (photophobia). This may be TB meningitis.

We recommend that you arrange a Tuberculin skin test (or an IGRA blood test) for these children, and that you arrange a Chest X-Ray too. TB lymph nodes, or infiltrates may be visible on a Chest X-Ray. Also consider doing GeneXpert testing of lymph node aspirate samples (or even of induced sputum, or gastric aspirate samples.)

The following scoring system may guide you to make a probable diagnosis of TB for children, so that you can decide which children to start on TB treatment.

Because TB is so common in HIV, all patients with HIV are asked if they have any symptoms of TB at diagnosis and then put on Isoniazid Preventative Treatment.

Please don't forget to do an HIV test on children who have any symptoms or signs of TB.

If a child has HIV, a urine LAM test may be useful to look for TB. Recent measles infection, or poor nutrition, can also be triggers for severe TB illness.

Example of a score chart for child with suspected TB*			
		Score	Patient score
Length of illness?	Less than 2 weeks	0	
	2-4 weeks	1	
	More than 4 weeks	2	
Weight centile? (Plot their weight on a WHO centile chart)	80% or more	0	
	60-80%	1	
	Less than 60%	2	
Family or household TB (past or present)?	No family with TB	0	
	TB reported in the family	1	
	Known sputum positive family member	2	
Positive tuberculin skin test (or positive IGRA blood test)?		3	
Large painless lymph nodes - firm, soft, and/or sinus in neck, axilla, and groin?		3	
Unexplained fever, night sweats, no response to malaria treatment?		2	
Malnutrition, not improving after 4 weeks?		3	
Angular deformity of the spine		4	
Unexplained abdominal mass and or fluid in the abdomen		3	
Change in behaviour, seizures, reduced level of consciousness		3	
If the total score is 7 or more - treat for TB		Total	
Treat children with a score of less than 7 for TB if the chest X-ray is characteristic of TB infection and/or the child does not respond to two 7-day courses of two different antibiotics.			

* Adapted from: Dr Keith Edwards, University of Papua New Guinea, published in Crofton J, et al (1997) Clinical tuberculosis, Oxford: MacMillan. Also known as the modified Crofton Score.

The BCG vaccination is given to children immediately after birth, often within a day or two. But BCG is not given to babies exposed to HIV, unless the mother's viral load is zero. The BCG vaccine reduces the chance of a child getting severe TB, TB meningitis and miliary TB. Babies exposed to HIV should not receive the BCG vaccine until after they test negative for HIV at 6 weeks.

Children with TB will probably have caught the TB from an adult in the household with a long term cough or known TB. All adults with a cough should be tested for TB and other children may need to be tested or to be given preventative treatment.

Diagram 2 - The symptoms, signs and investigation findings are different depending on the age of a child with TB

	5	10	15	20	25	30	35
Age 0-3							
Miliary TB, TB meningitis							
	Age 2-13						
Lymph nodes on the Chest X-ray (hilar)							
		Age 12-28					
		Pulmonary TB with cavities or pleural effusion					
					Age 26+		
				Pulmonary and extrapulmonary TB			

SECTION 5: Practical: Visits to a TB clinic

Each student should visit a TB clinic during the course.

SECTION 6: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

- Name three important symptoms of TB.
 - A cough for more than 3 weeks
 - Weight loss
 - Swelling of a lymph node for more than 2 weeks
 - Coughing up blood
 - A constant pain in the back for more than 6 weeks and part of the spine is tender
 - Severe headache, vomiting and reduction of level of consciousness
- What investigations can be done in the clinic to diagnose TB?
 - Gene Xpert test and Gene Xpert Ultra test.
 - Urine LAM test (Lipoarabinomannan)
 - Sputum smear microscopy (or culture)
 - Chest X-ray
 - Tuberculin skin testing IGRA blood testing show a memory of a TB infection.
- What can make a patient more likely to have symptoms of TB?
 - HIV and other illnesses that affect the immune system (malnutrition, diabetes mellitus, harmful alcohol consumption, smoking, vitamin D deficiency).
 - People who live with people who have TB
- Which TB treatment is most likely to cause jaundice?
 - Pyrazinamide
- Which other TB treatments can cause jaundice?
 - Isoniazid
 - Rifampicin
- Which TB treatment will stop the combined pill from working, and is most likely to stop HIV drugs from working?
 - Rifampicin
- How soon after starting treatment will the patient stop being infectious?
 - *Within days to 2 weeks. Except if there is multi drug resistance (MDR)*

Lesson 13 **Human Immunodeficiency Virus (HIV)**

BEFORE THE LESSON

- This is a long lesson. We suggest you split it into 2 lessons. You might do one lesson before lunch and one after lunch. Plan to have at least one refreshment break during the lesson in addition to a lunch break.
- There are eight posters in this lesson. (See p. 4 for information on how to use the posters.)
Prepared poster: 1
Student answer posters: 2, 3, 4, 5, 7
Summary poster: 6, 8
- Encourage each student to read Flowchart 1, LIST 1 and the WHO algorithm before the lesson.
- For the practical in section 4, you will need:
 - one white cup for each student
 - enough water to fill each cup one-third full
 - enough starch solution to fill *one* or *two* cups one-third full
 - an instruction card for each student, prepared before the lesson
 - 10 ml of povidone iodine 10%. Keep this separate.

How to prepare the instruction cards

For the practical, give each student one of four different types of cards. The instruction cards will tell students with whom they should mix their water.

1. One or two cards should say:

'You sleep with anyone. Mix your water with 10 or more other people's water.' (If you have up to 20 students, make one card with these instructions. If you have more than 20 students, make two cards.)

2. Half of the cards should say:

'You sleep with 4 or 5 people. You do not use condoms. Mix your water with 4 or 5 different people's water.'
(So, if you have 20 students, make 10 cards with these instructions.)

Divide the remaining cards into two more or less equal groups:

3. Some cards say:

'You only sleep with one other person. Mix your water with *one other person's* water. Do this *with the same person* 4 times.'
(So, if you have 20 students, make four cards with these instructions.)

4. Some cards say:

'You sleep with two or three people. You always use condoms. *Talk* to two or three other people. *Do not mix your water with anyone.*'
(So, if you have 20 students, make four cards with these instructions.)

Preparation on the morning of the lesson

1. Make the starch solution by mixing mix ½ teaspoon of clothes starch (or maize flour or cassava flour) in a cup which is one-third full of water (or water that has been used to cook rice). *If you use flour instead of starch, or rice water instead of water, test that the game will work before the lesson.*

2. In the classroom: fill *one cup only* one-third full with starch solution. If you have more than 20 students, fill 2 cups one-third with starch solution. Fill *all other cups* one-third full with *water*. *Make sure that you do this before the students arrive.*

Lesson plan

1 Quiz

2 Diagnosis and management

3 When to send patients to hospital or clinic

4 Practical: How to avoid HIV

5 Mothers, young children and HIV

WHO algorithm for advanced HIV disease

6 Answers to the quiz

SECTION 1: Quiz

POSTER 1:
(Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. How is HIV passed from one person to another?
2. Which illnesses does HIV make more common?
Which infections are likely to happen when the CD4 count is below 100 cells/mm³?
3. If a patient is infected with HIV today, when will a blood test show that they have been infected with HIV?
4. How can we prevent people from becoming infected with HIV?
5. What non-communicable diseases are more likely to happen in people who live with HIV?

SECTION 2: Diagnosis and management of HIV and AIDS

Divide Poster 2 into four areas. Label the four areas:

Area 1: What are HIV and AIDS? How are they transmitted?

Area 2: What illnesses are made more common by HIV?

Area 3: How to diagnose HIV in the clinic

Area 4: Treatment for HIV disease and how to prevent HIV infections.

POSTER 2:
(Student answer poster)

Ask each student to write one word, or idea, about HIV and AIDS in the correct area on Poster 2. Next, ask students to write other words or ideas on Poster 2. Add any summary words from the information below that the students have missed. Then, for each of the four areas in turn, ask each student to tell the class what they understand about the word they wrote. Draw a circle around each summary word as the student talks about it. Thank each student for their explanation. Use the following explanations to add useful information and to correct mistakes.

Area 1: What are HIV and AIDS and how are they transmitted?

The Human Immunodeficiency Virus (HIV) slowly **kills** the body's **CD4** white blood **cells**. The white cells help to protect the body against infections. Many people with HIV infection have no symptoms and stay well for months or years. As HIV kills more and more CD4 white blood cells, the patient will get more infections. These common infections kill many patients in poor and tropical countries. If a person who has HIV infection lives for several years, they will become ill with **unusual diseases**. When this happens, the patient has **Acquired Immunodeficiency Syndrome (AIDS)**. Many patients with HIV infection have no symptoms and are well. Other HIV patients have many swellings in the neck and under the arms. These swellings are smaller than 6 cm across.

HIV is **passed** from one **person to** other **persons**:

- during sexual intercourse **if a condom is not used**. (Other sexually transmitted **diseases** also help HIV to infect other people.)
- **by blood transfusion** if blood is not tested for HIV.
- by using **needles** that have **not** been **sterilised** and are reused for injecting medicines or drugs
- **from an HIV-infected mother to her baby**, during **pregnancy, birth** or through **breastfeeding**. About one in three babies born to mothers who have HIV are infected with HIV if the mother is not taking Antiretroviral Therapy (ART).

Tell your students:

There is a small risk that a mother who has HIV can pass on HIV if she breastfeeds her baby. However, if the mother is taking Antiretroviral Therapy (ART) regularly, her viral load is usually so low that the baby is unlikely to become infected with HIV. For mothers who have HIV, breastfeeding their baby is usually safer than bottle feeding. Bottle feeding with artificial feeds, like baby formula (substitutes for breast milk), can be dangerous. If a mother bottle-feeds her child, the risk of the child dying from other illnesses, like malnutrition, pneumonia or diarrhoea, is increased 25 times.

*If a mother has HIV, it is **only** safer to use artificial feeds instead of breast feeding **if** the mother is able to sterilise the bottles and buy enough baby formula to mix it correctly with safe, clean water **at all times**.*

HIV is **not transmitted**:

- by **mosquito bites**
- by **sharing food, tools for eating** or by **touching unbroken skin**.
- from **vomit, urine or sweat**.

Area 2: Illnesses which are made more common by HIV

People with HIV are more likely to get some infections and illnesses.

The following illnesses are made more common by HIV:

1. herpes zoster
2. pruritic papular eruption of HIV
3. pneumonia and sinusitis
4. pneumocystis jirovecii pneumonia (PCP or PJP),
5. tuberculosis (TB)
6. oral candida and candida of the gullet (oesophagus)
7. oral hairy leukoplakia
8. seborrheic dermatitis
9. weight loss, persistent diarrhoea
10. parotitis
11. non-typhi salmonellae
12. Kaposi's sarcoma
13. cryptococcus

If a patient has one of these illnesses, treat the illness and talk to the patient about HIV. If the person is not already know to have HIV, encourage them to have a test.



Herpes zoster:
made more common by HIV

Area 3: How HIV is diagnosed in the clinic

HIV is usually diagnosed with a test called an **antibody test**. The test looks for antibodies to the virus in a sample of the patient's blood. The blood sample is usually taken with a finger prick. The body's immune system produces antibodies to HIV after infection with the virus.

It can take up to 12 weeks for the body to produce antibodies. An **HIV test** will **not show whether a patient** has been infected with HIV **until up to 12 weeks after the infection**. 95% of people will have antibodies with 6 weeks.

Area 4: Treatment for HIV and AIDS

- There is **no treatment** available that **can completely cure HIV**.

But:

- Antiretroviral therapy (**ART**), taken regularly will **keep** people infected with HIV **well** and **stop** them **from infecting others**. ART is a lifelong treatment.
- Co-trimoxazole taken regularly, will prevent Pneumocystis Jirovecii Pneumonia (PCP) and Toxoplasmosis. (This is not needed if the CD4 count is above 200 cells/mm³.)
- People with HIV can be **treated for other infections**.
- Children and adults can have almost all the usual **immunisations**. **Except some live vaccines**:
 - Instead of the live oral polio vaccine the dead injectable vaccine is given.
 - Instead of the live oral typhoid vaccine the dead injectable vaccine can be given.
 - If the CD4 count is less than 200 cells/mm³ the MMR vaccine, the yellow fever vaccine and the chickenpox or shingles vaccines should be delayed.
 - An extra COVID-19 vaccine is usually recommended if the CD4 count is less than 200 cells/mm³.
- People with HIV can cope better with their illness if they receive **counselling** and practical help.
- You can help people with HIV to **stay well** by supporting them to eat a **mixed diet**, including five pieces of fruit or vegetables every day. Advise them to **go for treatment quickly** if they get ill especially if they have a fever, sores or ulcers in their mouth or on their lips, or if they feel suicidal, or if others are worried about how they are behaving.

Seroconversion illness

When people become infected with HIV they may have a minor illness, a bit like glandular fever, or the flu, perhaps 2-4 weeks later. Fever, a widespread maculopapular rash, sore muscles, a sore throat and a headache are all common. But most people do not know that they have just become infected with HIV. Despite this they are still infectious to other people. If someone is worried that they might have been infected with HIV recently it may be worth waiting for 4 weeks before they get tested. And to make sure they are not infected it may be worth doing another test 12 weeks after exposure to the virus. Do not give Pre Exposure Prophylaxis (PrEP) during a seroconversion illness. Treat them with ART.

The CD4 count

If people infected by HIV are not diagnosed, or given ART, they will then often have very few symptoms, perhaps for 5 years. During this time they may have small volume lymph node enlargement. (Huge lymph nodes (larger than 6cm) are likely to be either TB, or lymphoma. Both of which are also linked with HIV.)

After about 5 years, the CD4 count may drop below 400 cells/mm³, increasing the risk of serious illness with pneumococcal infection, Tuberculosis, and septicaemia from Non-typhoid salmonella (which unlike Typhoid usually only causes diarrhoea). HIV itself can cause weight loss and night sweats, an itchy skin rash, unexplained fever, or long term diarrhoea. Shingles, oral and gullet thrush, and oral hairy leukoplakia are all common at this stage too.

As the CD4 count goes further down to below 100 cells/mm³, the following infections happen: Cryptococcus; Mycobacterium Avian Complex; CMV (cytomegalovirus); and toxoplasmosis.

CMV causes blindness by affecting the back of the eye, and can be treated.

Toxoplasmosis is one of the causes of seizures and /or a reduced level of consciousness in these patients. It can be prevented by using co-trimoxazole.

(Co-trimoxazole is also taken to prevent Pneumocystis Jirovecii Pneumonia (PCP) isosporiasis diarrhoea, and malaria).

Cryptococcus causes meningitis, with a severe headache, fever and confusion. It is difficult to treat.

Mycobacterium Avian Complex is a difficult diagnosis to make.

Almost all patients with a low CD4 count (less than 200 cells/mm³) should take a preventative dose of co-trimoxazole. Without ART it takes 9 years, on average, for the CD4 count to drop below 200 cells/mm³, at which point they are said to have Acquired Immunodeficiency Syndrome (AIDS).

Treatment for infections and illnesses which are made more common by HIV

Most of the illnesses that are made more common by HIV are linked with a low CD4 count. Early treatment with Antiretroviral Therapy (ART) will make all of these problems less likely, and ART is sometimes the only treatment that is available to make patients feel better, particularly if the CD4 count is below 100 cells/mm³.

The treatable infections that most commonly kill people with HIV are: Streptococcus Pneumoniae (the cause of bacterial pneumonia and sinusitis); TB; cryptococcus; long term diarrhoea and wasting; and malaria (which is also made more common and more serious by HIV).

(Visceral leishmaniasis is made more serious by untreated HIV infection - Visceral leishmaniasis is only found in certain areas).

How to treat illnesses made more common by HIV

POSTER 3:

(Student answer poster)

Ask the students how to treat the infections and illnesses below.

1. **Herpes zoster (shingles)** - Herpes zoster causes an area of skin on one side of the body to become red, blistered, ulcerated and painful. **Treat** in the **same way as any ulcer. Clean and cover the skin.** When the ulceration heals, it normally leaves a scar. Consider using low dose amitriptyline (eg 5-10mg at night) for burning or electric shock pain after shingles.

2. **Pruritic papular eruption of HIV** - Pruritic means itchy. Papules are small lumps in the skin. This skin condition affects 30% of HIV patients and is often the first thing that is noticed by patients and clinicians. It does not affect the webspace between the fingers (unlike scabies). It is however more likely to affect the forearm, hands, lower legs and feet than the trunk. It usually gets better soon after ART is started. Antihistamine can help the itch but are not a cure. Warts and molluscs contagiosum tend to be very extensive in HIV too.

3. **Pneumonia or sinusitis** - If the patient has had pneumonia or sinusitis, they may have HIV infection. See Lesson 2 about pneumonia. Sinusitis is an infection of a sinus. If a patient has pain in the face, and yellow or green discharge coming from his nose, diagnose sinusitis. **Treat with antibiotics for 5-7 days.** Give children aged 12 or less amoxicillin or co-trimoxazole. Give patients aged 13 and over, who are not pregnant, doxycycline 100 mg



Pruritic papular eruption of HIV

capsules, after food, 2 capsules on day 1 then one a day for 5-7 days in total.

4. **PCP or PJP.** PCP is a type of pneumonia. PCP is short for **Pneumocystis Jirovecii Pneumonia**. If a **child less than one year old has a cough for more than 3 weeks**, they may have PCP. Send them to hospital. If a patient with known, or suspected, HIV has rapid breathing, dry cough worse on exercise (possibly also weight loss or night sweats), they may have PCP pneumonia. High dose co-trimoxazole for 3 weeks is worth considering.

5. **Tuberculosis** - see Lesson 12.



Oral candida

6. **Oral candida** - Oral candida (sometimes called thrush) causes a painful mouth. See Lesson 14. Candida of the gullet (Oesophageal candida) causes painful and difficult swallowing (Give Fluconazole 200mg daily for 7 days and review. They may need 14 days.)

7. **Oral hairy leukoplakia** - You will find white lines on the side of the tongue. Oral hairy leukoplakia is painless and **needs no treatment**.

8. **Seborrhoeic dermatitis** - is a flakey skin condition that especially affects the areas on either side of the nose and the eyebrows. It also affects the area over the breast bone. Clotrimazole cream once (or twice) a day will control the symptoms.

9. **Weight loss with persistent diarrhoea** - Patients with HIV may have diarrhoea and fever often. This causes weight loss. Sometimes the diarrhoea is caused by unusual parasites. If the patient is dehydrated **give oral rehydration solution** (see Lesson 6). If they are not dehydrated, advise them to drink plenty of fluids. Advise all patients to eat a **mixed diet**. Send to hospital.

10. **Parotitis** - If a child **between 1 year old and 2 years old** has a painful swelling over the angle of the jaw, the child has **parotitis** and may have HIV. (Mumps can also cause parotitis and a fever. Mumps usually affects children aged over 5 years.) Give **paracetamol for pain** if needed. Show students where the angle of the jaw is. Parotitis in young children is part of a problem called **Lymphocytic Interstitial Pneumonitis (LIP)**. These children usually have a cough and fast breathing and should have a chest X-ray to confirm the diagnosis.

11. Patients with more advanced HIV disease or AIDS may get other illnesses, including non-typhoid salmonella, Kaposi's sarcoma and cryptococcus. **Non-typhoid salmonella** in HIV patients behaves like typhoid and causes sepsis. Patients have fever that does not get better with malaria treatment, and they need to **go to hospital**. There are many causes of fever in advanced HIV.

12. **Kaposi's sarcoma** is a cancer which shows as purple patches on the body. The purple patches grows slowly and usually **do not need treatment**. ART can result in improvement.

13. **Cryptococcus** is a fungal infection that can cause a constant headache.

HIV clinics may be able to treat this. You can give the patient **ibuprofen** 400 mg three times a day to reduce the pain, short term, until the patient gets to clinic.

Other symptoms: cough, diarrhoea, fever and brain disease

Cough is common in HIV. This might have a life-threatening cause, such as bacterial pneumonia, Tuberculosis or Pneumocystis Jirovecii Pneumonia (also known as PCP).

Also HIV itself might cause a post-nasal drip with an irritating cough. PCP typically causes a dry cough with breathlessness that comes on slowly. If the patient's oxygen saturation (measure with a pulse oximeter) is low, or drops with exertion, it is more likely to be PCP. A Chest X-ray will often be useful when looking for PCP or TB when a cough is present.

In young children with HIV, Lymphocytic Interstitial Pneumonitis (LIP) can cause a cough or breathlessness. And this can also be seen on a Chest X-ray.

Long-term diarrhoea (longer than 4 weeks) is common when the CD4 count is less than 100 cells/mm³. It often (87%) improves when ART causes the CD4 count to rise above 200 cells/mm³. It is commonly caused by medication (eg Protease Inhibitors), CMV, Tuberculosis, mycobacterium avian complex (MAC), bacteria or parasites.

There is a good chance that the diarrhoea will improve within 8 weeks of starting ART in combination with co-trimoxazole (with IPT - see below).

If diarrhoea starts soon after starting ART, one of the ART medications might be responsible (eg Lopinavir/Ritonavir). Most diarrhoea caused by ART will improve without the need to change the type of ART. But if the diarrhoea has not improved after 2 weeks consider swapping to a different type of ART. Consider treating for Giardia with metronidazole 400 mg three times a day for 5 days - see Lesson 6 Diarrhoea.

Fever is a worrying symptom in people living with HIV. The most common causes of death in HIV are: Tuberculosis; Pneumonia; Sepsis (from Strep. Pneumoniae and Non-Typhoid Salmonella); Malaria; Cryptococcus; or long term diarrhoea with wasting. Most of these problems cause a fever. Malaria can kill much faster in people living with HIV. Sepsis should be suspected if the malaria tests are negative and the fever does not seem to be linked to another obvious cause such as a viral upper respiratory infection or pneumonia. Please read the flow chart on the following page

Brain disease. Cryptococcal meningitis is quite common with CD4 counts less than 100 cells/mm³. It causes severe headache, seizures or reduced level of consciousness.

Toxoplasmosis and Tuberculosis are amongst the many other causes of headache, seizures and reduced level of consciousness in advanced HIV.

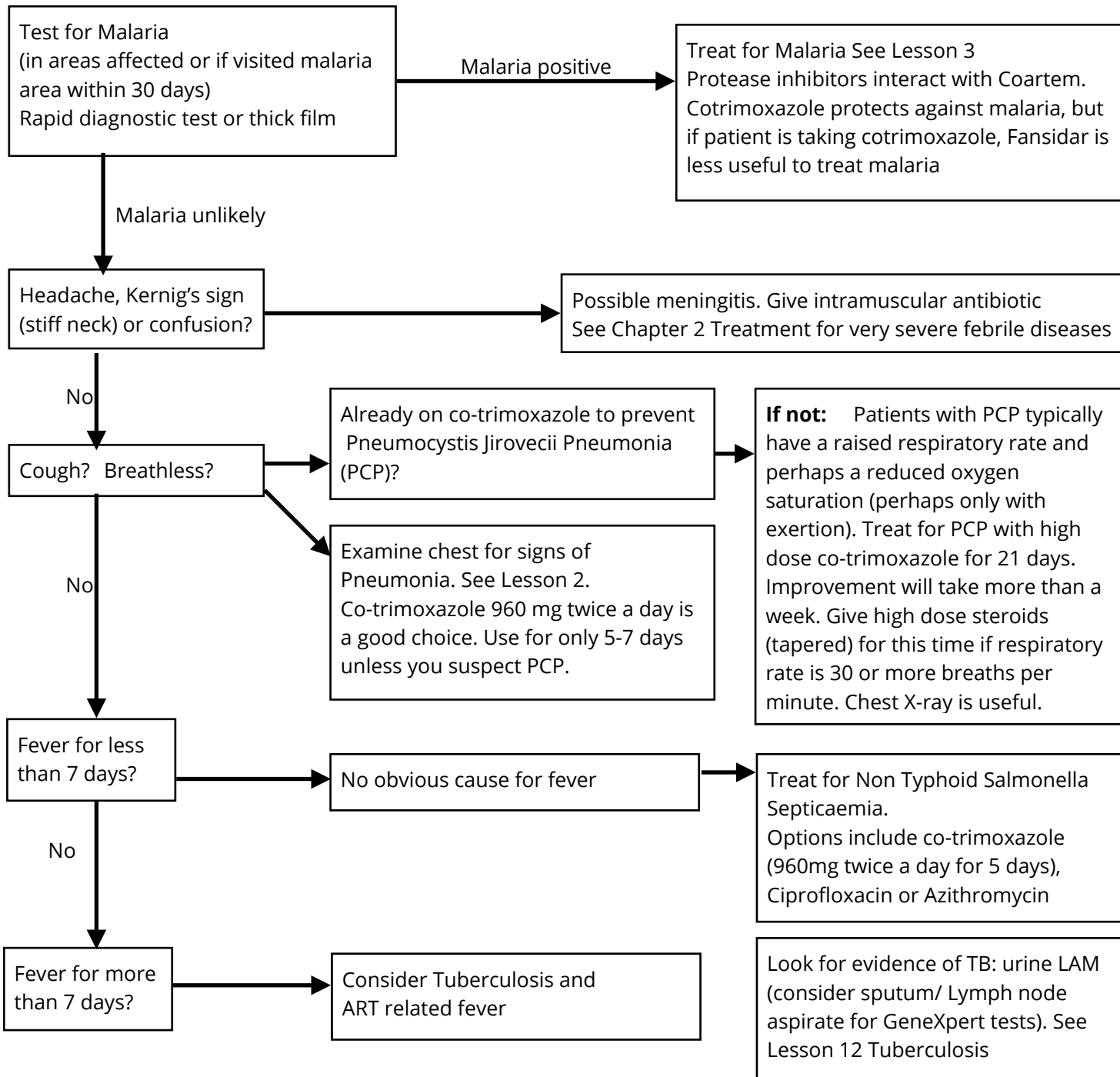
Preventative treatment with co-trimoxazole (which is mostly used to prevent PCP) protects against Toxoplasmosis.

TB should also be looked for. Urinary LAM test is a useful test to look for evidence of TB when the CD4 count is low.

Consider malaria and meningitis as causes of headache with fever.

A recently started ART medication may be responsible if there is no fever, check: https://www.aidsmap.com/sites/default/files/2019-07/ARV_drugchart_2019_final_web.pdf

Flowchart 1 **Fever in HIV** - for 48 hours or more, or temperature is 38°C or more



POSTER 4: How to prevent HIV infections
(Student answer poster)

Ask the students what can be done to prevent HIV infections. Look for the following answers and summarise the correct answers as you talk about them:

1. Teach people to **use condoms** during sexual intercourse. Condoms protect against HIV and other sexually transmitted diseases.
2. Consider recommending voluntary **male circumcision** where it can safely be performed. This reduces the chance of passing HIV during unprotected sexual intercourse.
3. **Diagnose** HIV infections **early**. Early treatment will keep people well and prevent others from becoming infected.
4. Uninfected partners of people living with HIV may need to take Pre Exposure Prophylaxis (**PrEP**) - for example Tenofovir/emtricitabine (truvada) - until their infected partner's viral load is undetectable if they want to have sexual intercourse. Pregnant and breast feeding women who continue to be at risk of contracting HIV should use PrEP when exposed to a positive partner (unless their viral load is undetectable). PrEP does not seem to alter how effective oral contraception is. However Efavirenz does make oral contraception and postcoital contraception ineffective.
5. Send people for **treatment for other sexually transmitted diseases**, and ask them to take their partners for treatment. Sexually transmitted diseases increase the chance of passing HIV from person to person during sexual intercourse.
6. Make sure **blood for transfusion is safe** by testing it for HIV. Reduce unnecessary blood transfusions. Only give blood if it is needed to save a patient's life. Only give a transfusion:
 - if a patient has a haemoglobin (Hb) of 5 g/dl or less
 - if a woman in the last month of pregnancy has haemoglobin of 7 g/ dl or less
 - if a patient is bleeding very heavily and the bleeding is not stopping.
7. Use **safe procedures in health centres**:
 - cover open wounds or cuts on your hands and arms
 - make sure that needles and syringes are properly sterilised
 - put used needles in a tin with a lid to avoid injuries. Bury the tin if you do not re-use and sterilise the needles.
8. If a health worker is exposed to HIV possible infection they can be given Post Exposure Prophylaxis (**PEP**). If a health worker cuts their skin with a dirty needle wash the cut with soap and water. PEP should be available and should be started immediately (or as soon as possible within 72 hours) to reduce the chance of injured health workers becoming infected with HIV. The risk is only 0.3% per injury. (The risk of contracting hepatitis B or C is much higher.) PEP reduces this risk by 80%. PEP is used for 1 month. PEP should also be offered to victims of rape and considered for those with mucous membrane (vagina, rectum, eye mouth or broken skin) exposed to contact with blood or sexual fluids (vaginal, semen). There is a negligible risk of HIV infection with exposure to urine, nasal secretions, saliva, sweat or tears.
9. **Pregnant women** should usually have an HIV test early in pregnancy. The test should be repeated if the woman may have been exposed to virus during pregnancy. Remember that it may take up to 12 weeks before the HIV test becomes positive after exposure. In many areas the HIV test will be repeated during delivery.
10. Teach people who inject drugs how to **sterilise needles and syringes** with bleach and water.

Treatment for HIV - Antiretroviral therapy (ART)

Antiretroviral therapy (ART) usually includes 3 medications. They are often included in a single tablet, or perhaps 2 tablets, so that patients don't need to take so many tablets. Two of those medicines are called Nucleoside Reverse Transcriptase Inhibitors (NRTIs).

The third drug may be an Integrase Inhibitor such as Dolutegravir. Another example might be a Non-Nucleoside Transcriptase Inhibitor (NNRTI) such as Efavirenz.

Many ARTs are affected by taking other medicines. Rifampicin is one medicine (used for treating TB) that can make HIV medications less effective. We recommend that you check on this website - www.hiv-druginteractions.org/checker before prescribing anything for a patient on HIV medication.

An example of ART might be: tenofovir + lamivudine (or emtricitabine) + dolutegravir

HIV medications commonly - like most medications - cause unintended symptoms or side-effects. Most side-effects are a temporary nuisance. Diarrhoea being one of the most common. Diarrhoea caused by ART usually settles within a few days, but if it does not improve within 2 weeks it may be worth swapping to a different ART.

Possible side-effects of ART are summarised on this link:

https://www.aidsmap.com/sites/default/files/2019-07/ARV_drugchart_2019_final_web.pdf

Stevens Johnson Syndrome is an uncommon but serious side-effect of some medications (NNRTIs such as Nevirapine or Etravirine). Usually Stevens Johnson Syndrome starts with a fever, sore throat and tiredness. Skin soreness is common but the diagnosis is often made when the patient gets sores of the mouth and lips and other mucous membranes (eg conjunctivae and genitals). Some medications seem to be linked with drastic behaviour changes such as suicidal thoughts (Raltegravir) or psychosis (Efavirenz). A third problem is jaundice and liver failure.

Patients starting on ART should be warned of the small chance of any of these 3 rare side-effects and what should do if they, or a relative or friend, think they might have a serious side-effect. If you suspect Stevens Johnson Syndrome, behaviour change or yellow jaundice (visible on the white of the eye) there should be an urgent review of the ART. (Jaundice may also be caused by co-trimoxazole, TB medications, alcoholic liver disease or hepatitis B or C).

Almost all types of ART are safe during **pregnancy** and during breast feeding, but there is some uncertainty about Dolutegravir in the first 6 weeks of pregnancy. But the benefits probably outweigh the risks. Dolutegravir is safe in the last 7 months of pregnancy. All women on ART or TB medication should be taking 5 mg of folic acid in the first 3 months of pregnancy. If the mother is not taking ART during pregnancy but has HIV, there is a 20% chance that she will pass it to her baby. If she takes regular ART that chance drops to 1%. If her viral load is undetectable she will not pass HIV on to her baby.

Breast feeding is recommended as the safest way to provide nutrition in low income countries despite the mother having HIV. The best way to protect the baby is to ensure that the mother is taking regular ART (and that the viral load is completely suppressed). If the mother's viral load is detectable the baby should also be given ART (eg zidovudine and nevirapine) for 6 weeks after birth. In Africa the risks of diarrhoea and malnutrition are higher than the risk of a baby getting HIV from breast feeding. There is a 10-15% chance of contracting HIV by breast feeding if the mother is not treated with ART.

Almost all patients with a CD4 count below 200 cells/mm³ should be taking **co-trimoxazole to prevent Pneumocystis Jirovecii Pneumonia (PCP)** and toxoplasmosis. If it is impossible to check the CD4 count it is reasonable to take co-trimoxazole long term - unless co-trimoxazole causes Stevens Johnson Syndrome.

Women preparing for pregnancy or in the first 3 months of pregnancy should take folic acid 5mg daily since co-trimoxazole can affect folic acid levels. A lack of folic acid in the first 3 months of pregnancy can cause neural tube defects such as spina bifida.

If there are no symptoms of Tuberculosis at diagnosis (consider doing a chest X-ray and GeneXpert) (or after TB treatment has finished) patients are given **Isoniazid preventive treatment (IPT)**. This consists of Isoniazid 300 mg daily with pyridoxine 25 mg daily. It is usually given for at least 6 months, and often for life. Co-trimoxazole and IPT are usually started at the same time as ART. A fixed-dose combination of co-trimoxazole 960 mg/Isoniazid 300 mg/Pyridoxine 25 mg is increasingly available in low-resource settings.

Pyridoxine (vitamin B6) supplementation is recommended for children and adolescents living with HIV and in all people on treatment for TB (when taking Isoniazid).

The HIV clinic will screen for cryptococcus with a serum CrAg test (a blood test) if the CD4 count is less than 200 cells/mm³. They may give treatment to prevent cryptococcal meningitis (fluconazole 100mg daily for 6 weeks). If the CD4 count is less than 100 cells/mm³ they may give preventative fluconazole if CrAg can't be tested.

Refreshment break. We suggest that you might even take a meal break here.

Part 2:

IRIS - Immune Reconstitution Inflammatory Syndrome

Antiretroviral treatment (ART) is life saving and is taken lifelong. If the CD4 count is very low (less than 200 cells/mm³) patients are at a high risk of dying until the CD4 count recovers. This recovery may take 3 months. As patients start on antiretroviral therapy their immune system starts to work again and causes inflammation. Unfortunately, this can make patients feel unwell. This is especially common if the CD4 count is very low. An example of this is when there is a lot of inflammation around TB mycobacteria or cryptococcus. This is called an Immune Reconstitution Inflammatory Syndrome reaction or IRIS for short.

Some patients may blame their medication for feeling more unwell. But it is important that they don't stop their medicines in error. By warning patients that this might happen we can encourage patients to see their HIV clinician if they feel unwell, rather than stopping their medication. Steroids are often the best treatment for these IRIS reactions.

Because IRIS reactions can be very dangerous in TB meningitis, and in cryptococcal meningitis, it is important to treat the TB meningitis or cryptococcal meningitis first for at least 4 weeks (perhaps 8) before starting ART for the HIV infection. Treat TB and cryptococcus at other sites for 2 weeks prior to starting ART. Headache, cough, recent weight loss, night sweats and fever should be investigated for cryptococcus or TB as relevant before starting ART. Treat high risk patients eg. TB meningitis with a preventative dose of steroids. (eg 40mg/day for 14 days then 20 mg/day for 14 more days).

For other people diagnosed with HIV and another co-infection. Treat PCP, toxoplasmosis, CMV or TB without meningitis first then start ART within 2 weeks.

IRIS reactions are often treated with prednisolone (eg 40 mg/day for 14 days then 20 mg/day for 14 more days). It is important in almost all IRIS reactions that the ART should be continued.

Drug reactions and interactions

Many HIV medications can cause unwanted symptoms. These are summarised in Appendix 33. HIV medications can interact with other medications. Please check any medications are OK to use with ART: www.hiv-druginteractions.org/checker

We give you some of the most important interactions to watch out for here:

Efavirenz (a NRTI) can make Ulipristal less effective as a form of emergency contraception. Ulipristal should not be used if a patient is on Efavirenz. Efavirenz makes most oral contraceptives ineffective. If Levonelle is used for emergency contraception for women taking a Protease Inhibitor then use a double dose: 3 mg rather than 1500 µg should be given.

Many HIV medications are affected by using rifampicin (as part of treatment for TB). The most common NRTIs used in low and middle income countries are OK with rifampicin: Tenofovir disoproxil (TDF), Lamivudine (3TC), Emtricitabine (FTC), zidovudine (AZT.)

But Rifampicin reduces the levels of Tenofovir alafenamide (TAF). Dolutegravir (an Integrase inhibitor) often used as the 3rd medication as part of NRT needs to be given twice a day (rather than the usual once a day) when taken with rifampicin.

Protease inhibitors can **not** be used with Rifampicin. Neither can Nevirapine.

Efavirenz (a Non-Nucleoside Reverse Transcriptase Inhibitor - NNRTI) is OK to use with rifampicin.

POSTER 5: (Student answer poster)

Who needs to know about HIV and AIDS?

Ask your students which people need to know how to prevent HIV. Summarise their ideas on Poster 6 as students call them out. After the students have finished giving you their ideas, tell them *that all answers to this question are correct.*

It is important for **everyone to know about HIV and AIDS.**

Everyone needs to know how to prevent HIV infections.

Use a thick pen or large letters to write '**Everyone**' on Poster 5.

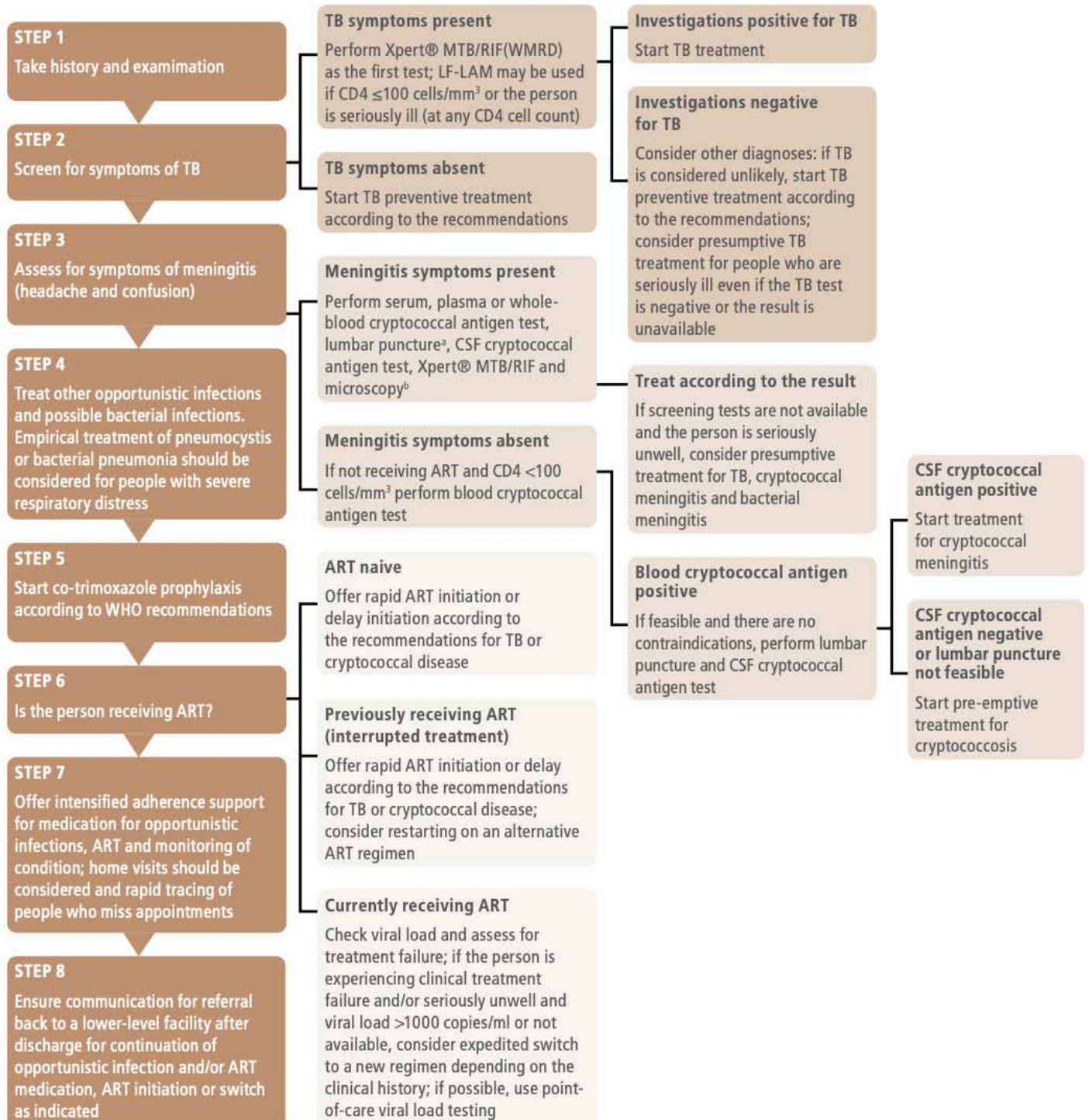
HIV testing

It is important to encourage anyone who might be infected with HIV to be tested. HIV treatment is very effective at keeping infected people well. Sadly, many people die because their HIV is not diagnosed until they are dangerously unwell. HIV treatment also makes people non-infectious. For most people: consenting for an HIV test is just a matter of checking that the patient has no objections to having a test. Counselling means helping patients to decide what to do. Your job is to answer questions and give the patient information so that they can decide what they want to do.

Usually an HIV test is done on a finger prick sample of blood. Rapid tests are based on antibodies. They are appropriate to use on anyone over the age of 12 months.

WHO Algorithm for providing a package of care for people with advanced HIV disease

- Any person who has signs of being seriously ill should be referred to the appropriate higher-level facility for management.
- A seriously ill adult is defined as having any of the following danger signs: respiratory rate ≥ 30 breaths per minute; heart rate ≥ 120 beats per minute; or unable to walk unaided. Other clinical condition, such as temperature $\geq 39^\circ\text{C}$ combined with other signs such as headache, can also be considered based on local epidemiology and clinical judgement. A seriously ill child is defined as having any of the following danger signs: lethargy or unconsciousness; convulsions; unable to drink or breastfeed; and repeated vomiting. Other clinical conditions such as temperature $\geq 39^\circ\text{C}$ and age-defined tachycardia and/or tachypnoea can be considered based on clinical judgement.
- Clear criteria for referral should be available. If the person is not seriously ill, the decision as to what interventions may be decentralized will be programmatic.
- For those hospitalized: mortality is highest in the first 48 hours after admission. Steps 1–4 should be completed as soon as possible on the same day as presentation. Based on clinical assessment: start TB and opportunistic infection therapies as soon as possible among those who are seriously ill. The availability of point-of-care diagnostics (CD4, cryptococcal antigen, LF-LAM and viral load) will support rapid diagnosis, including at decentralized sites.



ART: antiretroviral therapy; CSF: cerebrospinal fluid; TB, tuberculosis; LF-LAM: lateral flow urine lipoarabinomannan assay.

^a Everyone who is cryptococcal antigen positive and has headache or confusion should have a lumbar puncture.

^b In settings where test results are available quickly, testing for cryptococcal infection before TB infection would be more cost-effective.

Co-trimoxazole and ART are given to babies born to mothers who have an HIV viral load until it is possible to test the baby for HIV.

If it is possible to do a PCR (NAT) test at, or after, 6 weeks the co-trimoxazole and ART can then be stopped.

In many areas it is necessary to test for both HIV-1 and HIV-2. HIV-1 is usually much more common, but both viruses cause the same problems. But slightly different ART is used to treat HIV-2 so in areas where both infections might be present it is important to confirm which type of HIV the patient has. Antibody tests are usually confirmed with second test with may be an antigen test.

Vaccines for people living with HIV

It is important to vaccinate people who are living with HIV against most diseases that can be protected against with a vaccine. But babies exposed to HIV should not receive the BCG vaccine until after they test negative for HIV at 6 weeks (this is a PCR test since the antibody test is unreliable in babies until they are 9 months old.) And BCG is generally not recommended for people with HIV infection.

Instead of the live oral polio vaccine the dead injectable vaccine is given. Instead of the live oral typhoid vaccine the dead injectable vaccine can be given. If the CD4 count is less than 200 cells/mm³ the MMR vaccine, the yellow fever vaccine and the chickenpox or shingles vaccines should be delayed. An extra COVID-19 vaccine is usually recommended if the CD4 count is less than 200 cells/mm³.

POSTER 6:

(Summary poster)

How to counsel patients about HIV testing

1. Tell the patient (or the carer, if the patient is a child) **why you think that they might have HIV.**
2. Explain to the patient that there is no treatment that will cure HIV. Antiretroviral therapy (**ART**), when taken regularly, will **keep** most people with HIV **well** and **stop** them **from transmitting HIV** to others.
3. **Give** the patient **time to understand** what you have said.
4. **Encourage the patient to ask questions.** Answer questions and make sure the patient understands the information.
5. They should be told how the result will be shared with them.
6. **Teach** the patient **how to prevent** other people from becoming infected with **HIV.**

SECTION 3: When to refer HIV patients

LIST 1 When to refer patients who may have HIV to hospital

Refer urgently to hospital, or to clinic, for diagnosis and treatment if:

The patient has any of these danger signs (treat for very severe febrile illness):

- Respiratory rate above 30/min
- Oxygen saturation less than 90%
- Temperature greater than 39°C.
- Heart rate above 120/min
- Inability to walk without help
- Systolic Blood Pressure below 90mmHg.
- Severe headache, difficulty moving the neck or behaving strangely.
- The patient's fever is no better 2 days after treatment (for example for malaria). Please see fever in HIV flowchart.
- The patient is a child less than 1 year old who has had a cough for more than 3 weeks.

Refer to the next clinic for diagnosis and treatment if:

- The patient has a sexually transmitted disease (send to a clinic that treats sexually transmissible diseases).
- The patient has had a cough for more than 3 weeks or has blood in the sputum (send to the TB clinic).
- The patient has lost weight with no obvious cause.
- The patient has had diarrhoea for more than 2 weeks that does not improve after a course of metronidazole.
- The patient has unusual skin rashes.

Encourage HIV testing if:

- A patient wants to know if they have been infected with HIV (they may need to be retested 12 weeks after the last possible exposure to HIV).
- The patient has had an opportunistic infection that is made more common by HIV, for example:
 - Herpes zoster, oral candida or oral hairy leukoplakia.
 - The patient has Kaposi's sarcoma.
 - A child aged between 1 and 2 years has parotitis.
 - A patient has had sinusitis or pneumonia

SECTION 4: Practical: How to avoid HIV

Tell your students that this game shows how easy it is for HIV to infect a large number of people. Make sure your students understand that this only a game. They are *only pretending* to have sexual intercourse and they are *only pretending* to pass on HIV infection.

Some students may find a game about sexual intercourse embarrassing. Tell your students that HIV is a very important and serious health problem. This game will help them to understand how HIV is passed from one person to another person and they will be able to advise their patients better.

The Game

Give a cup and an instruction card to each student (see page 169). Give one student the cup with starch solution and a card with the instruction 'You sleep with anyone ...'

Give all other students cups with water and a card.

Do not tell this student or the other students that one cup is different from the other cups. It is important that none of the students knows that one cup is different. This cup is the source of the 'HIV infection' in the game.

Tell the students:

- In this game, the water in the cups represents body fluids. Each time you mix your water with someone else's water, this represents sexual intercourse.
- Your card tells you who you can mix your water with. Follow the instructions on your card. Remember that if your card says 'You always use condoms', you *must not* mix your water with anyone else's water.
- You have 10 to 15 minutes to play the game. Walk around the classroom and talk to at least four other students. Tell each student you talk to what is written on your card.
- If your card *and* the card of the student you are talking to tells you to mix water together, pour *all* your water into the other person's cup. Next, pour *half* of the water back into your own cup.

After 10 to 15 minutes:

- Tell the students that you will test the water. You will pretend to test their 'blood' for HIV.
- Tell the students that the water in their cup will turn blue or black if they have 'been infected with HIV' during the game. Tell them the water will turn yellow or brown if they have 'not been infected with HIV'.
- Put four drops of povidone iodine 10% into each cup. Show the students that some of the water has turned blue or black and that some of the water has turned yellow or brown.
- Tell the students that at the beginning of the game, only one person in the class was 'infected with HIV'.
- Ask if anyone knew who was infected before the game. Do not tell the students who was infected.
- Tell the students what was written on the cards of the students who 'were infected with HIV' during the game.
- Next, tell the students what was written on the cards of the students who were 'not infected with HIV' during the game.
- Ask the students what they have learnt from this game. Look for the following answers:

Answer Most people with HIV do not know that they are infected. They may infect a large number of other people without knowing.

Answer It is not possible to know from looking at a person if they are infected with HIV or not.

Answer Condoms protect against HIV infection.

Answer If a person only has one sexual partner, they may still become infected with HIV if their partner has other sexual partners.

Answer People who have many sexual partners and who do not use condoms are most likely to become infected with HIV.

This is why it is important to teach everyone about HIV infection and to advise people to use condoms every time they have sexual intercourse. Male circumcision gives reasonable protection against becoming infected with HIV.

People living with HIV will be treated in a positive health dignity and prevention programme. Usually they will be provided with free condoms where appropriate and guidance to avoid high risk sexual practices where possible. Their partners will be supported with options to avoid acquiring the virus if they are uninfected. And their families will be screened for HIV if necessary. As well as supporting the patient to take their medication the positive health dignity and prevention programme will check for symptoms of TB sexually transmitted infections and cervical cancer. Cervical cancer which causes vaginal bleeding that tends to be worse after intercourse is made more common by HIV. Looking after the emotional and physical health of people living with HIV permits them to take their ART regularly and prevents spread of HIV.

SECTION 5: Mothers, young children and HIV

POSTER 7: Maternal to child transmission (*Student answer poster*)

Preventing mother to child transmission (PMTCT) is just as important as preventing adult infections. Perhaps it is more important. How do you think this might be achieved?

Maternal testing. When mothers present to antenatal services they are tested. Many countries will also test before delivery. Certainly it is a good idea to test women who are at high risk (eg partners of men who are living with HIV) again before delivery.

ART. It is crucial that mothers with HIV are on ART during pregnancy, delivery and breast feeding. Without ART 5-10% of babies become infected during pregnancy; 10-15% become infected during childbirth (it is less likely with caesarian section); and between 5 and 20% of babies are infected through breast feeding when the mother is not taking ART.

At risk babies (HIV exposed infants) are given **preventative treatment**. Low risk babies are given Nevirapine for 6 weeks. High risk babies are given ART (triple therapy eg Zidovudine, Lamivudine and Nevirapine) for 6 weeks. Co-trimoxazole is also given to babies at a preventative dose until HIV negative status can be confirmed (usually at 24 months).

High risk means that the mother has been on ART for less than 4 weeks, or they have a high viral load or their HIV infection was only identified in the postnatal period.

Breast feeding is usually the **safest** option. This involves exclusive breast feeding for 6 months. Gradual introduction of other foods from 6 months with a plan to stop breast-feeding gradually by 22 months. A final HIV test for the baby would usually be done at 24 months (6 weeks after stopping breast feeding.)

HIV in young children

POSTER 8:
(Summary poster)

5 important ways that young children with HIV present to the clinic

50% of children who are infected from their mothers will die before the age of 2 years if they are untreated. 5% of HIV patients are infected from their mothers. ART almost completely avoids mother to child transmission of HIV if taken regularly by the mother.

To help you to diagnose HIV in young children, as early as possible, we will describe 5 important ways that children with HIV present to the clinic:

1 Young children commonly present with a **fever, cough and breathlessness**. In babies breathlessness is linked to poor breastfeeding. Think of **Pneumocystis Jirovecii Pneumonia**. Pneumocystis Jirovecii Pneumonia often causes fast breathing (and **low oxygen saturation** numbers), but usually it does not cause noises that you can hear even if you use a stethoscope to listen to the chest.

2 **Pruritic papular eruption of HIV** is common in young children. Suspect it if there is a widespread itchy rash, particularly if you can't find any scabies burrows in the web spaces between the fingers. It improves with ART.

3 In young children with HIV, **Lymphocytic Interstitial Pneumonitis (LIP)** can be linked with many **enlarged lymph nodes** and **enlarged parotid glands**. A Chest X-ray should be done to confirm the diagnosis. The treatment includes steroids and early ART.

4 HIV causes **bruising and petechiae** linked to low platelet numbers in the blood. Suspect HIV also if a young child has big lymph nodes or bruising. The low platelet numbers and bruising responds to using ART.

5 Children can have any of the other infections made more common by HIV infection.

HIV testing in children under 2 years of age is different:

- Mother's antibodies cross the placenta to the baby before birth. Therefore HIV antibody tests will not work until 9 months after birth.
- PCR tests will work from several days after infection but these tests are often not available.
- It is important that the mother with HIV stays on ART, and co-trimoxazole, whilst breastfeeding (and for life) and that the child exposed to HIV stays on co-trimoxazole (and sometimes ART) until the child can have their last HIV test.

Telling a child that they have HIV is difficult. They are unlikely to understand what they are told if they are given full information too soon. Usually a child aged 5 to 7 years old is told they have a sleeping germ and that they need daily medicine to keep it asleep. Some children are given full information from the age of 8 to 10 years to help them to cooperate with treatment. The child should know that it is safe for them to kiss and share things. In fact if they are taking regular ART they will not transmit HIV even when they are ready to have sexual relationships.

SECTION 6: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. How is HIV passed from one person to another?
 - Unprotected sexual intercourse (without a condom)
 - Infected blood transfusion
 - Unsterilised needles and syringes used for injecting medicines or drugs
 - From an infected mother to her baby during pregnancy, birth or through breastfeeding

2. What infections and illnesses does HIV make more common?

- Herpes zoster
- Pneumonia and PCP
- Tuberculosis
- Oral and oesophageal candida
- Oral hairy leukoplakia
- Diarrhoea
- Parotitis
- Non-typhi salmonella
- Cryptococcus
- Kaposi's sarcoma

Which infections are likely to happen when the CD4 count is below 100 cells/mm³?

- Cryptococcus
- CMV
- Mycobacterium avium complex
- Toxoplasmosis

3. If a patient is infected with HIV today, when will a blood test show that they have been infected with HIV?

- Up to 12 weeks after the infection

4. How can we prevent people from becoming infected with HIV?

- Encourage people to use condoms during sexual intercourse.
- Diagnose and treat HIV early.
- Send people for treatment for other sexually transmitted diseases and ask them to take their partners for treatment.
- Make sure blood for transfusion is safe by testing it for HIV. Only give blood if it is needed to save a patient's life.
- Using safe procedures in health centres.
- Teach people who inject drugs how to sterilise needles and syringes with bleach and water.

5. What non-communicable diseases are more likely to happen in people who live with HIV?

- Cardiovascular disease (heart attacks, strokes, angina and peripheral vascular disease) is about 25% more likely to happen compared with people who are not living with HIV.
- Dementia is roughly 50% more likely to affect people living with HIV but ART is massively protective against dementia.

Lesson 14 Ear, nose and throat problems

BEFORE THE LESSON

- There are five posters in this lesson. (See p. 4 for information on how to use the posters.)
- Prepared posters: 1, 2, 3
- Summary posters: 4, 5
- Give each student a copy of Appendix 20.
- Ask one student to teach the other students how to make a toothbrush in section 2. He will need a piece of soft wood (for example, from a banana tree) and a knife.
- Prepare one copy of Tables 1 to 4 in section 3 for each student.
- You need a syringe (5 ml or larger), a cup of water, some soap, a bowl and a towel or cloth for the practical in section 4.
- Listen to this podcast about difficulty swallowing created by Professor Bob Mills: <https://podcasters.spotify.com/pod/show/the-virtual-doctors/episodes/Difficulty-Swallowing-e2c69po>

Lesson plan

1 Quiz

2 Diagnosis and management

3 When to send patients to hospital

4 Practical

5 Answers to the quiz

SECTION 1: Quiz

POSTER 1:

(Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. A patient has a fever and a yellow or green discharge from their ear. How will you treat them?
2. What are the symptoms of diphtheria? How do you treat diphtheria?
3. What are the symptoms of epiglottitis? How do you treat epiglottitis?

SECTION 2: Diagnosis and management

Today you will learn about the most common and important ear, nose and throat problems. It is unusual for these problems to cause death.

If a patient has a problem that you do not know how to treat, send him to the ear, nose and throat clinic.

Ear problems

Ask the students to look at Appendix 20 and to tell you what the common symptoms of ear problems are.

Pain or swelling

If a patient has **pain in the ear or swelling near the ear**, press behind the outside part of the ear, the ear hole and in front of the ear:

- If a patient has a **tender swelling behind the ear** they may have a bacterial infection called **mastoiditis**.
- If the **ear itself (the Pinna) is swollen**, the patient may have a bacterial infection called **cellulitis**. Treat cellulitis or mastoiditis with ciprofloxacin. If the patient is unwell: give an intramuscular injection of procaine penicillin fortified or benzylpenicillin. Next, send unwell patients to hospital immediately.
- If a patient has a **tender ear hole**, they may have **infected otitis externa**. Treat infected otitis externa with ear drops that contain an antibiotic and a steroid for 5 days. An alternative for mild infections is acetic acid ear drops (a mixture of half sterile white vinegar and half sterile water).
- If a patient has a **fever** with a very painful ear but the **ear hole is not tender** the likely diagnosis is **otitis media**. Treat with antibiotic if the patient is immunosuppressed (eg steroids or HIV) or if the patient is a child under 2 years old with both ears infected or has discharge from the ear (this usually quickly relieves the pain). Amoxicillin or clarithromycin are suitable antibiotics. For low risk patients treat with pain relief but use antibiotics if they get worse or do not improve within 3 days.
- If the area in front of the ear is tender and swollen, ask the patient to bite her teeth together. If the patient has a **tooth abscess**, it will be painful to bite their teeth together.
- If there is a **swelling in front of and below the ear**, the patient usually has **mumps**. Mumps is a virus infection which causes the parotid glands at the corner of the jaw to swell. Many patients with mumps have a swelling on both sides of the face. The patient does not need an antibiotic. Advise them to eat a mixed diet. Tell the patient that the swelling will go away after about 1 or weeks.

Discharge

If there is a **green or yellow discharge** from an ear, the patient may have **otitis media, infected otitis externa or a foreign body in the ear**. If there has been fever, treat with co-trimoxazole for 5 days in malaria areas. Or treat with amoxicillin if the patient is pregnant, or there is no malaria in your area. It is sensible to gently clean away the discharge from the pinna. Advise the patient or carer not to poke inside with cotton buds and to avoid getting water inside the ear. If the discharge is no better 1 week after starting treatment, send the patient to the ear, nose and throat clinic.

Itching

If there is itching in both ears, the patient may have **otitis externa**. Give steroid ear drops. Prednisolone, betamethasone or triamcinolone ear drops are all suitable. Give 2 drops three times a day for 5 days.

Noises in the ears

If the patient has **noises in the ears** (tinnitus) this may be caused by anaemia, fever or poor hearing.

- If the noise is in time with the heart beat, the tinnitus is usually caused by anaemia or fever. Anaemia and fever make the blood go through the ears faster than normal.
- If the noise is constant, and not in time with the heart beat, the tinnitus is caused by poor hearing, for example: from wax blocking the ear. (Please read the demonstration on page 234).
- However, if there is no wax in the ear and one sided deafness persists they may need to see an ear doctor.

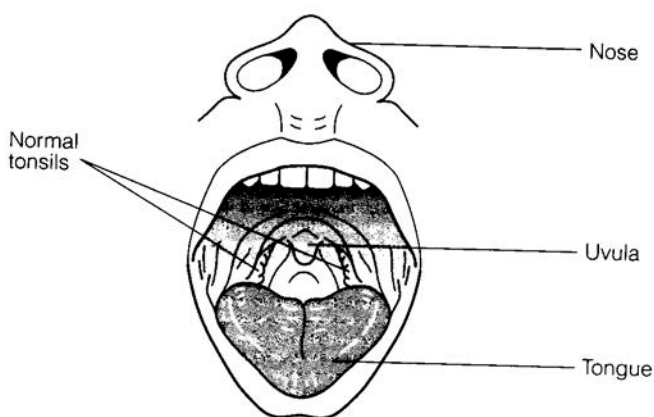
Throat pain (a sore throat)

If a patient has pain in his throat, take a history and look at the back of the throat. Do not put anything into the throat. If the patient is a young child, the best time to look at the throat is when they are crying.

Ask an older patient to:

- look towards the window
- look upwards a little
- open his mouth and say 'gaaaaaaaaa'.

POSTER 2: Throat pain and the FeverPAIN score
(Prepared poster) Draw Picture 31 on Poster 2.



PICTURE 31 The throat

FeverPAIN score (1 point for each of the following)
Fever in the previous 24 hours
Pus on the tonsils
Attends within 3 days
Inflamed tonsils
No cough or runny nose
<i>If the total score is 4 or 5 treat for bacterial tonsillitis</i>

Show Poster 2 to the students and explain that: Pain in the throat can be caused by tonsillitis, diphtheria or epiglottitis. The tonsils are found to either the side of the back of the tongue. The pharynx is the space behind the nose and throat. Pharyngitis and tonsillitis are often caused by the same infection.

- **Tonsillitis** is an infection of the tonsils. Tonsillitis is caused by a virus or bacteria. It is difficult to know which type of tonsillitis a patient has. Normal tonsils are often big and often have white areas in the cracks. Group A Streptococcus is a bacterial infection that causes a painful red throat, fever and tiredness. This normally only lasts 3-5 days. But occasionally, if untreated, Group A Streptococcus can make children (especially aged 5-15) unwell with scarlet fever, acute rheumatic fever or other complications. If a child has a FeverPAIN score of 4 or 5 treat for Group A Streptococcus. Consider only treating people over 15 with antibiotics if they are unwell or getting worse after 2-3 days.
- **Epiglottitis** is an infection of the epiglottis. The epiglottis is a piece of gristle behind the tongue, which prevents food and drink from going into the lungs. Severe epiglottitis stops air from going into the lungs. This can be fatal (cause death).
- **Diphtheria** is an infection caused by diphtheria bacteria. Diphtheria can damage the heart and nerves.

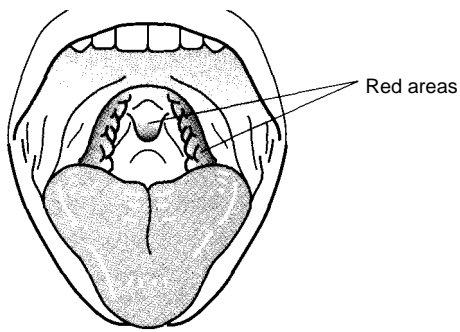
How to diagnose the cause of a painful throat

POSTER 3: Draw Pictures 32, 33 and 34 on Poster 3.
(Prepared poster) Explain Poster 3 to the students. Explain how to make a diagnosis in a patient with a painful throat:

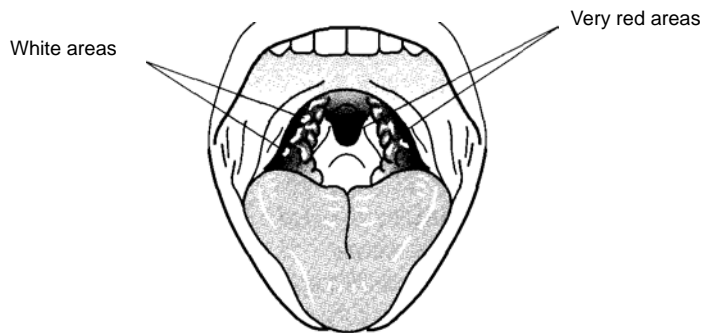
LESSON 14 Ear, nose and throat problems

If the patient has a painful throat:

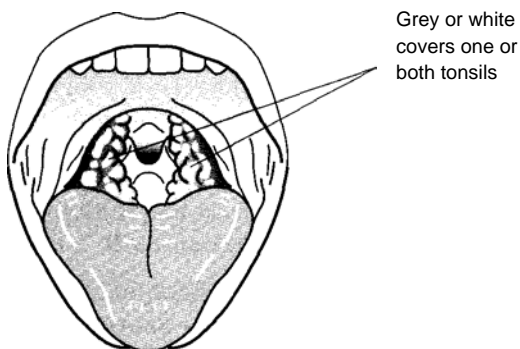
- and is **not able to drink**, diagnose **epiglottitis**
- and the throat is more red than usual but the **FeverPAIN score is 3 or less**, diagnose **tonsillitis caused by a virus**.
- and the FeverPAIN score is 4 or 5, diagnose tonsillitis caused by bacteria (Group A Streptococcus).
- and there are **white or grey areas** which cover the tonsils, but the throat is only **slightly red**, diagnose **diphtheria**.



PICTURE 32 Tonsillitis caused by a virus



PICTURE 33 Tonsillitis caused by bacteria



PICTURE 34 Diphtheria in the throat

Throat pain stories **POSTER 4:** (Summary poster)

Summarise the treatment for each throat problem below on Poster 4 as you teach.

Tonsillitis caused by a virus

Husseini is 6 years old. He has had a painful throat and a fever for 2 days. He also has a cough and a fever. He is able to drink, is not anaemic and does not have fast breathing. You ask Husseini to look towards the window, look up a little and to open his mouth and say 'gaaaaa'. Husseini's throat is more red than usual. There are no areas of white on the tonsils, but the tonsils look very big. Husseini's FeverPAIN score is 3. Husseini has tonsillitis caused by a virus.

Treatment: Tell Husseini's carer to **feed** him **five times a day** until 1 week after he is better. Test Husseini for malaria. Ask his carer to **bring** Husseini **back** to the health centre **if** he is **no better after 3 days**.

Tonsillitis caused by bacteria

Juma is an 8-year-old boy with fever and pain in his throat. His throat is very red. There are white areas in the cracks of his tonsils. Juma is able to drink. Juma's feverPAIN score is 4. Juma has tonsillitis caused by a bacterial infection.

Treatment: Give Juma **phenoxymethylpenicillin** 250 mg three times a day for 10 days. Juma is not allergic to penicillin. (He weighs more than 20 kg but less than 40 kg.) Ask Juma's carer to bring him **back after 3 days if** he is **no better**. Test for malaria in malaria areas.

If Juma is allergic to penicillin (a widespread itchy rash, or a sudden onset of severe fainting triggered by penicillin) then avoid penicillin - azithromycin is an alternative (500 mg daily for 3 days).

Diphtheria

Amina is a 2-year-old girl who is unwell and has a painful throat. Amina was not given her immunisations. Amina has a fever but she is not anaemic and she does not have fast breathing. You look inside Amina's mouth when she coughs or cries. You can see large areas of **white or grey** on her throat. The white **areas cover both tonsils**. The throat is only **slightly red**. Amina's mouth smells bad. Amina has diphtheria.

Treatment: Give Amina an intramuscular injection of **benzylpenicillin** (0.1 million IU for each kg of body weight up to 2 million IU) and **send** her immediately **to hospital**. Diphtheria is a serious infection that is difficult to treat and can sometimes block the airway. If the patient survives the initial throat infection, one or several weeks later a dangerous toxin from the infection can cause heart damage or neurological symptoms. The antitoxin is not available in many areas. Preventing diphtheria with vaccination is important and the public health department should be told about every patient affected.

Epiglottitis

Hassan, a 3-year-old boy, has been ill since yesterday. He has a fever and is not able to eat or drink. He is leaning forward and has a lot of saliva coming out of his mouth. Hassan has epiglottitis. **Do not look** at Hassan's **throat**. Examining the throat can cause the airway to close.

Treatment: Give Hassan an intramuscular injection of **ceftriaxone** (50 mg for each kg of body weight up to 1000 mg) or **benzylpenicillin** and **send** him **immediately to hospital**.

Mouth pain POSTER 5: (Summary poster)

Summarise the treatment for each cause of mouth pain below on Poster 4 as you teach.

Tooth abscess If a patient has pain in the mouth press on the teeth: If one of the teeth is painful when you touch it, treat the patient for a **tooth abscess**. A tooth abscess can be caused by tooth decay. Tooth decay happens if a person does not brush his teeth twice a day and does not eat a good mixed diet. Treat a tooth abscess with **metronidazole** 200 mg three times a day for 5 days or **phenoxymethylpenicillin**, (or amoxicillin), at the normal dose, for 5 days. Send the patient to see a **dentist**.

Gingivitis / mouth ulcer / herpes stomatitis

Look at the gums: If the gums are painful, or blood comes from the gums, the patient may have gingivitis or a mouth ulcer (or perhaps even herpes stomatitis). Gingivitis and mouth ulcers are caused by, or made worse by, a bad diet and not brushing and flossing the teeth. (See below for how to make a toothbrush.)

- If there are multiple shallow ulcers throughout the mouth (see the photo to the right), the patient probably has herpes stomatitis. This is usually a first attack of the cold sore virus herpes type 1. Either no treatment is needed, or if aciclovir tablets are available, aciclovir can help the sores get better slightly sooner.
- Advise the patient to eat a mixed diet (avoiding sugars) and to brush their teeth and to wash out their mouth with clean salted water twice a day. They should not use sea water.



Herpes stomatitis

Making a toothbrush

Ask one of the students to show the class how to make a toothbrush. Make a toothbrush from soft wood, for example the stalk of a banana tree. Use a knife to cut away the outer parts of the stalk. Next, bite the end of the stick until you produce a soft brush. Brush the teeth every morning and night. Use fluoride toothpaste, but if this is not available baking powder will help. Charcoal and salt are probably too abrasive to use regularly as toothpaste.

Oral candida

One cause of pain in the mouth is made more common by: HIV; malnutrition; or antibiotics. Ask the students what this problem is and what it looks like. Look for the following answers:

Answer Oral candida. This is sometimes called **thrush**.

Answer You will see **white areas on top of painful red areas** inside the mouth.

Answer This is sometimes linked with pain and difficulty swallowing - **oesophageal candida**.



Oral candida (thrush)
made more common
by HIV

LESSON 14 Ear, nose and throat problems

Next, ask your students:

What is the treatment for oral and oesophageal candida? Look for the following answers:

Answer For oesophageal candida (with or without oral candida) use fluconazole 150mg each day for 3 weeks and review.

Answer For oral candida: Fluconazole 50mg daily for 7 days (or 150mg on day 1 and day 4). If fluconazole is not available: give the patient 100,000 units nystatin, after food, four times a day for 7 days.

The patient should rinse the mouth with the nystatin liquid and then swallow the nystatin.

SECTION 3: When to refer patients to hospital

Give each student a copy of Tables 1 to 4.

TABLE 1 Ear problems

Ear problem	Treatment
Green or yellow discharge from the ear no better 7 days after starting co-trimoxazole or amoxicillin	Send to ear, nose and throat clinic
Foreign body in the ear and discharge from the ear	Send to ear, nose and throat clinic
Foreign body in the ear that cannot be removed using a syringe and water	Send to ear, nose and throat clinic
Mastoiditis or cellulitis	Procaine penicillin fortified or benzyl-penicillin and send to hospital

TABLE 2 Throat problems

Throat problem	Treatment
Diphtheria	Give an injection of benzylpenicillin. Send immediately to hospital.
Epiglottitis	Do not look at throat. Given injection of ceftriaxone or benzylpenicillin. Send immediately to hospital.

TABLE 3 Mouth problems

Mouth problem	Treatment
Oral candida	Nystatin for 7 days. Advise about HIV and send to an HIV counselling and testing centre
Tooth abscess	Metronidazole 200 mg three times a day for 5 days or phenoxymethylpenicillin for 5 days. Send to a dentist.

TABLE 4 Nose problems

Nose problem	Treatment
Blood coming from the nose. Patient feels light-headed and the pulse is faster than 110 beats in one minute.	Press the soft part of the nose on both sides continuously. Lean forward. Give oral rehydration solution 5 ml every minute. Send hospital to immediately.
If there is still blood coming from the nose one hour after you started to treat the patient.	Send to hospital. He should see an ear nose and throat doctor if possible.
Foreign body in the nose has not come out after he has blown hard through his nose 10 times.	Send to hospital. He should see an ear nose and throat doctor if possible.

Refreshment break

SECTION 4: Practical

Blood coming from the nose

Demonstration 1:

Ask one student to play the part of a 50 year old woman called Damu. Ask the second student to play the doctor. Damu has blood coming from her nose. Tell the student who is playing the part of the doctor to do the following things to help Damu as you read them out:

1. Gently press the soft part of the nose on both sides for 10 minutes. Bleeding usually comes from near the front of the nose.
2. Lean Damu forward to stop blood going down the back of the throat.
3. Put something between her teeth, a pen for example, to stop her swallowing blood. This will also help the blood to clot in the nose. If there is still bleeding 1 hour after starting treatment, send the patient to hospital, to see and ear, nose and throat doctor is possible.
4. Count how many times the pulse beats in one minute. If the patient has lost a large amount of blood, feels light-headed and her pulse beats 110 or more times in 1 minute, she is ill with shock. Give her oral rehydration solution, 5ml every minute. Send to hospital.
5. Measure the blood pressure. High blood pressure sometimes causes blood to come from the nose. If the patient's blood pressure is 180 mmHg or more, send the patient to hospital immediately.
6. If the patient does not need to go to hospital and the bleeding stops, put some vaseline inside the nose 2 hours after blood has stopped coming out. Tell the patient to put vaseline inside the nose two times a day for 5 days. This will help the nose to heal.

Foreign body in the nose

DEMONSTRATION 2:

Ask one student to play the patient, a 4-year-old boy called Fadhil.

Ask another student to play the part of the doctor.

For the last 2 days, pus has come out of Fadhil's left nostril.

Tell the student who is playing the part of the doctor to do the following things to help Fadhil as you read them out:

1. The doctor wipes the nose. She looks up the nose. There is something hard in the left nostril.
2. Next, the doctor presses firmly on the soft part of the nostril which does not have a foreign body in it.
3. Place a cloth over the end of Fadhil's nose. Ask him to close his mouth and to blow hard through his nose.
4. If the foreign body has not come out after blowing the nose 10 times, send the patient to hospital, to see an ear, nose and throat doctor if possible. See appendix 29 for a technique to use if you have an ear torch (an otoscope/ auroscope).

Foreign body in the ear

- If a patient has something in his ear and there is pus coming out of the ear, send him to the ear, nose and throat clinic.
- If there is no pus, use a syringe and soapy water to wash the foreign body out.

DEMONSTRATION 3:

You need a syringe (5 ml or larger), a cup of water, some soap, a bowl and a towel or cloth. Ask one student play a doctor and another student to play a girl called Sita. Sita has something in her ear. There is no pus coming from her ear. Tell the student who is playing the part of the doctor to do the following things to help Sita as you read them out:

1. Put a towel or a cloth on the patient's shoulder. Put a bowl underneath the ear.
2. Put some warm soapy water in a cup.
3. Fill a syringe with warm soapy water.
4. Put the end of the syringe into the top of the ear hole. Push the syringe so that water comes out very quickly.
5. Do this several times until the foreign body has come out of the ear.
6. If the foreign body will not come out of the ear, send the patient to the ear, nose and throat clinic. See appendix 29 for a technique to use if you have an ear torch (an otoscope/ auroscope).

Wax blocking the ear

Wax which has been pushed against the eardrum may cause poor hearing. If a patient has poor hearing and there is no pus in the ear, treat the patient for ear wax. The following demonstration shows you how to treat ear wax.

DEMONSTRATION 4:

Ask one student to play a doctor and another student to play a patient called Thomas. Thomas has been having problems hearing recently. There is no pus coming from his ear. Tell the student who is playing the part of the doctor to do the following things to help Thomas as you read them out:

LESSON 14 Ear, nose and throat problems

1. Advise the patient not to clean the ear with a stick. Explain that trying to clean the ear with a stick may cause permanent deafness.
2. Put three drops of liquid vegetable oil into the ear twice a day for five days. Vegetable oil, such as olive oil, makes the wax soft. When the wax is soft it is easier to remove. Often the wax and dirt will come out with no other treatment. An alternative is sodium bicarbonate ear drops (1 teaspoon of bicarbonate of soda (or baking soda) dissolved in 1/2 a cup of clean water - at room temperature.)
3. If after 2 weeks the patient still has poor hearing he should come back to the health centre. Use a syringe and soapy water to clean the ear.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. *A patient has a fever and a yellow or green discharge from his ear. How do you treat him?*

Give him co-trimoxazole for 5 days in malaria areas. Or give amoxicillin if the patient is pregnant or there is no malaria in your area.

If the discharge is no better 1 week after starting treatment, send the patient to the ear, nose and throat clinic.

2. *What are the symptoms of diphtheria? How do you treat diphtheria?*

The throat is painful. There are white or grey areas which cover the tonsils, but the throat is only slightly red.

Give an intramuscular injection of benzylpenicillin and send immediately to hospital.

3. *What are the symptoms of epiglottitis? How do you treat epiglottitis?*

The throat is painful. The patient is not able to drink. Do not examine the throat. Give an intramuscular injection of ceftriaxone or benzylpenicillin. Send the patient to hospital immediately.

Lesson 15 Eye problems

BEFORE THE LESSON

- There are three posters in this lesson. (See p. 4 for information on how to use the posters.)

Prepared posters: 1, 2, 3

- Ask student to look at Appendix 21, How to treat an eye problem, before the lesson.
- You need some thin sticks, thin cardboard, pins and scissors for the practicals in section 3.
- Draw or print large copies of Pictures 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49 and 51 of twelve eye problems. Do not label the front of the pictures. You may wish to label the back of the pictures to remind you which picture is which. Give these pictures to students for the practical in section 4. The different types of conjunctivitis look very similar. Obviously bacterial conjunctivitis causes more pus. Allergy or trachoma, gonococcal conjunctivitis and chlamydia are diagnosed using appendix 21 the story is different. Students would be correct to hold up picture 42 for all of these problems.

Lesson plan

1 Quiz

2 Information about the eyes

3 How to examine the eyes

4 Diagnosis and management

5 When to send patients to hospital

6 Answers to the quiz

SECTION 1: Quiz

POSTER 1:

(Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. A 2-week-old baby has had pus coming out of both eyes for 2 days. What could cause this?
2. Name three causes of pain in the eye.
3. Name three causes of poor eyesight when the eye is not red.
4. A patient has a red eye which is painful. Her eyesight in that eye is worse than normal. How will you treat her?
5. What eye conditions can be linked with each of the following health problems? HIV; Diabetes; High blood pressure; Cerebral malaria; Old age.

SECTION 2: Information about the eyes

In Low and Middle Income Countries, most types of blindness can be prevented or cured. For example, we can prevent blindness caused by lack of vitamin A deficiency and we can treat cataracts. Today you will learn how to identify and treat common and important eye problems.

If you know what a healthy eye looks like, you will know when the patient has an eye problem.

POSTER 2:

(Prepared poster)

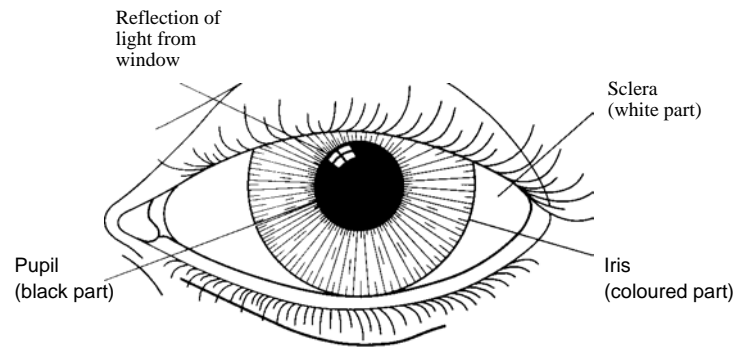
The front of a normal eye

Draw Picture 35 on Poster 2.

Point to each part of the eye and explain how it works.

- **Eyelids** close to prevent the eye from becoming dry.
- The **conjunctiva** is a clear wet skin that covers the white part of the eye the inside of the eyelids.

LESSON 15 Eye problems

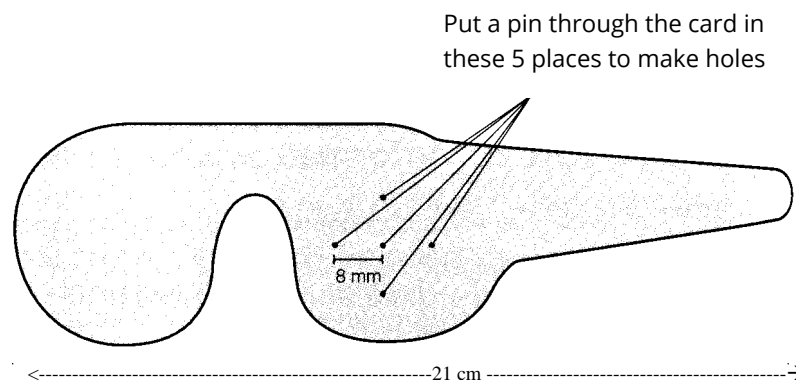


PICTURE 35 *The front of a normal eye*

- The black **pupil** gets bigger at night to let in more light. The coloured **iris** is a circle of muscle that changes size to make the black pupil bigger.
- Behind the black pupil is a clear piece of jelly called the lens. The lens allows us to see both things that are near to us and things that are far away from us.
- The **cornea** is the window of the eye in front of the black pupil and coloured iris.

SECTION 3: Practical: How to examine the eye

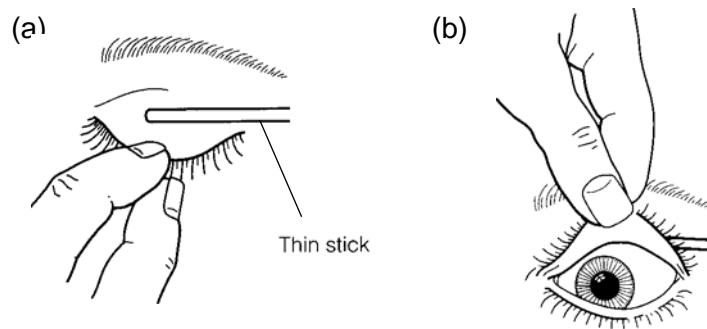
Show students how to make a multiple pin-hole occluder. You will need a thin piece of cardboard, several small pins, several pairs of scissors. Copy picture 36 of an occluder with five pin-holes. Make the occluder 21 cm long and the pin-holes approximately 8 mm apart in a cross.



PICTURE 36 *Multiple pin-hole occluder*

Ask a student volunteer to stand with you at the front of the class. Examine the volunteer's eye as shown in Picture 37. Slowly show the other students how to examine the eye. Explain how to examine the eye.

1. The patient should sit facing a window.
2. Look at the eyelids. (See picture 37 - below.)
 - Put a finger on the lower eyelid and gently pull it down. Look at the inside of the eyelid.
 - If the patient has pain in the eye, also look under the upper eyelid. Put a thin stick on the upper eyelid. Hold the stick with your left hand to examine the right eye. With the fingers of your other hand gently pull the eyelashes down. Ask the patient to look down. Lift the eyelid so that it folds over the stick. Wipe the inside of the eyelid with a clean soft cloth or cotton wool.



PICTURE 37 *How to examine the upper eyelid*

3. Look at the white part of the eye.

- Is it the normal colour?
- Is the white part of the eye more red than usual?
- Is the area next to the cornea most red?

4. Look at the cornea and the iris. In a healthy eye, the cornea is clear with no marks on it and you can see the iris clearly. If the eye is painful, or may have been scratched, use fluorescein paper to stain for ulcers or abrasions (scratches).

5. Look at the pupil. Normal pupils are black and the same size.

6. Finally, ask the patient if his eyesight, **in that eye**, is worse than usual. Put the pin-holes of the occluder directly in front of the bad eye. Cover the good eye completely. Ask the patient if he can see better, or read better, through the little holes. If the patient is a child, ask the patient to pick up a small object, whilst the good eye is shut or covered. This will show you both that the bad eye can still see clearly, or not.

Ask the students to sit together in pairs and to practise examining each other's eyes. Give one stick each to two students. Observe them and make sure they know how to do this correctly.

If after examining a patient's eyes you still do not know why a patient has poor eyesight:

1. look for a fever
2. look for anaemia
3. measure the blood pressure
4. test a urine sample for glucose (to see if the patient has diabetes). You may need to send the patient to hospital for this test.

Fever, anaemia, high blood pressure or diabetes may cause poor eyesight.

SECTION 4: Diagnosis and management

Symptoms and signs

Ask the students to look at Appendix 21. "How to treat an eye problem."
Explain how to use Appendix 21:

Column 1 of Appendix 21 tells you about the four types of eye problems:

1. red eye or eyes
2. poor eyesight when the eye is not red
3. swelling next to the eye.
4. yellow growth to the side of the cornea

You use column 1 of Appendix 21 to decide which type of eye problem your patient has.

Column 2 tells you the questions you need to ask to find out about the main symptoms and signs of the eye problem. If the answer to *any* question in column 2 is 'yes', look at the group diagnosis in column 3.

Next, look for the other symptoms and signs for that group diagnosis in column 4. When you find the symptom or sign that your patient has, you can make a full diagnosis.

The treatment for each diagnosis is described in column 5.

Tell the students that they will now use Appendix 21 to identify 20 eye problems in the following examples.

Give the pictures of eye problems to 12 of your students. Explain that each picture shows a different eye problem.

Next, tell the students that you will describe 12 patients with symptoms and signs of different eye problems. The students should use Appendix 21 to decide which eye problem each patient has. If a student thinks that her picture shows that eye problem, she will stand up and tell the class why her picture shows that eye problem. Tell the students that it does not matter if they get it wrong.

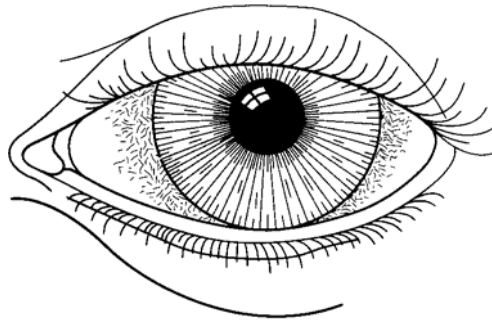
Appendix 21 also teaches about pinguecula and pterygium. These are yellow growths to the side of the cornea.

Red eye

Group diagnosis 1: *Eye problem 1: Iritis*

Painful red eye

Amina is a 30-year-old woman. She has had pain in her left eye since yesterday. Amina does not have any other illness. Amina's eyelids are normal. The white part of the eye is more red than usual. The white part of the eye next to the cornea is very red. The cornea looks cloudy. The left pupil is smaller than the right pupil. Amina tells you she *cannot* see well with her left eye. Amina has iritis. Iritis is caused by inflammation, but not an infection. Amina's symptoms and signs could also be caused by a corneal ulcer.

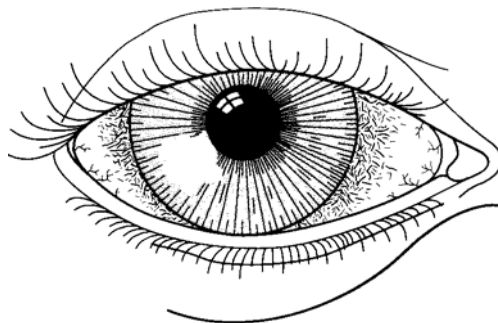


PICTURE 38 Eye problem 1: iritis

Ask the students: 'Does your picture show iritis? Why?'

Treatment: Put antibiotic eye ointment (or a drop) in the eye.
(The correct treatment for iritis are atropine eye drops and steroid eye drops.)
Send Amina to hospital immediately.
If the patient is a child less than 6 years old, give vitamin A.
It is worth testing for HIV and syphilis in patients with uveitis.

Group diagnosis 1: Eye problem 2: Corneal ulcer
Painful red eye



PICTURE 39 Eye problem 2. corneal ulcer

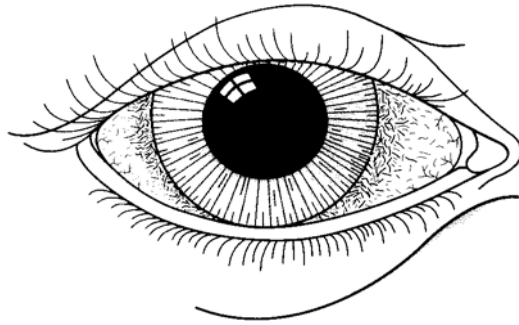
Maulidi is a 52-year-old man. He has had pain and a large amount of water coming out of his right eye for 3 days. Maulidi does not have any other illness. His eyelids look normal. The white part of the eye next to the cornea is very red. There is a mark on the cornea. The pupil is black. Maulidi tells you he cannot see well with his right eye. Maulidi has a corneal ulcer. (If you have fluorescein stain put some inside the lower eyelid and ask the patient blink.) Corneal ulcers can be made more common by HIV. Test for HIV if the ulcer looks like a herpes ulcer, or if the patient has herpes zoster. (Treat herpetic ulcers with aciclovir 400mg five times a day for 7 days.)

Ask the students: 'Does your picture show a corneal ulcer? Why?'

Treatment: Put antibiotic eye ointment (or a drop) in the right eye. Next, send Maulidi to hospital immediately. Corneal ulcers may be caused by herpes virus, bacteria or fungus infections, or by lack of vitamin A. Give vitamin A if a patient is less than 6 years old or might have malnutrition. If the patient has a recent simple scratch on the cornea, and no story of a fast moving object

going in the eye, eye ointment twice a day for 2-3 days will heal most scratches. If not they should go to an eye clinic.

Group diagnosis 1: Eye problem 3: Acute glaucoma
Painful red eye



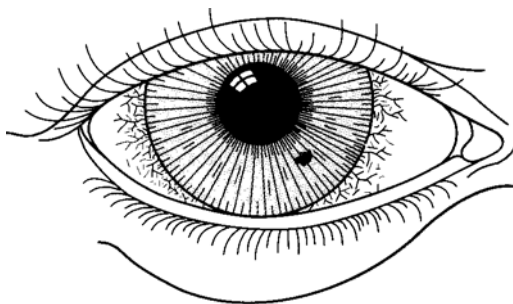
PICTURE 40 Eye problem 3: acute glaucoma

Mosi is a 50-year-old woman. Her right eye is red. Mosi has had severe pain in her right eye for 2 hours. She does not have any other illness. The eyelids are normal. The white part of the eye next to the cornea is very red. There is a large amount of water coming out of the eye. The cornea is not clear. The right pupil is bigger than the left pupil. The pupil is not black because the cornea is not clear. Mosi cannot see well with the right eye. Mosi has acute glaucoma. The eyeball will be hard in acute glaucoma (ask the patient to look down and press on the eyeball through the upper eyelid). A corneal ulcer can cause the same symptoms and signs and both problems need expert care.

Ask the students: 'Does your picture show acute glaucoma? Why?'

Treatment: Put antibiotic eye ointment (or a drop) in the right eye. (The correct treatment for acute glaucoma is acetazolamide.) Send Mosi to the eye hospital immediately. Give vitamin A if a patient is less than 6 years old or might have malnutrition.

Group diagnosis 1: Eye problem 4: Corneal foreign body or a corneal abrasion
Painful red eye



PICTURE 41 Eye problem 4: corneal foreign body

Eye problems LESSON 15

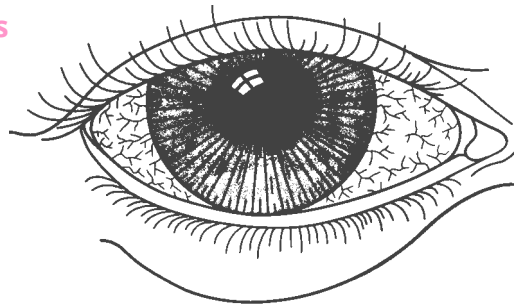
Hassan is a 32-year-old man. Yesterday, he felt something go into his right eye. Hassan was not able to sleep because of pain. Hassan does not have any other illness. The insides of the eyelids are normal. The white part of the eye next to the cornea is red. There is a large amount of water coming out of the eye. You can see a small black object on the cornea. The pupil is black. Hassan says that he can see well with his right eye, but that it is difficult to keep the eye open. Hassan has a foreign body in his cornea or a corneal abrasion.

Ask the students: 'Does your picture show a corneal foreign body? Why?'

Treatment: Try to wash the foreign body out of the eye with clean water. Wipe the inside of the upper eyelid. Put tetracycline eye ointment in the eye. If the eye is still painful, send the patient to an eye hospital immediately. If you have local anaesthetic drops and appropriate training, foreign bodies on the surface of the cornea can be easily removed. Perhaps with a cotton bud or a sterile needle. Then use antibiotic eye ointment and an eye pad for a day or two.

Some foreign bodies go fast enough to go inside the eye. If the patient was using a hammer or chisel, or cannot see well following an accident, or there is blood behind the cornea, send him to an eye hospital immediately. Injury to the cornea or other parts of the eye is a common cause of scarring and possible blindness. If the patient can't get to an eye doctor that day: give them ciprofloxacin 750mg twice a day; an antibiotic eye drop; and an eye pad can be used until they get to the eye doctor.

Group diagnosis 2: Eye problem 5: Viral conjunctivitis
Irritated red eye.
No pain. Eyesight is normal



PICTURE 42 Eye problem 5: viral conjunctivitis

Two children, Ali aged 3 years and Saidi aged 5 years, have runny noses and irritated eyes. Ali and Saidi do not have any other illness. In both children, the inside of the eyelids are very red. The white part of the eye is more red than usual. The cornea is clear. The pupil is black. Saidi and Ali are able to pick up a pen easily. Ali and Saidi have viral conjunctivitis. With viral conjunctivitis, there is little or no pus and the eyes are red for less than 7 days. Measles is a virus that can cause conjunctivitis. Suspect measles if a child has an upper respiratory tract infection together with conjunctivitis.

Ask the students: 'Does your picture show viral conjunctivitis? Why?'

Treatment: Tell the patients (or the carer) to wash their faces and hands three or four times a day. Each child should not use the same towel as anyone else. Tell the carer to bring the children back if their eyes are no better after 7 days.

A patient with measles has a rash on his body and a fever. If you think a child may have measles, treat him with vitamin A. Vitamin A prevents serious eye problems and death in children. Give the first dose of vitamin A at the health centre. If a child has a fever and there is malaria in the area, test for malaria.

Another condition that causes red conjunctivae and fever is leptospirosis (a bacterial infection that can cause serious sepsis). This is more common after heavy rain or flooding, especially after contact with water or moist soil to the eyes, mouth or open sores. If you suspect leptospirosis treat with doxycycline twice a day for 7 days (not for pregnant women).

Group diagnosis 2: Eye problem 6: Bacterial conjunctivitis

Irritated red eye.

No pain. Eyesight is normal

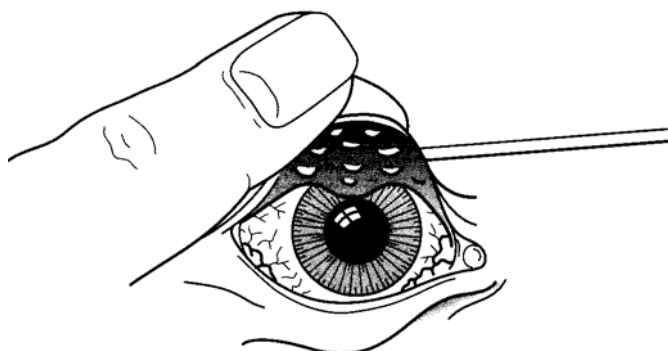
Conjunctivitis may also be caused by bacterial infection. A patient has bacterial conjunctivitis if there is a large amount of pus in the eye and the eye has been red for less than 7 days.

Treatment: Give an antibiotic eye ointment two times a day for 5 days. Tell the patient to go to the eye hospital if he is no better after 3 days.

Group diagnosis 2: Eye problem 7: Trachoma or allergic conjunctivitis

Irritated red eye.

No pain. Eyesight is normal



PICTURE 43 Eye problem 7: trachoma or allergic conjunctivitis

Asha is 11 years old. Both of her eyes are red and irritated. Ten days ago, Asha was given tetracycline eye ointment. Asha does not have any other illness. You turn Asha's top eyelids inside out. There are many small swellings on the inside of the eyelids. The white part of the eye is more red than usual. There is a small amount of pus in her eyes. The cornea is clear. The pupil is black. Asha tells you that she can see well.

Asha may have conjunctivitis caused by trachoma or an allergy to the eye ointment. If conjunctivitis is no better 7 days after starting eye ointment, it may be caused by an allergy to eye ointment. Stop the eye ointment. If the eyes are very itchy consider an oral antihistamine such as cetirizine or loratadine (10 mg once a day, 5 mg a day for children under 5) for a day or two.

If conjunctivitis is no better 3 days after stopping eye ointment, it could be caused by trachoma. Trachoma is passed from person to person on dirty fingers or by flies. In most countries Trachoma is fairly rare. Trachoma is a different type of chlamydia infection. Trachoma is not sexually transmitted but can be treated with similar treatment.

It causes mild conjunctivitis which continues for a long time. If a patient has many trachoma infections over many years, trachoma can scar the eyelids. These scars may cause the eyelids to bend and to rub against the cornea. If the cornea is damaged it will become scarred and white. Corneal scarring causes blindness.

Ask the students 'Does your picture show trachoma or allergic conjunctivitis? Why?'

Treatment: Tell Asha to stop using the eye ointment, she may have allergic conjunctivitis. Tell her to come back if she is no better after 3 days. Allergic conjunctivitis will improve during those 3 days. If there is no improvement 3 days after stopping the ointment then diagnose Trachoma.

Trachoma is treated with either azithromycin 1g as a single dose by mouth (if the patient weighs more than 45kg). Alternatively give 20mg/kg azithromycin for 3 days. (Alternatively give tetracycline eye ointment twice a day for at least 6 weeks). Normally an eye nurse or doctor will start this treatment. Washing the face and eyes two times a day can prevent trachoma. Using latrines and burying rubbish will reduce the number of flies. There is no treatment for corneal scarring.

Group diagnosis 2: Eye problem 8: Gonococcal conjunctivitis

**Irritated red eye.
No pain. Eyesight is normal**

Pili was born less than 5 days ago. Pili has a large amount of pus coming out of both eyes. Her eyelids are swollen. Pili does not have any other illness. The inside of the eyelids are very red. The white parts of the eyes are more red than usual. The corneas are clear. The pupils are black. Pili has gonococcal conjunctivitis.

Treatment: Put antibiotic eye drops in both eyes six times a day for 5 days (or antibiotic ointment in two times a day). Give Pili the first-line treatment for gonorrhoea (ceftriaxone 50mg/kg into a thigh muscle on one occasion), or intramuscular injections of procaine penicillin fortified once a day, or intramuscular benzylpenicillin two times each day, for 5 days. Tell the mother that Pili was infected with gonococcal conjunctivitis during birth. This can happen to a baby if the carer has gonorrhoea. Tell the parents that they have gonorrhoea, which is a sexually transmitted disease. Send the mother and father to a clinic that treats sexually transmitted diseases.



Conjunctivitis
Caused by
gonorrhoea or
chlamydia

Group diagnosis 2:
Irritated red eye.
No pain. Eyesight is normal

Eye problem 9: Chlamydia conjunctivitis

If a baby is more than 5 days old but less than 1 month old and has pus coming out of the eyes, the baby may have chlamydia conjunctivitis. A baby is infected with chlamydia conjunctivitis during birth if the mother has chlamydia infection.

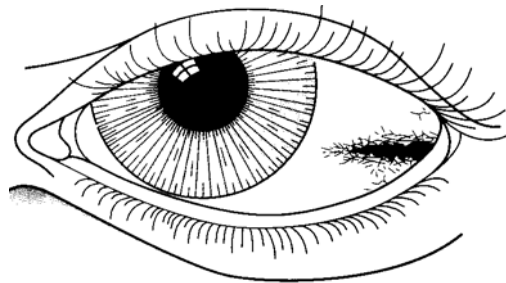
Ask the students 'Does your picture show conjunctivitis which could be caused by gonorrhoea or chlamydia? Why?' The correct picture is the picture of viral conjunctivitis but there must also be pus in the eyes for gonococcal or chlamydia conjunctivitis.

Treatment: Put tetracycline ointment in the eyes once a day for 3 weeks. Also give the baby erythromycin (liquid or crushed tablets) 10 mg for each kg of body weight, four times a day for 14 days. (An alternative is azithromycin 20mg/kg for 3 days) Tell the parents that they may have chlamydia, and send them to a clinic that treats sexually transmitted diseases.

(In many countries gonococcal and chlamydia conjunctivitis of newborn babies can be prevented by a drop of 2.5% povidone-iodine solution given to both eyes immediately after birth and repeated later that day.)

Group diagnosis 3:
Red eye. No irritation.
No pain. Eyesight is normal

Eye problem 10: Sub-conjunctival haemorrhage



PICTURE 44 Eye problem 10: sub-conjunctival haemorrhage

Tracey has just given birth. There is a small collection of blood in the white part of Tracey's left eye. Her eye is not painful. Tracey does not have any other illness. The insides of the eyelids are normal. The cornea is clear. The pupil is black. Tracey is able to see well with her left eye. Her blood pressure is normal. Tracey has a sub-conjunctival haemorrhage. Small accidents, coughing, giving birth, or high blood pressure may cause a small amount of blood to collect under the conjunctiva in front of the white part of the eye.

Ask the students 'Does your picture show a sub-conjunctival haemorrhage. Why?'

Treatment: Tell the patient that the sub-conjunctival haemorrhage will go away after 2 or 3 weeks. Do not give any medicine.

Refreshment break

Group diagnosis 4: Eye problem 11: Needs glasses or hand lens
Needs glasses or hand lens

Salim, a 50-year-old teacher, has found it difficult to read his books for the last 2 years. Salim does not have any other illness. The eyelids and the white part of the eye are normal. The cornea is clear. The pupil is black. You ask Salim to look at a book through multiple pin-holes in daylight. Salim tells you that he can read through the pin-holes. The lenses in Salim's eyes are old. Salim needs glasses or a hand lens to help him to read.

Treatment: Refer Salim to the eye clinic where he may be able to get glasses. By the time people are 50 they will often need reading glasses that are +1 to +2 dioptres. By the age of 70 they may need glasses that are +3 to +4 dioptres to read with.

Group diagnosis 5: Eye problem 12: Cross-eyed
Cross-eyed

Window reflections are in DIFFERENT positions related to pupils)



PICTURE 45 Eye problem 12: cross-eyes

Abduli is a 3-year-old boy. His eyes always look in different directions. Abduli does not have any other illness. The eyelids and the white parts of the eyes are normal. The corneas are clear. The pupils are black. Abduli is able to pick up a pen if you cover the left or the right eye.

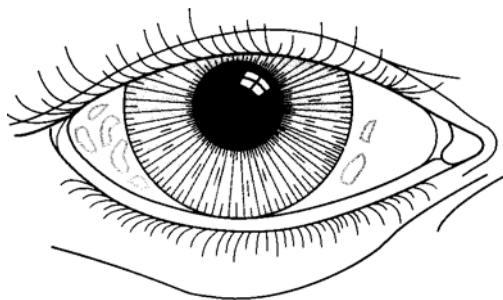
Do the light reflection test. Abduli looks towards the window. You look at the reflections of the window on Abduli's corneas. You compare the positions of the reflections on Abduli's corneas with the position of the pupils. You decide that Abduli is cross-eyed, because the reflections on his corneas are in different places.

Treatment: Send Abduli to the eye clinic.

Group diagnosis 6: Eye problem 13: Sudden visual loss.
Sudden visual loss

Check the blood pressure and dip urine for glucose. Refer to the eye clinic immediately. This may be a Central Retinal Venous Occlusion. Management of high blood pressure and diabetes is important.

Group diagnosis 7: Eye problem 14: Lack of vitamin A
Poor eyesight at night



PICTURE 46 Eye problem 13: Lack of vitamin A

Siti is a 4-year-old girl. She cannot see well at night and often has accidents when it is dark. Siti does not have any other illness. The eyelids and the white parts of the eyes are normal. The corneas are clear. There are dry areas on the corneas. The pupils are black. You give Siti your pen. Siti is able to pick up your pen. Siti's brother Usiku is 5 years old. He has little bubbles on either side of the cornea. These are called Bitot's spots. Siti and Usiku both have night blindness. This is caused by a lack of vitamin A.

Ask the students: 'Does your picture show lack of vitamin A? Why?' Ask the student who has a picture of a normal eye to stand up also.

Tell the students that it takes some time for lack of vitamin A to affect the eyes. If the patient has early vitamin A deficiency, the eye will look normal except for dry areas on the cornea. It is important to look carefully at the cornea if you think a patient may lack vitamin A.

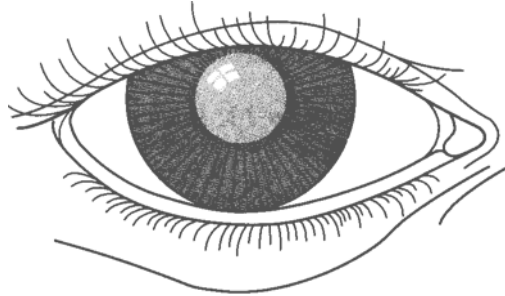
Treatment: Give Siti and Usiku three doses of vitamin A:

- Give the first dose today.
- Give the second dose tomorrow.
- Give the third dose on day 14.

For children aged less than 1 year, give three doses of 100,000 IU by mouth. For children aged more than one year, give three doses of 200,000 IU by mouth.

Tell the carer about foods that contain vitamin A. Explain that her children need to eat these foods. Orange fruits and vegetables, and dark green leafy vegetables provide vitamin A. There is also some vitamin A in breastmilk.

Group diagnosis 8: Eye problem 15: Cataract
Poor eyesight day and night



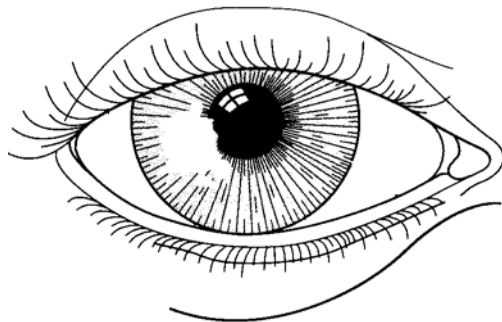
PICTURE 47 Eye problem 14: cataract

Rashid, a 70-year-old man, has had poor eyesight for many years. His eyesight is slowly getting worse. Rashid does not have any other illness. The insides of the eyelids are normal and the white parts of the eyes are normal. The corneas are clear. The pupils are cloudy white. You hold up your fingers 3 metres in front of Rashid and ask him to tell you how many fingers he can see. He cannot see your fingers. Rashid has cataracts. As the lenses in the eyes get old or damaged, they become cloudy white. A cloudy white lens is called a cataract.

Ask the students: 'Does your picture show a cataract? Why?'

Treatment: A short operation can sometimes cure cataracts. Tell Rashid that there is an operation which may allow him to see again. The operation is sometimes free and is not painful. Tell Rashid to go to the eye clinic. Diabetes is the second most common cause of blindness in Africa. Test urine for sugar if a patient is blind. Glasses or a hat can prevent cataracts from getting worse.

Group diagnosis 8: Eye problem 16: Corneal scar from trachoma or onchocerciasis
Poor eyesight day and night



PICTURE 48 Eye problem 15: corneal scar

Justine is a 30-year-old woman. Her eyesight is slowly getting worse. Justine does not have any other illness. The eyelids are scarred but the white parts of the eyes are normal. Part of the cornea is white. The pupil is not black because the cornea is not clear. Justine is able to count your fingers from 3 metres but she cannot see well enough to read. Justine has a corneal scar, caused by repeated infections with trachoma. Often with trachoma the eyelids are scarred and the eyelashes point the wrong way and may cause corneal damage.

Onchocerciasis can also damage the cornea, or the iris, or the back of the eye. Onchocerciasis is only seen in a few countries. The flies which give people onchocerciasis live in fast-flowing rivers.

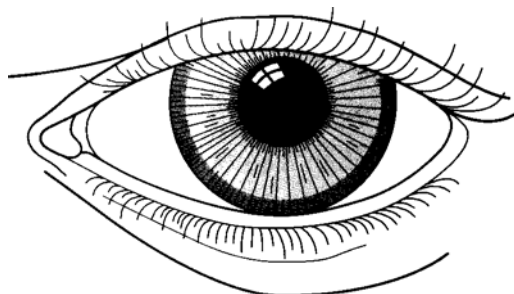
Ask the students: 'Does your picture show a corneal scar? Why?'

Treatment: If the eye is painful, put tetracycline eye ointment in the eye and send Justine to hospital immediately. If Justine lives in an onchocerciasis area treat her and all the people in her village with ivermectin unless there is loaloa in your area. Give ivermectin 6 mg one time every year.

**Group diagnosis 8:
Poor eyesight day
and night**

Eye problem 17: Chronic glaucoma

A patient with chronic glaucoma may complain of blurry vision after they have become blind in the other eye. When you check their eyesight they find it difficult to see things on either side. After a time, the vision directly in front of them goes blurry too.



PICTURE 49 Eye problem 16: An eye that looks normal

Chronic glaucoma does not cause pain. The eyes look normal. Often someone else in the family is blind because of chronic glaucoma. If chronic glaucoma is not discovered until after it has caused severe blindness the eye(s) may become red and painful (and hard when pressed).

Ask the students: 'Could your picture show chronic glaucoma? Why?'

Treatment: Chronic glaucoma can be treated with eye drops every day for the rest of the patient's life or sometimes a procedure. If this is done consistently you will usually save their sight. It is not possible to cure glaucoma. Glaucoma runs in families.

Group diagnosis 9: Eye problem 18: Orbital cellulitis

Swellings next to the eye

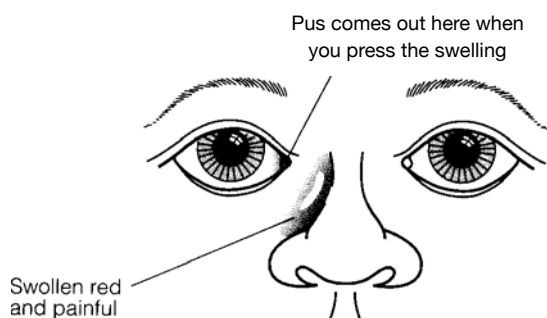
Ravi, a 4-year-old child, has a swollen and painful left eye, Ravi has a fever. The top and bottom eyelids of the left eye are swollen, The white part of the eye is red and swollen. The cornea is clear. The pupil is black. Ravi is able to see with his left eye but can only look forwards (he may have double vision). Ravi has orbital cellulitis. (If there is no fever, and no redness or swelling of the white part of the eye, a milder infection of just the eyelids (preseptal cellulitis) can be treated without hospital admission.)

Treatment: Put tetracycline ointment in his eye. You give Ravi an intramuscular injection of benzylpenicillin and send him to hospital immediately. (The correct treatment for orbital cellulitis is ceftriaxone and metronidazole.)

In South America and Central America: Romaña's sign of Chagas disease can look similar to preseptal cellulitis. Chagas disease at that stage will often have fever, headache and lymph node enlargement. Follow national protocols for diagnosis and treatment.

Group diagnosis 9: Eye problem 19: Acute dacrocystitis

Swellings next to the eye



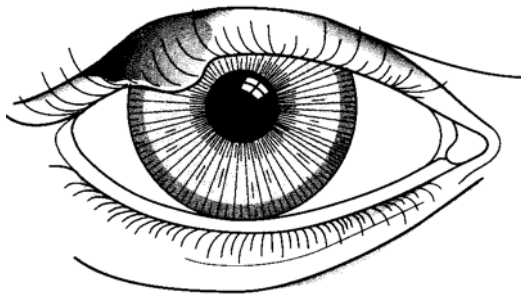
PICTURE 50 Eye problem 18: acute dacrocystitis

Mwanaasha, a 40-year-old woman, has pain underneath her right eye. Pus has been coming out of her eye for 2 days. Mwanaasha does not have any other illness. The eyelids are normal. The white part of the eye is red. The cornea is clear. The pupil is black. Mwanaasha can see as normal with her right eye. There is a red swelling next to the nose. When you touch the swelling, pus comes out of the eye and Mwanaasha tells you that it makes the pain worse. Mwanaasha has acute dacrocystitis.

POSTER 3:
(Prepared poster)

Draw Picture 50 on Poster 3. Show students the symptoms of acute dacrocystitis.

Group diagnosis 9: Eye problem 20: Sty or infected meibomian cyst
Swellings next
to the eye



PICTURE 51 Eye problem 19: sty or infected meibomian cyst

Eight-year-old Suleiman has had a swelling above his right eye for 4 days. Suleiman does not have any other illness. There is a red swelling in his right eyelid near to the eyelashes. The swelling is painful when you touch it. The white part of the eye is normal. The cornea is clear. The pupil is black. Suleiman is able to see as normal with his right eye. Suleiman has a sty or an infected meibomian cyst.

Ask the students: 'Could your picture show a sty or infected meibomian cyst? Why?'

Treatment: Give Suleiman's carer tetracycline eye ointment to put in his right eye two times a day for 5 days. Tell her to take Suleiman to the eye clinic if the pain has not improved after a week. If the swelling is not red or tender, then there is no need to use the eye ointment. Advise the carer to massage the swelling twice day until the cyst discharges. It may take weeks for the cyst to empty.

SECTION 5: When to refer patients to hospital

Ask the students to use Appendix 21 to tell you which patients to send to an eye hospital or clinic.

SECTION 6: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1 A 2-week-old baby has had pus coming out of both eyes for two days. What could cause this?

- Chlamydia conjunctivitis

2 Name three causes of pain in the eye.

- Corneal ulcer
- Iritis
- Acute glaucoma
- Foreign body in the cornea or corneal abrasion
- Orbital cellulitis
- Acute dacrocystitis
- Sty or infected meibomian cyst

3 Name three causes of poor eyesight when the eye is not red.

- Needs glasses
- Lack of vitamin A
- Cataract
- Chronic glaucoma
- Corneal scar from trachoma or onchocerciasis

4 A patient has a red eye which is painful. Their eyesight in that eye is worse than normal. How will you treat them?

- Put antibiotic eye ointment or a drop in the eye.
- Give vitamin A to a child less than 6 years old.
- Send to eye hospital immediately.

5 What eye conditions can be linked with each of the following health problems?

- HIV - *Cytomegalovirus (CMV) retinitis (painless loss of sight)*
- Diabetes - *Cataract or retinopathy (painless loss of sight), or central retinal venous occlusion*
- High blood pressure - *Central retinal venous occlusion (sudden one-sided loss of sight). It is important to treat the high blood pressure (lifestyle and medication)*
- Cerebral malaria - *Check the retina of an unconscious or severely ill patient to look for retinal haemorrhages that can occur in cerebral malaria.*
- Old age - *Cataract or macular degeneration.*

PART 3 **Appendices**

Appendix 1 How to treat children aged five or less who have a cough or difficult breathing

1 Questions:

Ask the carer:

1. When did the symptoms **start**?
2. Have they have a **fever**?
3. Do they have a **cough** or **difficult breathing**?
4. Are they **feeding** and **drinking** well?
5. Do they have **diarrhoea**?
6. What **medicines** have they had in the last two weeks?
7. Is the child fully **vaccinated**. What is their **HIV** status?

2 Check for general danger signs

1. If the child is unconscious, or moves less than usual, when awake.
2. If the child has had a convulsion.
3. If the child has vomited four times or more this morning.
4. If the child is not able to drink or breastfeed.

3 Diagnose and treat general danger signs

1. If they have vomited, clear the mouth, lay them on their side. Treat fever with tepid sponging.
2. If you're still having a convulsion give them diazepam rectally.
3. Treat to prevent low blood sugar.
4. Give them an intramuscular injection of artesunate, artemether or quinine if RDT positive.
5. Give them an intramuscular injection of ceftriaxone, benzylpenicillin or procaine penicillin fortified.
6. **Send them to hospital immediately.**

4 Examine

- Look for fever and anaemia
- Look for chest indrawing severe? mild?
- Count how many times they breathe in one minute
 - 0-2 months x60 or more?
 - 2-12 months x50 or more?
 - 1-5 years x50 or more?
- Listen for a noise when the child breathes **in**
 - harsh noise? = Stridor
- Listen for a noise when the child breathes **out**
 - soft whistling? = wheeze

5. Classify

- Severe illness
 - Severe indrawing
 - Stridor
- Moderate illness
 - Mild indrawing
 - Fast breathing
- Mild illness
 - The child does not have fast breathing.
 - When the child is calm there is no noise when the child breathes in.

Stridor

There is a harsh noise when the child is calm and breathes in. **Give them ceftriaxone or benzylpenicillin. Send them to hospital immediately.**

A severe illness which may be pneumonia or asthma
Give an injection of benzylpenicillin. Test for malaria. If over 1 year: If they have a wheeze give a rapid acting bronchodilator. Send to hospital

Moderate illness (Pneumonia)
Give amoxicillin or co-trimoxazole. Consider HIV/ Pneumocystis Jirovecii
Teach mother about home treatment for chest illnesses. See again after two days. **If no better give benzylpenicillin and send to hospital.**

Mild illness (No pneumonia)
1. Treat wheeze if has wheeze.
2. Upper respiratory infection. If has no ear or throat problem do not give an antibiotic. Teach carer about home treatment for chest illnesses.
3. If fever present - test for malaria in malaria areas

Home treatment for chest illnesses

1. Give plenty of fluids
2. Continue feeding at least five times a day
3. Tell the carer when to return:
 - If the child is not able to drink or breastfeed
 - If the breathing becomes difficult or fast
 - If the patient becomes more ill
 - If the patient develops a new fever

How to treat wheeze:

1. If has a sign of respiratory distress give a rapid acting bronchodilator and an injection of benzylpenicillin and **send to hospital.**
2. If has no sign of respiratory distress, but has fast breathing, treat for pneumonia that is not yet severe.
3. If has no signs of respiratory distress, and does not have fast breathing, give them a bronchodilator to use at home and teach carer about home treatment for chest illnesses.

Other emergency options for moderate and severe asthma

- Moderate and severe asthma can be treated with oral steroid tablets. For example prednisolone 2mg/kg per day.
- Hydrocortisone 100mg (4mg/kg) can be injected intravenously for severe asthma if you have been taught intravenous injection skills.

Coughing fits - possible pertussis (whooping cough)

- If the cough started less than 3 weeks ago consider treatment with azithromycin or co-trimoxazole to prevent infecting others
- Without treatment in the first week the cough of whooping cough may take 100 days to disappear (and 6 weeks to improve)

Appendix 2 How to treat patients aged five or above who have a cough or difficult breathing

1 Questions:

1. When did the symptoms **start**?
2. Have you had a **fever**?
3. Do you have a **cough** or **difficult breathing**?
4. Are you eating and **drinking** well?
5. Do you have **diarrhoea**?
6. What **medicines** have you had in the last two weeks?
7. What is your **HIV** status?
8. Please cough. Point to any place that you feel pain.
9. If 13 years or more: What colour is your sputum?

2 Check for general danger signs

1. If the patient is unconscious, or moves less than usual, when awake.
2. If the patient has had a convulsion.
3. If the patient has vomited four times or more this morning.
4. If the patient is not able to drink.

3 Diagnose and treat general danger signs

1. If they have vomited, clear the mouth, lay them on their side. Treat fever with tepid sponging.
2. If they are still having a convulsion give them diazepam rectally.
3. Treat to prevent low blood sugar.
4. Give them an intramuscular injection of artesunate, artemether or quinine if RDT positive.
5. Give them an intramuscular injection of ceftriaxone, benzylpenicillin or procaine penicillin fortified.
6. **Send them to hospital immediately.**

4 Examine

- Look for fever and anaemia
- Look for chest indrawing severe?
mild?
- Count how many times they breathe in one minute
6-12 years x30 or more?
13+ years x25 or more?
- Listen for a noise when the patient breathes **in**
harsh noise? = Stridor
- Listen for a noise when the patient breathes **out**
soft whistling? = wheeze

5. Classify

- Severe illness
 - Severe indrawing
 - Stridor
- Moderate illness
 - Mild indrawing
 - Fast breathing
- Mild illness
 - The patient does not have fast breathing.
 - When the patient is calm there is no noise when the child breathes in.

Stridor

There is a harsh noise when the patient is calm and breathes in. **Give them ceftriaxone or benzylpenicillin. Send them to hospital immediately.**

A severe illness which may be pneumonia or asthma
Give an injection of benzylpenicillin. Test for malaria. If they have a wheeze give a rapid acting bronchodilator. Send to hospital

Moderate illness (Pneumonia)

Give amoxicillin or co-trimoxazole. Consider HIV/ Pneumocystis Jirovecii
Teach about home treatment for chest illnesses. See again after two days. **If no better give benzylpenicillin and send to hospital.**

Mild illness (No pneumonia)

1. Treat wheeze if has wheeze.
2. Treat bronchitis if 13 years or more and coloured sputum for 8 days.
3. Upper respiratory infection. If has no ear or throat problem do not give an antibiotic. Teach about home treatment for chest illnesses.
4. If fever present - test for malaria in malaria areas

Home treatment for chest illnesses

1. Give plenty of fluids
2. Eat at least 4 times a day
3. Tell them when to return:
 - If not able to drink
 - If the breathing becomes difficult or fast
 - If the patient becomes more ill
 - If the patient develops a new fever

How to treat bronchitis:

Treat with amoxicillin 250 mg x3/day for 5 days. Or co-trimoxazole. If has red sputum, or is no better after treatment: refer for TB testing.

How to treat wheeze:

1. If has a sign of respiratory distress give a rapid acting bronchodilator and an injection of benzylpenicillin and **send to hospital.**
2. If has no sign of respiratory distress, but has fast breathing, treat for pneumonia that is not yet severe.
3. If has no signs of respiratory distress, and does not have fast breathing, give them a bronchodilator to use at home and teach about home treatment for chest illnesses.

Other emergency options for moderate and severe asthma

- Hydrocortisone 100mg (4mg/kg if less than 25kg) can be injected intravenously for severe asthma.
- Moderate and severe asthma can be treated with oral steroid tablets. For example prednisolone 30mg daily after food for 3 days for patients weighing 15kg or more (2mg/kg per day if less than 15kg).

If COVID test has been positive and symptoms started more than 5 days ago:

If the oxygen level is less than 92%, or they have fast breathing (consistently more than 25 breaths per minute) they need urgent steroid treatment and specialist assessment.

Coughing fits - possible pertussis (whooping cough)

- If the cough started less than 3 weeks ago consider treatment with azithromycin or co-trimoxazole to prevent infecting others
- Without treatment in the first week the cough of whooping cough may take 100 days to disappear (and 6 weeks to improve)

APPENDIX 3 How to give injections

Do not give injections if there is a safer way of giving medicine. If you give medicines by injection, you will use two types of injection:

- **Intramuscular injections** - for example, these are used to give many antibiotics, malaria treatments, ergometrine to prevent or treat postpartum haemorrhage, epinephrine to treat anaphylaxis.
- **Subcutaneous injections** - for example, these are used to give epinephrine to treat respiratory distress.

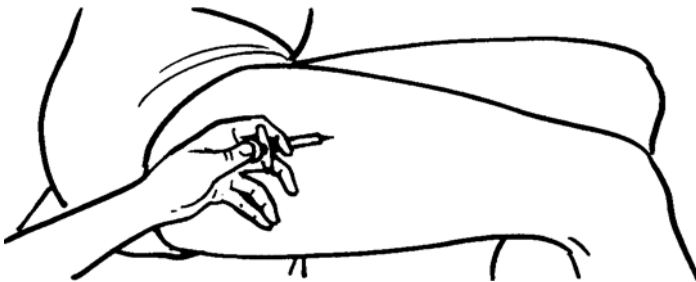
Before the injection

1. Clean your hands with soap or ash, and water.
2. Use a new or sterile needle and syringe.
3. Do not touch the metal end of the needle.
4. Learn how to draw up each medicine.
5. Put the needle and syringe together and draw up the medicine.
6. Ask the patient to sit or lie down.
7. Clean the skin at the injection site with alcohol or soap and water.

How to give intramuscular injections

Give intramuscular injections into the front outer part of the upper leg as shown in Picture 52. Do not inject into the buttocks. If you are injecting more than 3 ml, inject half of the medicine into each leg.

1. Put the needle into the muscle.
2. Pull the plunger gently. If blood enters the syringe take the needle out and put it in at another clean area.
3. If no blood enters the syringe, inject the medicine slowly.
4. Remove the needle and clean the skin.



PICTURE 1 *How to give an intramuscular injection*

How to give subcutaneous injections

Give subcutaneous injections into the back of the upper arm as shown in Picture 53.

1. Hold the fatty part of the back of the upper arm with one hand.
2. Point the needle upwards so that it goes into the fat, *not* the muscle.



PICTURE 53 *How to give a subcutaneous injection*

After the injection

Discard the needle and syringe immediately after use.

(If you have to reuse needles and syringes:

1. Push bleach or soapy water through the needle and syringe three times.
2. Take everything apart.
3. Steam or boil the syringe and needle for 20 minutes. (*Note: at altitudes over 2000 m boil for 40 minutes.*)
4. Leave the syringe and needle covered until you use them again.)

APPENDIX 4 How to give diazepam rectally



PICTURE 54 *How to give diazepam rectally*

1. Lay the patient on their left side
2. Ask the patient to bend their knees up so that they touch the abdomen.
3. Wet or lubricate the end of the diazepam rectal tube.
4. Put the end of the rectal tube into the anus (Picture 54).
5. Push the tube gently into the rectum.
6. Squeeze the diazepam into the rectum.

APPENDIX 5 How to make a measuring bottle for liquid medicines

It is important to give the correct amount of medicine.

- If we give our patients too little medicine they will not get better.
- If we give our patients too much medicine we will not have enough medicine for other patients.

Making a measuring bottle

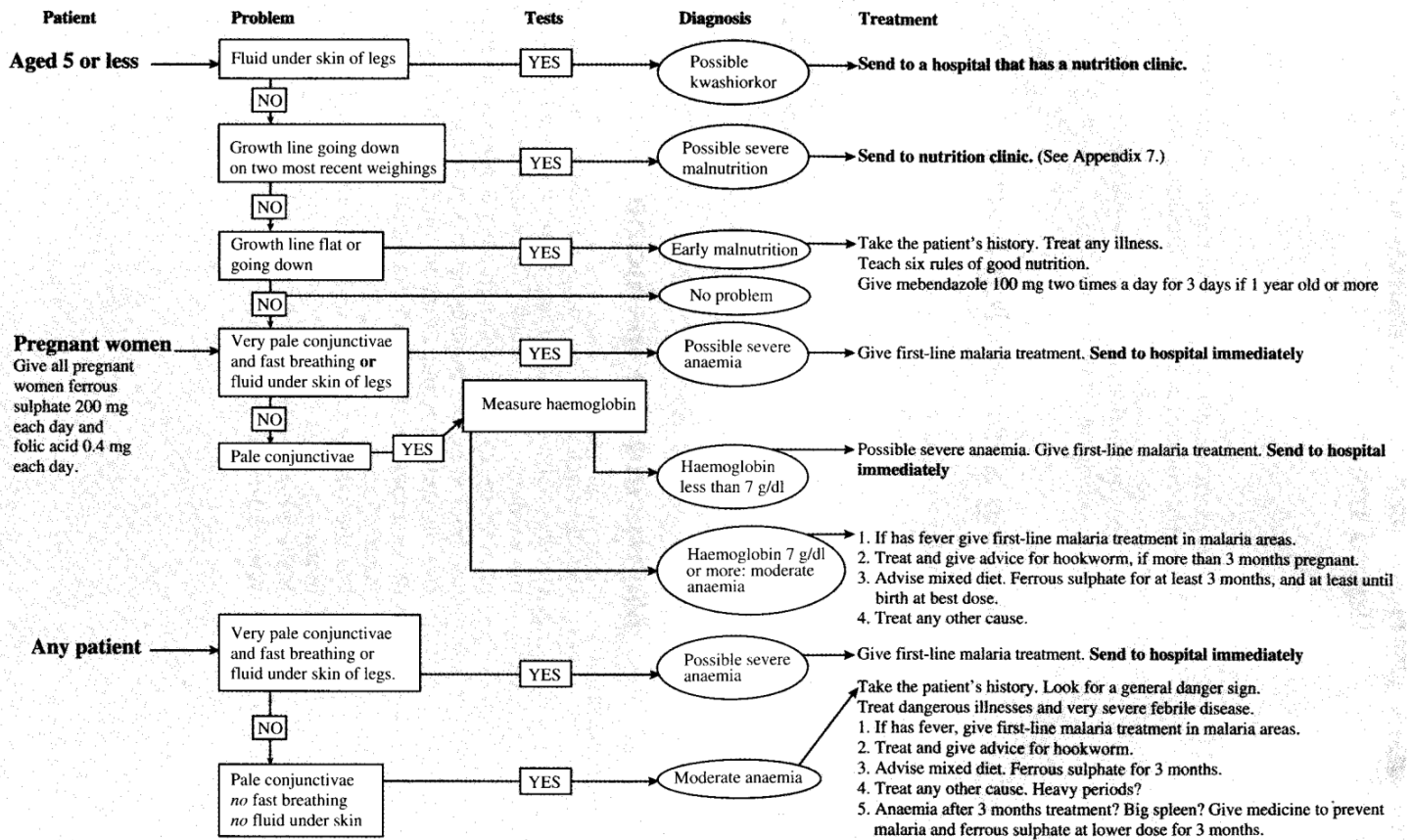
If you do not have a way of measuring liquid medicine, you can make a measuring bottle. You will need:

- a syringe
- a clear narrow bottle that is big enough to contain the largest amount of liquid medicine that you will measure
- tape or a pen with permanent ink to mark the side of the bottle
- liquid medicine or water to calibrate the bottle.

Measuring the medicine

1. Decide which medicine you will measure with this bottle.
2. Decide what amounts of liquid you will need to measure for this medicine. For example, for amoxicillin (125 mg in 5 ml) you might 37.5 ml for babies less than 2 months or 75 ml for ages 2-11 months.
3. Use the syringe to put 37.5 ml of water into the bottle.
4. Make a mark at the top of the water.
5. Write 37.5 ml next to the mark.
6. Use the syringe to put a further 37.5 ml of liquid into the bottle.
7. Make a mark at the top of the liquid.
8. Write 75 ml next to this mark.

APPENDIX 6 How to treat malnutrition and anaemia



APPENDIX 7 How to set up a nutrition clinic (includes diagnosis and management of severe malnutrition)

A nutrition clinic needs:

- a microscope and staff with the skills to examine blood and faeces to look for parasites
- a method of measuring haemoglobin and blood sugar
- trained staff to teach carers how to grow and prepare foods that follow the six rules of good nutrition
- trained staff to decide what treatment to give each child and to review each child every week

Examination and diagnosis of a child who may have severe malnutrition

1. Look at the child's record card to see what problems, tests and treatment the child has had.
2. Test the blood for malaria and anaemia.
3. Examine the faeces with a microscope to look for eggs of worms and other parasites.
4. Measure the child's blood sugar. If the blood sugar is 2 mmol/l or less, give the patient 50 ml of sugar water or milk immediately.
5. Make sure that the child is not cold.
6. Weigh the child without their clothes. Weigh them again twice a week. Use the same scales each time. Weigh the child at the same time of day each time. Write the weights on the child's record card.

Treatment

1. If the child has malaria parasites in the blood, treat for malaria.
2. If the child has anaemia:
 - If the haemoglobin is less than 5 g/dl, give the child a blood transfusion slowly (in hospital). Give 20 ml of blood for each kg of body weight. Also give one dose of furosemide 20 mg by mouth.
 - If the child has fast breathing or swelling of the legs give a blood transfusion slowly (in hospital). Give 20 ml of blood for each kg of body weight. Also give one dose of furosemide 20 mg by mouth.
 - Treat all patients with a haemoglobin below 10 g/ dl with ferrous sulphate (or a combination of ferrous sulphate with folic acid) at the full dose for 3 months.
3. Assume the child has worms if they are over 6 months, treat with albendazole. If the child is less than 2 years old, give albendazole 200 mg as a single dose. Give 400 mg as a single dose for those over 2 years.
4. Treat any other infections. Amoxicillin should be given to all children with severe acute malnutrition (<https://medicalguidelines.msf.org/en/viewport/CG/english/severe-acute-malnutrition-16689141.html>). Look for TB and HIV.
5. Give all patients vitamin A.
6. Give multivitamins every day.
7. Make sure the child is given all of their vaccinations.
8. Feed the child (see below).

Feeding a child with severe malnutrition

1. Make the child feel comfortable when you are feeding them. Give the child time. Use a cup and a small spoon. Try using brightly-coloured cups.
2. Ask the mother to breastfeed the child if they are 2 years old or less. Breastfeed a child with malnutrition every 2 hours. If the child is not well enough to feed from the breast, the mother can express milk into a cup by pressing the nipple between two fingers and squeezing the breast for several minutes. She should do this for both breasts every 2 hours. Feed the milk to the baby using a small spoon.
3. If the child will not feed using a cup and a spoon, put in a nasogastric tube. Use a syringe to feed the child.
4. If the mother is ill and not producing enough breast milk, also give the child nutrition milk (see recipe below) after each breastfeed. Use a cup and a spoon
 - Do not give children who have fluid underneath their skin or a nasogastric tube too much nutrition milk, because this may cause heart failure.
 - Give children who have fluid underneath the skin or a nasogastric tube 100 ml of nutrition milk for each kg body weight in a day.
 - Make enough nutrition milk for one day. For example a child who weighs 8 kg needs 100 ml for each kg of body weight. This is a total of 800 ml in one day. Feed the child every 2 hours during the day. Give eight feeds of 100 ml each day.
 - If the child does not have fluid under the skin or a nasogastric tube, give them between 150 ml and 200 ml nutrition milk for each kg of body weight in a day.
5. Give nutrition porridge to the child as soon as the child is able to eat. Give nutrition porridge two times a day at first if the child has not been eating.
6. Give nutrition porridge four times a day as soon as the child is able to play. Give fruit and vegetables between feeds. Stop giving nutrition milk. Continue to breastfeed.
7. Next, give the child solid foods to chew. Let the child feed himself with their hands or a spoon.

Recipes

Nutrition milk

To make 1000 ml you need:

- 750 ml cows' milk or goats' milk
 - 1 egg
 - 6 teaspoonfuls (6 x 5 ml) of sugar
 - 6 teaspoonfuls (6 x 5 ml) of cooking oil
1. Put these foods into a cooking pot and mix.
 2. Heat until the food boils.
 3. Stir occasionally.
 4. Remove the pot from the heat and cover.
 5. Let the milk cool before giving to the child.

Nutrition porridge

To make enough for one meal you need:

- 2 large spoons of ground maize, sorghum, cassava or rice
 - 1 handful of peanuts, small fish or 1 egg
 - 2 teaspoonfuls of sugar
 - 1 teaspoonful (5 ml) of cooking oil
 - One and a half cups of water
1. For children less than 1 year old, grind the peanuts or small fish.
 2. Put the foods into a cooking pot and mix.
 3. Heat until the food boils.
 4. Stir occasionally.
 5. Remove the pot from the heat and cover.
 6. Let it cool a little before giving to the child.

Watch for changes

If the child is doing well:

- Their weight will start to increase.
- If the child had fluid underneath the skin, their weight may decrease before increasing. This is because the fluid underneath the skin is disappearing as the child gets better.
- The child will start to eat well, play and smile when they are better.

If the child is not doing well:

- Their weight will not increase or it may decrease.
- If the child continues to have diarrhoea, look again for an infection.
- Examine the faeces for parasites.
- Examine the urine.
- Look for TB or HIV.
- Sometimes milk will make the diarrhoea worse. Do not stop the milk.

Teach the carer

1. Start to teach the carer immediately.
 - Explain to the carer why her child is in hospital.
 - Tell the carer that you will help her to make sure that her child grows.
 - Tell her that a mixed diet is the most important part of the child's treatment.
 - Tell her that you will also give her child treatment for problems which are stopping him from growing.
2. Ask respected local women to teach groups of carers how to grow and cook nutritious foods for a mixed diet. They can show the carers how to improve the meals they cook already.
3. Show carers how they can follow the six rules of good nutrition.
4. Send the carer and child home:
 - when the carer knows how to feed her child
 - if the child smiles
 - when the child can eat four meals of nutrition porridge each day and can eat other solid foods.
5. Ask the carer to bring her child back to the nutrition clinic after 1 month.

APPENDIX 8 Sickle cell disease

People with sickle cell disease are born with the disease, but they do not become ill until after 6 months of age. Their bodies make red blood cells that do not work correctly. Their misshapened red blood cells block blood vessels or are taken out of the blood stream early by the spleen causing anaemia.

Without preventative treatment, children with sickle cell disease often die in early childhood. If you think that a patient may have sickle cell disease, send them to hospital for a test.

Problems and signs of sickle cell disease

Knowing more about sickle cell disease will help you to watch out for it. Early diagnosis and early treatment of the problems linked with sickle disease will save lives and help patients live more healthy, happier lives.

Anaemia	The red blood cells of a person with sickle cell disease don't last as long as normal red blood cells. Malaria and other infections can cause even more damage to the red blood cells in a sickle cell patient. This often causes anaemia. Look for malaria and anaemia and make sure that they get early treatment.
Pain and swelling of joints and bones	Sickle cell disease often causes fingers or toes to swell. Pain in the chest or abdomen is also common. This because damaged red blood cells block blood vessels and cause part of the joint, bone or other parts of the body to die. The swelling is very painful. If a bone is hot or red, treat for osteomyelitis. If a joint is hot or tender treat for septic arthritis.
Frequent infections	Patients with sickle cell disease are more likely to get pneumococcal pneumonia and sinusitis. This is because their spleen does not work well. They should be given regular penicillin to prevent these infections until they are 5 years old. eg phenoxymethylpenicillin two times a day (1-11 months - 62.5 mg each dose; 1-4 years 125 mg each dose).
Tall forehead	Patients with sickle cell disease make red blood cells in the front of the skull. Children with sickle cell disease who are older than 4 years have a tall forehead.
Slow growth	Children with sickle cell disease grow more slowly than other children. They are often slow to learn how to sit up and to talk.

Advice for parents of children with sickle cell disease

If your child has sickle cell disease there are several things that you should know:

1. Your child was born with sickle cell disease. Children do not become ill with sickle cell disease until after the age of 6 months. They get sickle cell disease from both their father and their mother.
2. Since you have a child with sickle cell disease: any future child that you, as a couple, has will have a one-in-four chance of being born with the disease.
3. Sickle cell disease can not be cured*.
4. Your child should eat a mixed diet. Protein, energy, vitamins and minerals are all important to keep your child healthy and to help them to grow.
5. It is very important that the child drinks plenty of fluids if they get diarrhoea or become unwell.

6. Their blood is weak. This is called anaemia. Anaemia may make the child out of breath. The blood may become solid inside parts of the body, causing pain in the bones, the chest or the stomach.
7. Although the disease cannot be cured, medicines will make the child stronger.
8. The blood may become solid (clot) inside parts of the body, causing pain in the bones, the chest, or the stomach. This is more likely to happen if they become dry or if they have a fever.
9. Although sickle cell disease cannot be cured, medicines will make your child stronger.
10. It is important for the child to take one 5 mg tablet of folic acid each day to make the blood stronger.
11. Treatment to prevent malaria is often recommended in areas, or seasons, when malaria transmission is moderate or severe. Deltaprim is one example. Deltaprim is usually given weekly.
12. It is important to come to the health centre as soon as possible, if the child is ill, has a fever, or is very breathless.
13. Make sure that you get more tablets before their folic acid or malaria tablets are finished.

Preventative treatment

Giving preventative treatments will make a big difference to how healthy a child with sickle cell disease is. There are 7 things to think about relating to preventative treatments:

1. Give the child folic acid 5 mg every day and provide a mixed diet.
2. Consider giving the child medicine to prevent malaria such as deltaprim. The national policy should tell you what malaria treatment to use to prevent malaria is in your country. The treatment to prevent malaria might be recommended only in the malaria seasons or in areas of the country where malaria is common.
3. The child should sleep under a mosquito net that has been treated with an insecticide (permethrin every 6 months or deltamethrin every 12 months).
4. Take the child to see a clinician as soon as possible if they get a fever, possible malaria or any other infection.
5. Do not give treat a child with sickle cell disease with ferrous sulphate.
6. Make sure that the child gets all of the normal immunisations against infectious diseases.
7. Hydroxyurea is sometimes used to prevent sickle cell crises and anaemia. Sometimes hydroxyurea is used to treat a painful crisis or anaemia. Hydroxyurea increases the production of a healthy type of haemoglobin (fetal haemoglobin). Usually Hydroxyurea makes the red blood cells work better and last longer. Ask your clinician whether it might be suitable for you or your relative. Hydroxyurea can occasionally make infection, anaemia or bruising and bleeding more common. All medicines can occasionally cause side effects or even make you ill.

Treatment when a child with sickle cell disease is ill

If your child becomes unwell they will need extra care because they are likely to be much more unwell than other children.

1. It is very important to prevent dehydration. When your child is unwell, please give them 1 teaspoonful of oral rehydration solution every minute until they pass pale urine.
2. If your child is in pain please give them something to reduce pain, for example paracetamol. Your clinician may choose to give you another medicine for more severe pain such as tramadol.
3. Treat any infections immediately. If the child has a fever, make sure that they get tested for malaria immediately if malaria is a possibility.
4. If your child is in a lot of pain or is very anaemic your clinician will usually:
 - give oral rehydration solution and treat the pain.
 - Test for malaria in malaria areas.

- They may give a single dose of co-trimoxazole (at a double dose) to treat for possible infections.
 - They may send the child to hospital to look for a serious infection.
5. If your child is very anaemic the inside of their eyelids will be very pale, and they may breathe quickly. They may even have swollen lower legs. If this happens your clinician will usually:
- Test them for malaria;
 - Give extra folic acid;
 - They may give an injection of benzylpenicillin to treat for possible infections;
 - They may send the child to hospital for a blood transfusion.

Other advice for people living with sickle cell disease

Sickle cell disease makes many illnesses more common. Some of those illnesses are not always noticed by friends and family. There are 3 extra things that it is helpful for friends, family and work colleagues to know.

Firstly

1. It is common for people with sickle cell disease to miss school or work because of illness. Secondly:
2. People with sickle cell disease should be physical active when possible. But they might not always be as physically fit as other people. And thirdly:
3. Low mood, stress and anxiety are more common in people with sickle cell disease. People with sickle cell disease should be encouraged to talk about their feelings and emotions. Preferably with someone who they trust who knows about their difficulties. Someone who is good at listening and can offer support.

* Gene therapy is not yet available in Africa. It is experimental with uncertain safety or long term results.

APPENDIX 9 How to make treatments for fungus skin infections

There are many traditional and local treatments that are used for putting on to the skin to treat yeast or fungus infections. Unfortunately, some of these medicines may make the skin irritated and sore. We suggest that you use treatments (that are new to a patient) on only a small area for a few days to check that the patient does not react badly to the new medicine.

Here are two examples of medicines for fungal and yeast infections of the skin. Do not drink these medicines. The recipes and the picture are reproduced with kind permission from the book *Natural Medicine in the Tropics*, by Dr Hans Martin-Hirt and Bindanda M'Pia.

Recipe 1

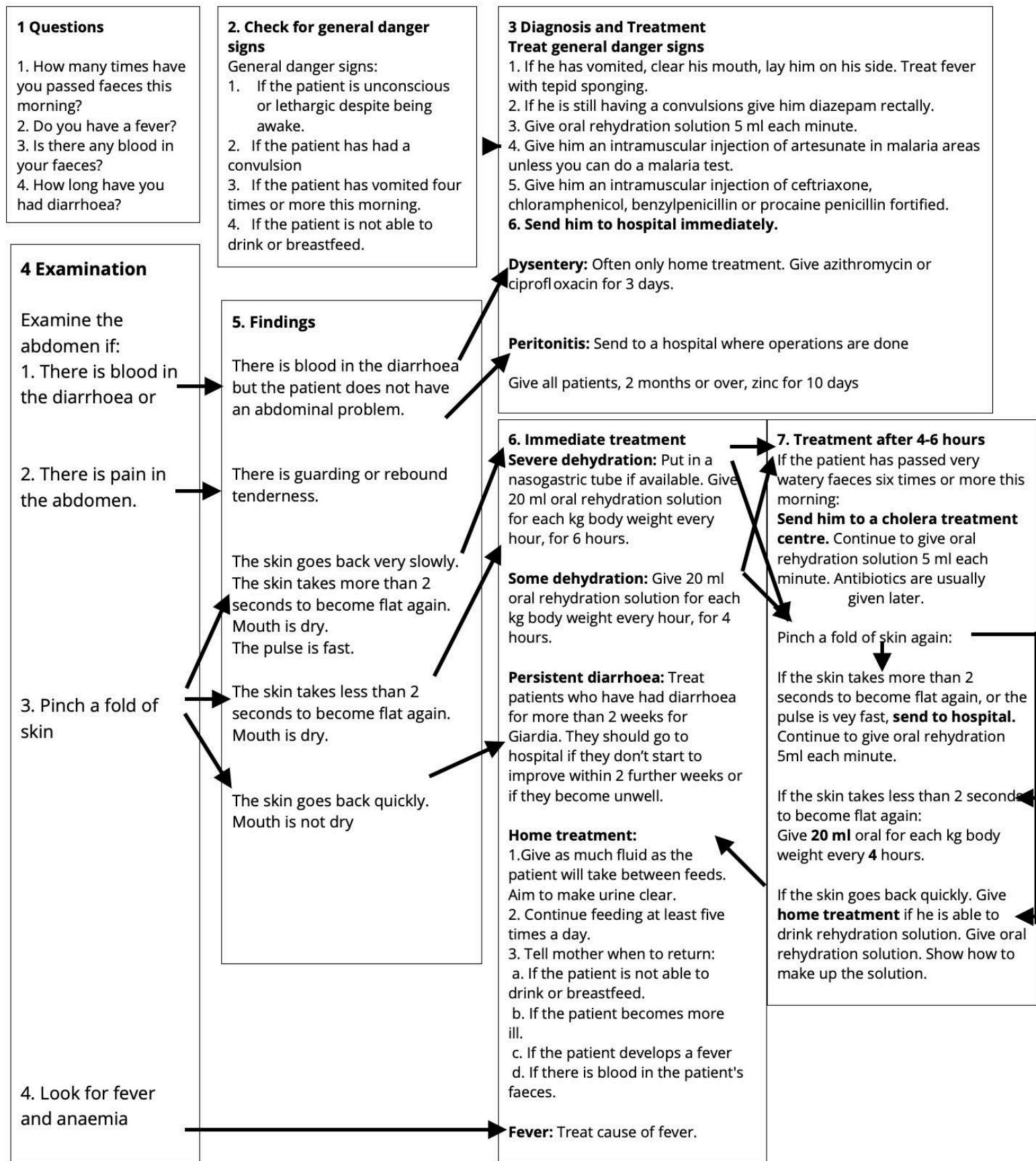
1. Press the sap (juice) out of the fresh leaves of the *Cassia alata*, the ringworm bush, using a wooden stick in a wooden pounding bowl.
 2. Rub the sap on the affected area two or three times each day.
- Alternatively, mix the sap with the same amount of palm oil. This medicine will only keep for one day.

Recipe 2

1. Collect the white latex or sap from the skin of unripe papaya (pawpaw) fruit. Leave the fruit on the tree when you collect the sap.
2. Mix the sap as follows:
 - 10 drops of papaya latex (sap)
 - 1 handful of young fresh *Cassia alata* leaves pounded
 - 1 large spoonful of vegetable oil. Palm oil or ricinus (castor) oil are suitable.
3. Rub this mixture onto the infected area three times a day. This preparation will only keep for one day.

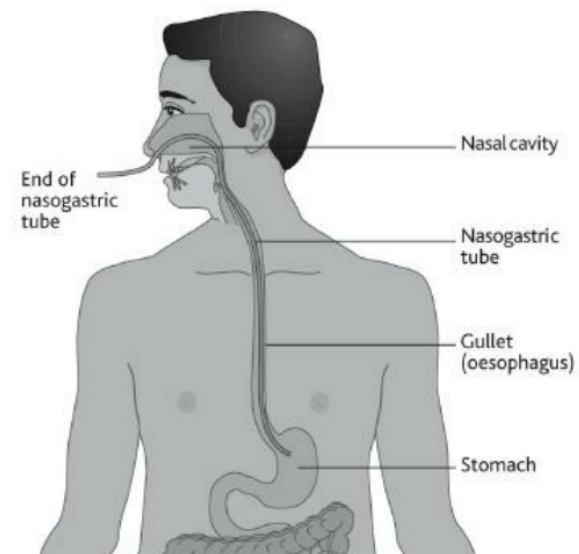


PICTURE 55 *Cassia alata*



APPENDIX 11 How to put in a nasogastric tube

1. Use a clean rubber or plastic nasogastric tube:
 - For a child use a tube 2.0 mm to 2.7 mm in diameter.
 - For an adult use a tube 4.0 mm to 6.9 mm in diameter.
2. Sit the patient down. Raise the head slightly.
3. Measure the length of tube that the patient will swallow. Place one end of the tube just above the middle of the abdomen.
4. Next, take the rest of the tube over the back of the ear and forward to the end of the nose. Mark the tube with a piece of tape where it touches the end of the nose.
5. Wet the tube with water. Do not use oil.
6. Put the end of the tube into the larger nostril. Aim towards the back of the head. Push the tube slowly until the end is in the back of the throat.
7. Ask the patient to drink a little water if the patient is awake. Each time the patient swallows, push the tube another 3 cm.
8. If the patient coughs repeatedly, pull the tube back slowly until the coughing stops. Wait a minute. Next, slowly try to push the tube again.
9. Stop when the tape marker reaches the nose.
10. Put a stethoscope (or your ear) on the upper abdomen. Use a syringe to push air quickly into the tube. Listen.
 - If the end of the tube is in the stomach you will hear air entering the stomach.
 - If you cannot hear air bubbling into the stomach, do not put any fluid into the tube.
 - If you do not hear air entering the stomach, check that the tube is not all at the back of the throat.
 - If the tube is not all in the throat, and the patient is not coughing, push the tube 5 cm further. Next push air into the tube again.
11. When you hear air entering the stomach fasten the tube to the face with tape.
12. Use a syringe to give oral rehydration solution, milk or sugar water.
 - Give 20 ml of fluid for each kg body weight every hour slowly throughout the hour to treat dehydration.
 - Give 30-50 ml of milk or sugar water quickly to patients with a general danger sign.



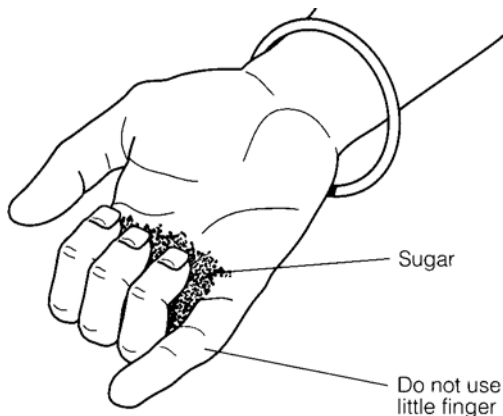
Please watch this YouTube clip
(click on the photo to play)

APPENDIX 12 Other treatments for diarrhoea

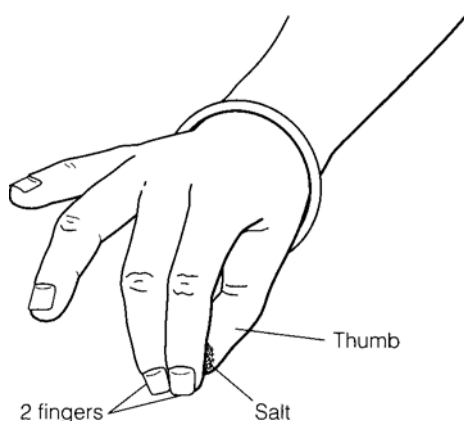
These are two treatments for diarrhoea which you can make if you have no oral rehydration salts for rehydration solution. These can help to prevent dehydration, or they can be used as an early treatment for dehydration. Sugar and salt solution and coconut water with a pinch of salt are suitable to give patients at home or on the way to the health centre. If a fold of skin goes back slowly after you pinch it, the patient needs a solution made up with oral rehydration salts.

Sugar and salt solution

1. Use an empty clean soft drink bottle with '330ml' written on the side. Use a clean plastic top of the bottle.
2. Pour three full bottles of water into a bowl. This is a litre of water.
3. Use water from a safe supply, such as a protected well, protected rainwater or tap water. If you use water from a river this should be boiled and cooled if possible.
4. Use the bottle top to measure the amount of sugar and salt. Put 10 full bottle-tops of sugar and one flattened bottle top of salt into the water.
5. Mix the water until the sugar and salt dissolve. The solution is now ready to drink.
6. You may prefer to measure the water using a cup. Most cups contain about 200 ml. Put five cups of water into a bowl. You can measure the sugar and salt with your hand. Take one scoop of sugar in your hand but do not use your little finger (Picture 56). Pinch the salt with two fingers and your thumb (Picture 57).



PICTURE 56 How to measure a handful of sugar without using the little finger



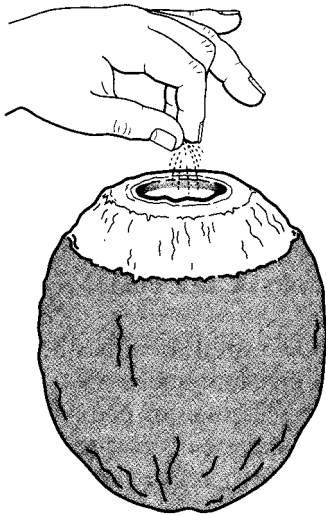
PICTURE 57 How to measure a 2-fingered pinch of salt

Appendix 12

Coconut water with a pinch of salt

Fresh coconut water does not need to be boiled. Coconut water with a pinch of salt is suitable for patients to use at home.

1. Take one young (green) coconut. Cut off the top.
2. Add one pinch of salt with two fingers and your thumb (see Picture 58) to the fluid inside the coconut.
3. Mix the coconut water by shaking it a little. The coconut water is now ready to drink.



PICTURE 58 *How to measure a 2-fingered pinch of salt into a young coconut*

APPENDIX 13 Polio

Polio is also called poliomyelitis. Polio is a virus infection which is passed on in faeces.

Prevention

Polio infection is prevented by:

- vaccination
- good hygiene.

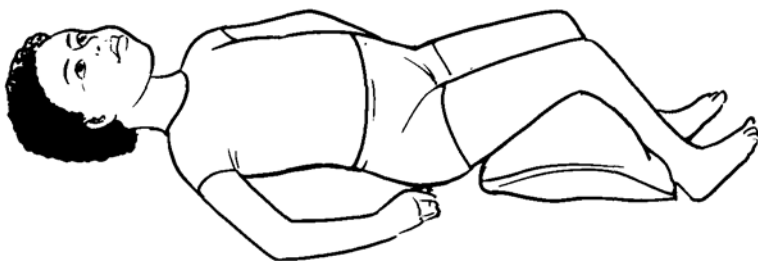
Polio vaccinations are given by mouth at birth, 6 weeks, 10 weeks, 14 weeks, and two more times between the age of 1 year and 5 years.

Signs and symptoms

1. Polio illness is usually very mild. The patient may have a sore throat, fever, headache and feel nauseated.
2. Sometimes, after 2 days, the patient has a more severe fever and has difficulty moving his leg or rarely his arm.
3. After 3 or 4 days, polio causes weakness which is worse on one side than on the other. The muscles become painful and floppy. In a few weeks, the muscles become small. The muscles may become less weak over the next weeks or months.
4. The patient may not be able to breathe because the breathing muscles are weak and he could die.
5. To prevent these severe problems:
 - Make sure that children are given the polio vaccine, even if they are slightly unwell.
 - Teach people to follow the six rules of good nutrition.
 - Only give injections when there is no other suitable treatment.
6. If a patient develops muscle weakness 3 or 4 days after a fever and has painful muscles, treat him for acute polio.

Treatment of acute polio

1. Rest in bed until there has been no fever for 5 days. This may take 15 days.
2. Do not give any injections.
3. Give paracetamol for pain.
4. Move the patient's feet so they are at right angles to the legs and slightly bend the knees. Support the knees from behind using a pillow. The hips and back should lie flat. The arms should be slightly bent.



PICTURE 59 *Position for acute polio treatment*

5. Physical therapy should be done regularly after 5 days without a fever. All the joints and muscle groups should be moved several times a day.
6. Ask the patient to blow out a candle or match. If he cannot blow out the candle or match, he has difficult breathing. If he has difficult breathing, use a tube to suck away fluids from the back of the throat. Put in a nasogastric tube to give liquid food.

Appendix 12

Treatment of polio after the fever and pain have gone

1. Move the muscles and joints several times each day. This will prevent the legs (or arms) from becoming bent forever.
2. Help the patient to stay active and independent. Walking aids or wheeled boards or chairs are helpful.
3. Tell the patient that there may be improvement in their movements for up to 18 months. It is important for someone to help them to move their joints regularly.
4. Some children will need help for several years to allow them to be as active and independent as possible.
5. The child should still be given all the usual vaccinations.

When not to diagnose polio

It can be easy to confuse polio with other illnesses that cause similar symptoms. Remember that polio does not cause problems with the feeling in the legs or arms.

If a patient has weakness:

- Look on the patient's skin for a tick. If you find a tick cover it with vaseline or oil. Wait for the tick to fall off. This may take 2 hours. Do not pull the tick off.
- Look for bite marks. The patient may have rabies.

If many people have weakness:

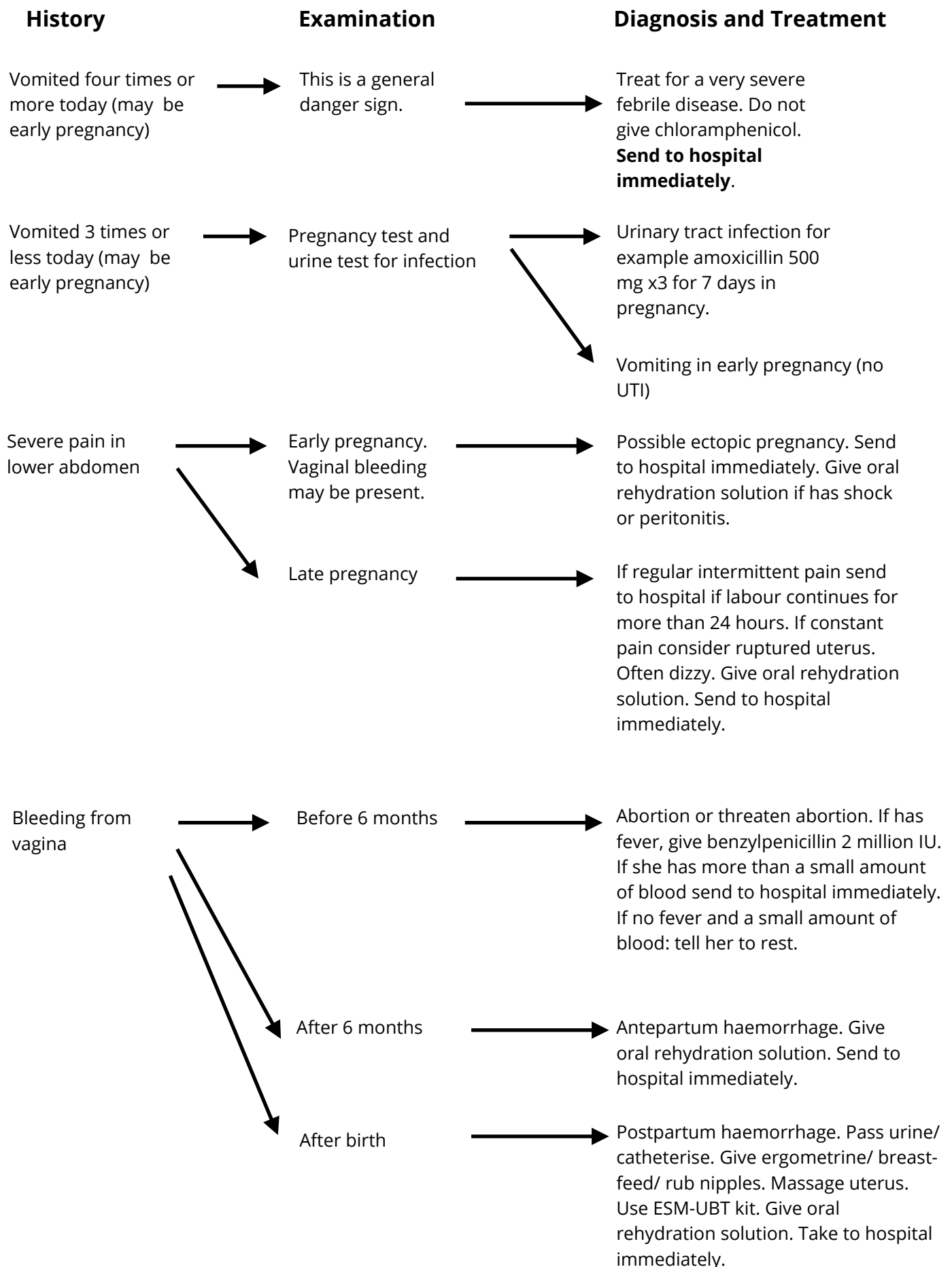
- Find out what they have eaten. Toxins in food can cause weakness. Botulin toxin, bitter cassava or grass pea poisoning are common.

Appendix 14

How to treat a woman with pain in the lower abdomen or unusual discharge from the vagina

Problem	Detail	Treatment
1. Heavy periods Bleeds for more than 8 days or Very wet pad in less than one hour	Does not want to delay pregnant	Ibuprofen 400 mg three times a day when bleeding or pain present
	Wants to delay pregnancy	Contraception options. For example the combined oral contraceptive pill
2. Painful periods	Younger (less than 45 years)	Sexually transmissible infection clinic
	Older (less than 45 years)	Gynaecology clinic
3. Sexual intercourse painful or bleeding with intercourse	Younger with pain in lower abdomen	Send to hospital where operations are done. Possible ectopic pregnancy
4. Unusual discharge	Older - last period more than one year ago. Now bleeding again.	Gynaecology clinic
5. Last period more than 6 weeks ago	Check for fever and sepsis. Consider unsafe abortion.	No fever, no sepsis, mild bleeding, mild pain: Rest, no sex. Hospital if unwell.
6. Irregular vaginal bleeding or new bleeding in an older woman	Vaginal bleeding not settling after miscarriage or termination	Possible retained products of conception. Send to hospital.
7. A woman who is less than 23 weeks pregnant has vaginal bleeding or lower abdominal cramps or pain.		

Appendix 15 How to treat obstetric problems



How to treat obstetric problems

History	Examination	Diagnosis and Treatment
Something hanging from vagina	Prolapsed umbilical cord	Very gently replace the cord in the vagina to avoid spasm of the blood vessels. Put bottom higher than head eg kneeling position. Send to hospital immediately.
Convulsions	If still having a convulsion	Suspect Eclampsia. Diazepam 10 mg rectally. Put on side. Magnesium sulphate 5 g in each thigh muscle. Send to hospital immediately.
	Convulsions have stopped	Magnesium sulphate 5 g in each thigh muscle. Send to hospital immediately.
Tired or palpitations	Pale conjunctivae	If less than 7 g/dl send to hospital for transfusion.
	Measure haemoglobin (if possible)	If 7 to 10 g/dl: Test for malaria. Mebendazole if has large number of hookworm eggs in faeces (not in first 3 months of pregnancy). Ferrous sulphate 200 mg three times a day for 3 months or more.
Headache or no symptoms	Diastolic blood pressure 100 mmHg or higher Check urine for protein	Pre-eclampsia. Send to hospital immediately. The baby may need to be delivered urgently.
Spontaneous rupture of membranes	Less than 37 week gestation	Preterm premature rupture of membranes. Send to hospital. Steroids if less than 34 weeks.
	More than 37 week gestation	Spontaneous rupture of membranes. Send to hospital if no contractions.

APPENDIX 16 Diabetes

A person with diabetes is not able to take glucose out of the blood.

Some patients with diabetes may not have enough insulin.

There are two main types of diabetes:

- Type 1 diabetes is also called insulin-dependent diabetes. Type 1 diabetes usually affects children and young adults. Patients with type 1 diabetes have to inject insulin.
- Type 2 diabetes is also called non-insulin-dependent diabetes. Type 2 diabetes usually affects older adults. Type 2 diabetes is treated by eating a healthy diet, being active, and often with tablets.

Most people with diabetes have type 2 diabetes. Type 2 diabetes is usually linked with being obese or overweight.

Very few patients in LMICs have type 1 diabetes.

Signs and symptoms

- Feeling thirsty all the time. Passing large amounts of urine.
- The patient may also lose weight.
 - Frequent skin infections and ulcers, especially if an ulcer is no better 2 weeks after beginning treatment.
 - If the patient has two of the following problems: - weight loss; - becomes tired easily with no obvious reason; - poor eyesight; - a yeast infection of the skin or oral candida.

Dip a urine sample for glucose if a patient has any of these symptoms. If the result shows glucose and they have lost weight (or their breath smells sweet): send them to hospital. If you have ketone urine dip tests and a patient has glucose and ketones (++ or more) send them to hospital immediately. These symptoms suggest a new diagnosis of type 1 diabetes. Many of the above symptoms can also be linked with an HIV infection. Consider doing an HIV test.

If a patient has symptoms of diabetes and their fasting (only water for the previous 8 hours) glucose blood test is 7 mmol/litre, or above, diabetes is confirmed. If the patient does not have diabetes symptoms, the fasting blood glucose would have to be 7 or above on 2 different days.

Patients with type 1 diabetes will become very ill if they do not use insulin, and will die at a young age if insulin is not available.

Patients with type 1 diabetes sometimes become very ill with diabetic ketoacidosis.

Both type 1 and type 2 diabetes damage the blood vessels.

Damaged blood vessels cause many problems:

- Blindness
- kidney damage
- myocardial infarction.
- gangrene (dead toes or feet)
- cerebrovascular incident
- nerve damage (*This type of nerve damage can cause burning pain which may need treatment with low dose amitriptyline - for example 5 mg or 10 mg at night*).

Because of the nerve and blood vessel damage, patients with diabetes and a skin ulcer need very careful treatment for the ulcer.

Treatment

1. Teach the patient to eat a mixed diet and to avoid sugar foods.
2. A low GI diet is a healthy option for type 2 diabetes.
3. Teach the patient to eat more food before working hard or exercising.
4. Patients with type 1 diabetes need to inject themselves with insulin every day. The patient gives herself injections into the fat underneath the skin.
5. Patients with type 2 diabetes may take tablets to help the body take sugar out of the blood.
6. If a patient who uses injections or tablets (not metformin) feels light-headed, sweats or acts strangely, put some sugar into their mouth. Give them some carbohydrate food as soon as possible.

7. Teach the patient to eat more frequently when they are ill. Carbohydrate drinks can be drunk when the patient is unable to eat. Tell the patient to drink carbohydrate drinks regularly until they are well again. Thin maize porridge is an example of a carbohydrate drink. They should continue to take their tablets or to give themselves injections as normal.

8. Advise all patients not to smoke.

9. Advise all patients to take regular exercise.

10. Healthy heart advice is very important for people with diabetes.

11. Sulphonylureas such as glibenclamide, gliclazide, glimepiride and tolbutamide, lower blood sugar for patients with type 2 diabetes, but they do not reduce the chance of a patient having a heart attack or any other complication from diabetes. They should only be used to control symptoms of type 2 diabetes such as thirst.

12. Metformin tablets, SGLT2 inhibitor tablets and GLP1 agonist injections all reduce blood glucose, protect the heart and reduce weight gain for people with type 2 diabetes. Metformin is likely to be the only realistic choice in low resource settings (SGLT2 inhibitors and GLP1 agonists are expensive).

Appendix 23, "How to reduce your chance of heart attack and stroke", gives you an idea of the benefits of each lifestyle and medication option. Blood pressure control is particularly important if you have diabetes. Losing weight, if you are overweight with type 2 diabetes, is very effective at improving the diabetes and protecting the heart. Taking a statin medicine can also protect against heart attacks and strokes. <https://alpha.patientcentre.org/calc/> will support patients with type 2 diabetes to make lifestyle and medication choices with your support. Blood pressure control (with tablets if needed) and statins are just as important as taking metformin to protect people with diabetes from heart attacks and strokes.

When to send patients with Type 1 diabetes to hospital immediately

- Too much sugar in the blood may cause a patient to become unconscious. If a patient with diabetes is ill, and their breath smells sweet, give them an injection of six units of insulin if possible. Give them oral rehydration solution (use a nasogastric tube if they are unconscious), 5 ml each minute, on the way to the hospital. This is the correct treatment for both low blood sugar and diabetic ketoacidosis.
- Low blood sugar can also cause a patient to become unconscious. Warning symptoms of low blood sugar include: sweating; anxiety; dizziness; and feeling shaky. Low blood sugar can be caused by injecting too much insulin, not eating enough food, or doing too much exercise in patients with type 1 diabetes. Try putting sugar under their tongue. If the patient regains full consciousness, the only reason for going to hospital would be to get advice about getting the right balance between how much food to eat, how much activity to do and how much insulin to inject.
- If a patient with type 1 diabetes has had too much insulin or if they have been drinking too much alcohol without eating their blood glucose level can become dangerously low. Check their blood glucose level if possible. If their blood glucose level is less than 4 mmol/l (70 mg/dl) they should be treated with oral rehydration solution (possibly using a nasogastric tube) or even sugar under the tongue.
- If a patient is unconscious, or lethargic, despite being awake, or if they move less than usual when awake: consider treating ill patients with type 1 diabetes for very severe febrile disease before sending them to hospital. They will also need insulin (for example 6 units under the skin), and fluids: for example oral rehydration solution (possibly using a nasogastric tube).

When to use medication for type 2 diabetes:

Almost all patients with type 2 diabetes will choose to start metformin. It is a very safe medication. If the patient has symptoms with diabetes (thirst, passing a lot of urine, weight changes) please check

that they don't have type 1 diabetes (see above - ketones in the urine, a particularly high blood glucose and recent weight loss suggest type 1 diabetes).

If the patient has symptoms of diabetes and does not have type 1 diabetes please start them on metformin straight away (unless they have severe kidney failure).

The dose of metformin will need to be increased very slowly to avoid side effects (loose stool or nausea). Start by taking 1/2 a 500 mg tablet with the main meal.

Increase the dose very slowly, for example the dose can be increased every month by 1/2 a tablet. So after one month the patient will be taking 1/2 a tablet with 2 main meals per day.

If the patient gets side effects consider dropping the dose.

Finally the patient will aim to get the dose up to 500 mg with each main meal (for example 500 mg, 2 or 3 times a day).

Metformin reduces the sugar levels, but mostly it protects the blood vessels and prevents strokes and heart attacks. If the patient has bad side effects consider giving them 1/4 tablet with each meal. Again increase the dose very slowly.

Please read appendix 43: Type 2 diabetes clinic protocol.

APPENDIX 17 How to interpret urine results

Some clinics will have urine test strips and some may have a microscope.

White blood cells or Nitrites

White blood cells in the urine often mean that the patient has a urinary tract infection. However, many sexually transmissible infections also cause white blood cells in the urine. Check that these patients do not have symptoms of a sexually transmissible infection (unusual vaginal discharge, pain during sexual intercourse or vulva sores).

Nitrites on a test strip are caused by a urinary tract infection.

Red blood cells

Red blood cells in the urine can be caused by :

- Blood from inside a woman's uterus if she is having her period.
- A kidney stone if the patient has severe pain in area 3 or area 9 of the abdomen. (See Lesson 8.)
- A urinary tract infection. There will also be a lot of white blood cells in the urine. Nitrites on a dipstick test are caused by a urinary tract infection.
- Schistosomiasis (Bilharzia). There will often be schistosomiasis eggs in the settled urine. If you think a patient may have schistosomiasis, in an area where schistosomiasis is common:
 - Give a single dose of praziquantel, 40mg for each kg body weight.
 - Examine the urine again after 2 to 3 months.
- If schistosomiasis is uncommon:
 - collect the urine between 12 noon and 2 pm. Allow the urine to settle for about 2 hours. Next, examine the sediment with a microscope, and look for the *Schistosoma haematobium* eggs.
- Nephritis, which is a disease of the kidneys.

Nothing

If nothing is found in the urine the patient may have:

- Dark concentrated urine from not drinking enough.
- Sexually transmissible infection (STI) - consider sending the patient to a sexually transmissible infection clinic (see appendix 25 and appendix 26).
- Irritation of the urethra - this is sometimes caused when a woman has sexual intercourse if the vagina is not lubricated (this may be because of lack of sexual excitement, or lack of foreplay), or if she uses soap or herbs in her vagina. Tell her that using soap or herbs in her vagina increases her chances of catching HIV. She will also pass urine frequently. Advise her to drink plenty of water.
- If she has an itchy vagina and vulva and perhaps a white vaginal discharge she may have vaginal thrush. Treat with a single dose of fluconazole 150mg on one occasion by mouth; or with clotrimazole 500 mg vaginal tablet applied inside the vagina on one occasion.
- Pinworms (also known as threadworms) - if the patient is a girl who complains that her private parts or anus itches she may have pinworms. Boys and adults also get this problem. Treat with albendazole 400 mg on one occasion. Advise patients to wash their hands with water and soap or ash, especially before they eat and after they use the latrine. Treat the whole family if possible.

APPENDIX 18 How to treat a patient with abdominal pain or with blood in the faeces

Questions

1. Do you have any problems when you pass urine?
2. Are your bowels all right?
3. When was your last normal menstrual period? Does your pain come at the same time as your period? Do you feel pain when you have sexual intercourse?
4. Show me where you feel the pain.
5. What type of pain do you feel? Is the pain constant or intermittent?
6. Is there anyone else at home who has the same symptoms that you have?

If passed loose or watery faeces three times or more this morning. Look at diarrhoea chart (Appendix 10)

Examination

1. Look for fever, anaemia and jaundice.
2. Look for swellings and tenderness.
3. Look for guarding or rebound tenderness.

Examination normal:

1. Pain passing urine or passing urine frequently. Give amoxicillin if pregnant. **Send others to have urine examined.**
2. Not able to pass urine. In pain. **Send to hospital immediately.**
3. Last normal period more than 6 weeks ago, **and** abdominal pain. **Send to hospital immediately.**
4. Gastroenteritis or food poisoning **and** no dehydration **and** passed faeces less than six times today. Home treatment for diarrhoea.

Examination findings and diagnosis

Fever:
In malaria areas test for malaria or treat with first-line malaria treatment.

Anaemia: Send immediately to hospital if has fast breathing or swollen legs.

Jaundice: Send immediately to hospital.

Swellings:

1. Woman with large abdominal swelling and pain in area 6 or low back. This is labour if the pains are regular.
2. Patient with swelling near centre of abdomen and pain. This may be intussusception.
3. Patient with painful swelling near private parts. This may be an incarcerated hernia.
4. Patient with swollen abdomen and pain. This may be a volvulus.
5. Rectal prolapse. Use vegetable oil. Push back into anus.

If labour lasts more than one day and one night or woman has been pushing for more than 2 hours.

Any patient who may have an intussusception, incarcerated hernia, a volvulus or a rectal prolapse.

Tenderness:

In area 12 may be a peptic ulcer or gastritis.
In area 3 or 9 may be a kidney infection.
In area 5, 6 or 7 may be pelvic inflammatory disease or a urinary tract infection.
In area 10 or 11 may be hepatitis.

Pain in area 12 for 2 weeks or more.

All patients with fever and pain in area 3 or 9.

If there is pain in area 5, 6 or 7 and the pain is made worse by sexual intercourse send to the sexually transmitted disease clinic with partner.

If there is pain in area 10 or 11 **and** fever or jaundice send to hospital immediately.

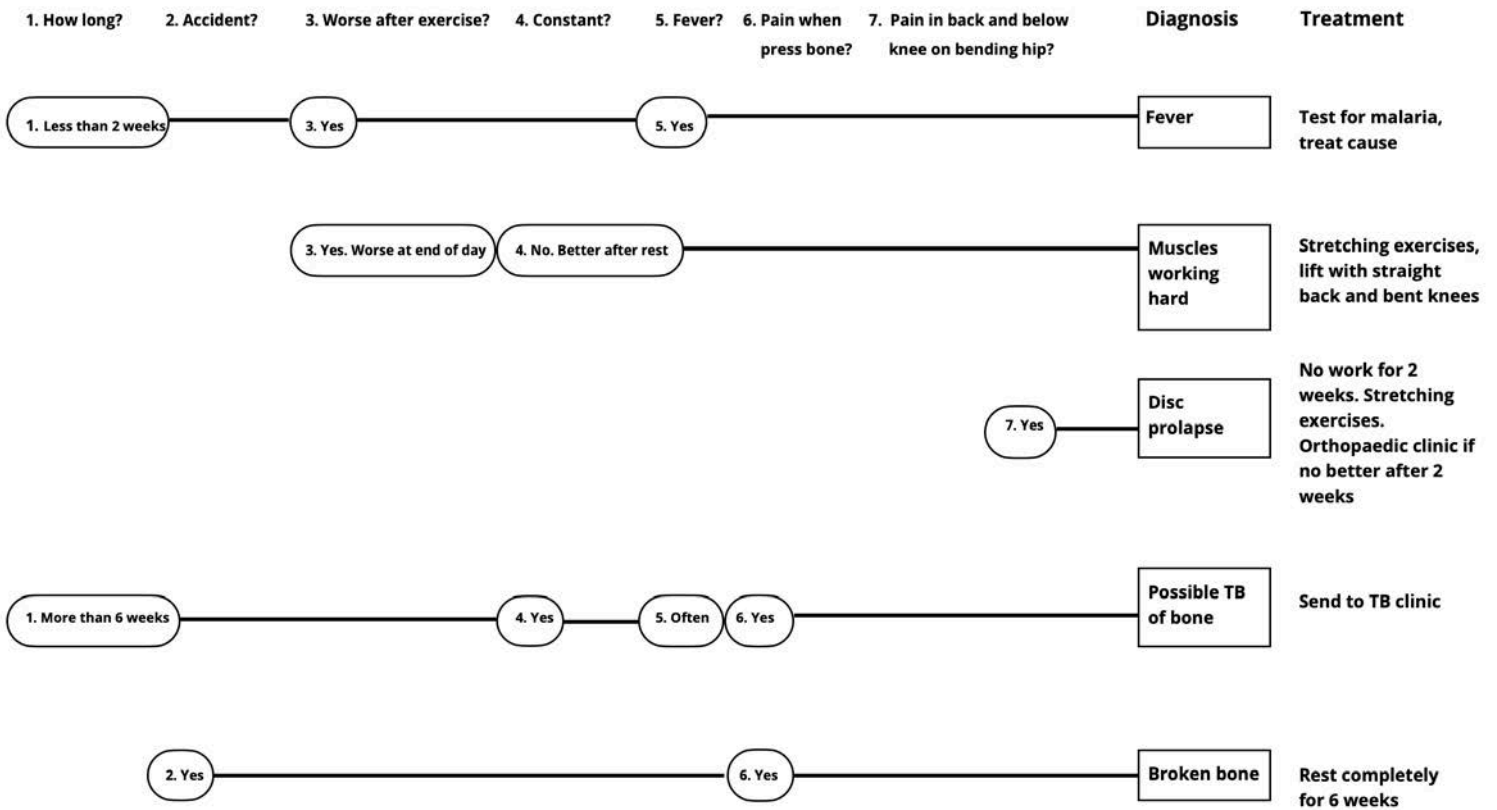
Guarding or rebound tenderness. The patient has peritonitis. Peritonitis may be caused by appendicitis, a perforated gastric ulcer, intussusception, an incarcerated hernia, an ectopic pregnancy, pelvic inflammatory disease, typhoid or a volvulus.

All patients with peritonitis. If the patient may have an ectopic pregnancy give her 5 ml of oral rehydration salts solution every minute.

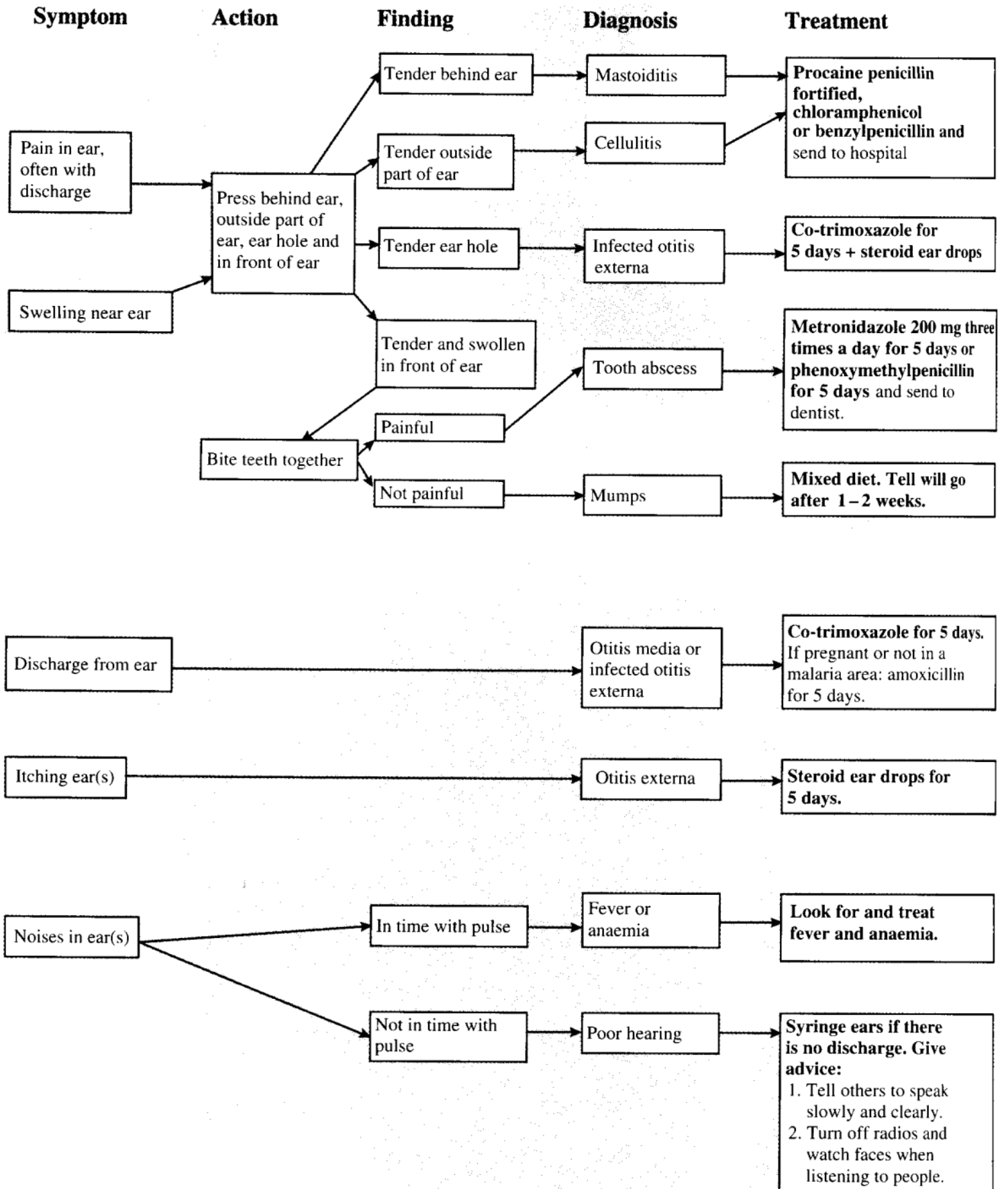
Send to hospital

If no better 2 days after starting first or second-line malaria treatment.

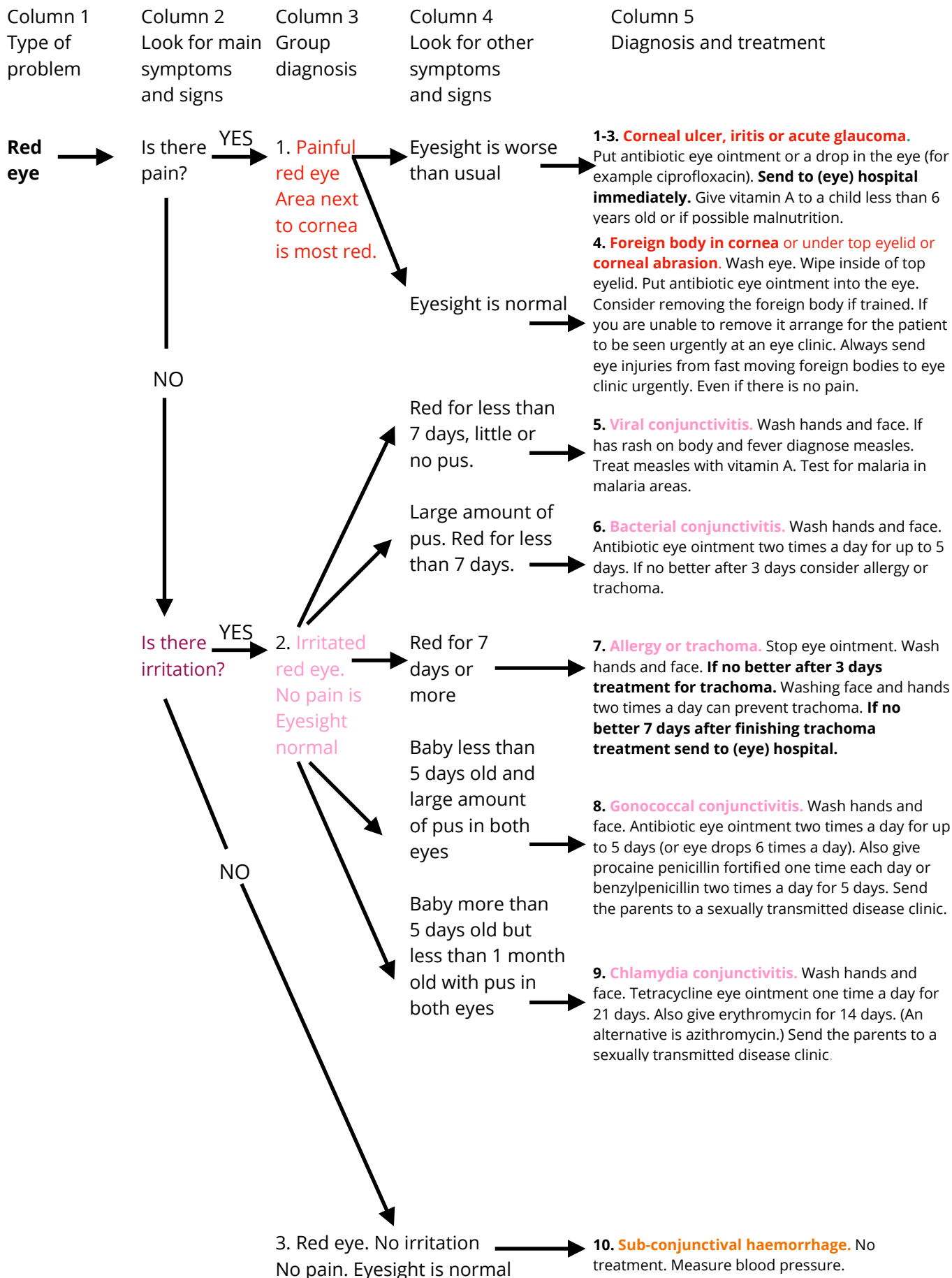
Appendix 19 How to diagnose the cause of back pain



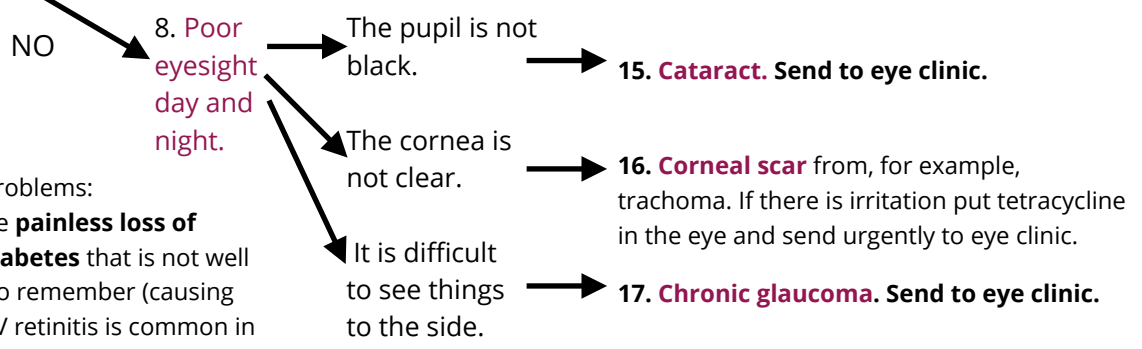
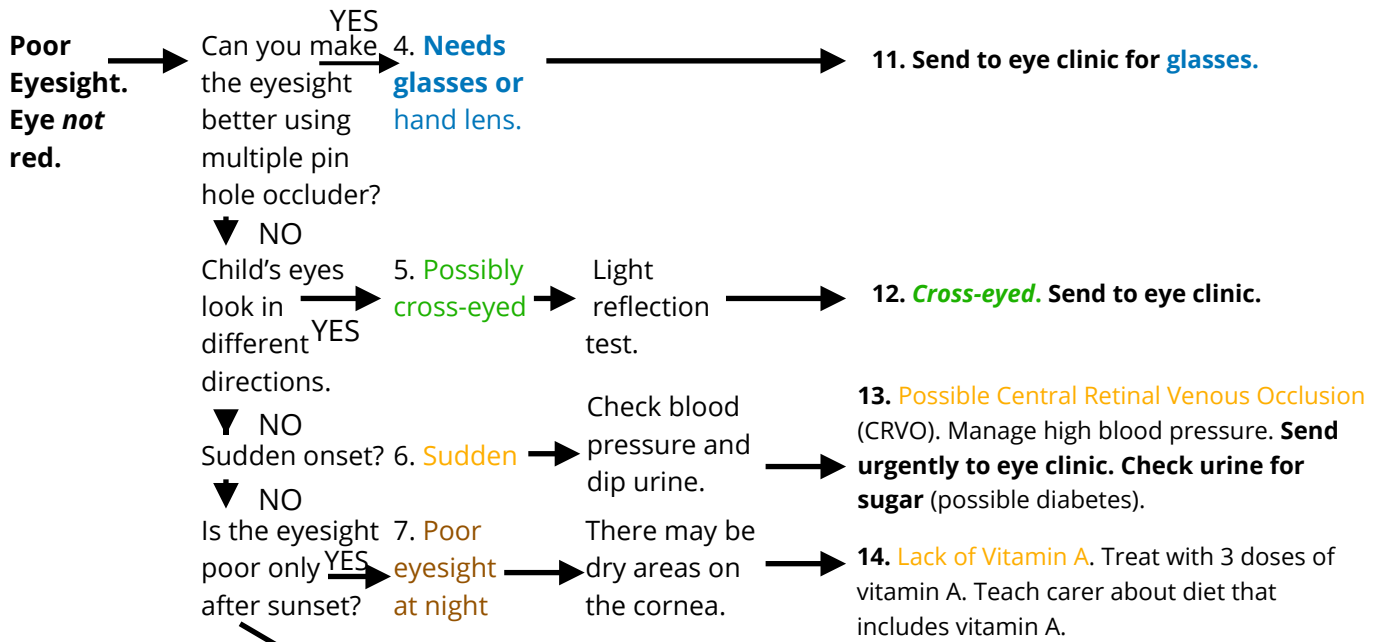
APPENDIX 20 How to treat an ear problem



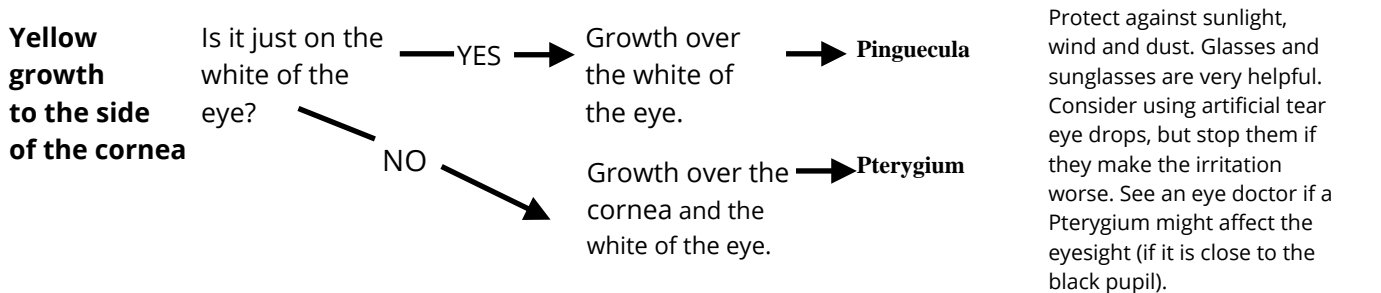
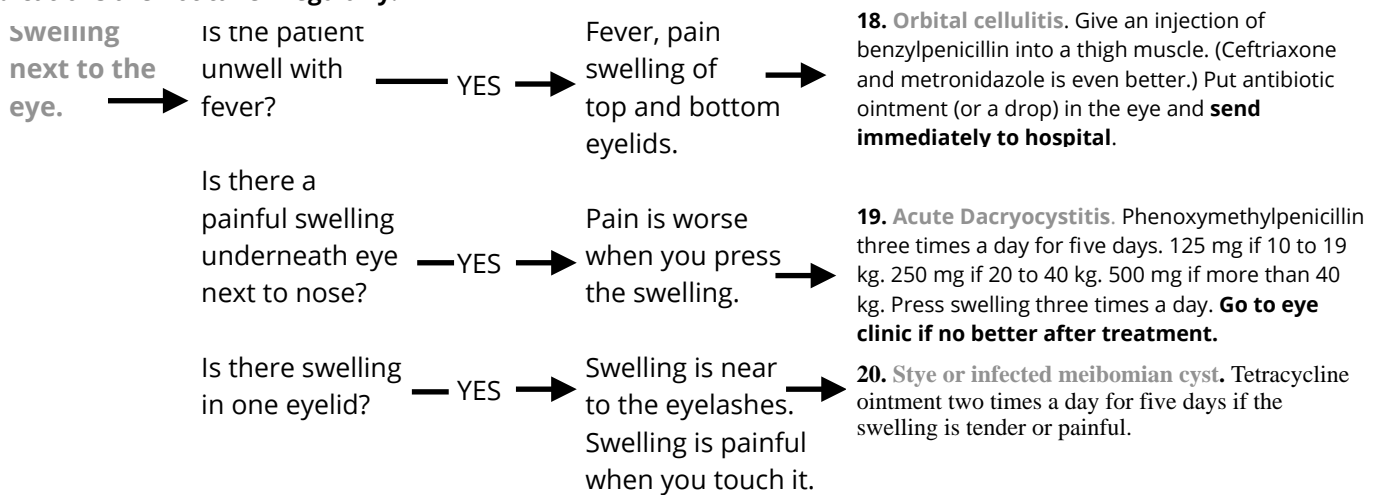
Appendix 21 How to treat an eye problem



Column 1 Type of problem	Column 2 Look for main symptoms and signs	Column 3 Group diagnosis	Column 4 Look for other symptoms and signs	Column 5 Diagnosis and treatment
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Eye problems in other health problems: Many other problems can cause **painless loss of sight with a gradual onset.** **Diabetes** that is not well managed is an important one to remember (causing retinopathy and cataracts). **CMV retinitis** is common in **HIV if medications are not taken regularly.**





A Pinguecula

APPENDIX 22 COVID-19

Symptoms of COVID-19

Although it is important to test for malaria in many countries if someone has a fever, many viral infections, including COVID-19 cause a fever in the first few days. Typically, new variants of COVID 19 cause a sore throat, a runny nose and a headache. Fatigue and sneezing are also common. Early variants of COVID cause either a cough (70% or less) and / or a loss of the sense of smell or taste (approx. 40%). COVID-19 can also cause a headache (25%), widespread muscle pain (17%), tiredness (30%), a sore throat (16%), sputum production (18%), diarrhoea or vomiting (20%) or a runny nose (8%). Shortness of breath can happen (15%) in the first week of COVID-19, but it is more typical 5 to 13 days after symptoms have started. If a patient describes that they can't get enough air into their lungs this is usually an anxiety related symptom, rather than a symptom directly caused by COVID-19. Check their oxygen saturation to reassure them if possible, or examine their chest.

Testing for COVID-19

Near patient (lateral flow) tests are typically not good at picking up COVID-19 in the first day of symptoms. So test on day 2 onwards. False negative tests are common. If there is a lot of COVID about, and the lateral flow test is negative do not be confident that it is not COVID.

PCR tests are more sensitive than lateral flow tests, but even PCR tests can still give a falsely negative result! Whilst COVID-19 is common: If the history suggests COVID-19 and a malaria test is negative and you can find no other cause for a fever tell the patient that they probably have COVID-19 (fever is present in 77% of COVID patients with early variants). Treat them with the national treatment for COVID-19 and advise them when to come back. They should watch for complications of COVID-19 and come back urgently if they have any of the complications. A PCR test will remain positive for some time after the patient recovers from COVID-19 even though they are no longer infectious. After a mild infection there is usually no need to repeat a COVID test.

Treatment of patients with COVID-19 and COVID-19 complications

Tell patients with suspected COVID-19 to isolate for 7-10 days from the onset of symptoms. They should always wear a mask, or a visor, if they have to be in the same room as anyone else. They should keep at least 2 metres away from anyone else and wash their hands before touching anything that anyone else might touch.

Consider bringing vulnerable (high risk) patients back to see you on day 8 to check for complications. People with some long-term conditions, or who are older than say 50, may become very ill in the second, or third week, of a COVID-19 infection if the immune system becomes too active. Teach these patients to return urgently if they seem more poorly in the second week.

Breathlessness is one of the complications that typically affects patients 5 to 13 days after symptoms have started. Count their respiratory rate and if you can measure oxygen saturation, or listen to their chest, do so.

Patients with suspected COVID-19 complications, an oxygen saturation below 92%, fast breathing (consistently more than 25 breaths, per minute), or chest signs, should be given steroids* for 7 days and possibly antibiotics. These patients should also be referred urgently for specialist review.

Sepsis is also a complication of COVID-19. If a patient becomes very ill 5-13 days after having covid like symptoms, or testing positive for COVID-19, they may have COVID related sepsis. Treat them for a very severe febrile illness and consider giving them steroids for 7 days. Most of these patients should be sent urgently for specialist review.

COVID-19 increases the risk of clots in the lungs and elsewhere. Consider recommending aspirin 75 mg daily, from day 5 until day 14, for high risk patients (see below). Patients who are very unwell with COVID-19 may be given low molecular weight heparin injections subcutaneously.

People over the age of 50, and people with another long-term health condition, are at a much higher risk of having severe COVID-19 complications. These long-term health conditions include: obesity and diabetes; long term lung disease including severe asthma; heart failure; angina or heart attacks; untreated high blood pressure; chronic kidney disease or liver disease; cancer; stroke; and sickle cell disease.

COVID-19 vaccination is the safest and most effective way of preventing both COVID-19 infection and severe illness from complications. All types of vaccination are extremely safe. Until all vulnerable people are vaccinated it is sensible to wear a mask, and to wash hands to minimise transmission of the virus.

*Examples of steroid treatment for patients with an oxygen saturation below 92%, or another COVID-19 complication, are: dexamethasone 4-6 mg daily for 7 days; prednisolone 30-40 mg daily for 7 days (usually taken after breakfast). If you think there is evidence of pneumonia it may also be appropriate to use a 5 day course of antibiotics.

National treatments for COVID-19 in Zambia:

Treat fever with paracetamol (see our formulary for the dose). If this does not control fever, or muscle soreness, consider using ibuprofen. Also check for malaria and any other cause of fever.

Continue all treatments for HIV and TB and treat coexistent infections.

Optimise treatment of long-term conditions including blood pressure and heart failure.

Give steroid treatment for 7 days to those with an oxygen saturation below 92% or a complication from COVID-19. These patients should normally be given oxygen when available.

Treat symptoms consistent with pneumonia or sepsis (a very severe febrile disease) according to the guidelines in this manual.

Your clinician has given you this leaflet because your future risk of having a heart attack or stroke is higher than it should be, because of one, or more, of the following problems:

- High blood pressure You have diabetes You are overweight.
- You may have sleep apnoea syndrome (you fall asleep often during the day and snore badly)

Choose what you are capable of doing from the following list:

Use this website to find out what your future 10 year risk of a heart attack or stroke is and how much benefit each of the following options can give you: <https://alpha.patientcentre.org/calc/>

* If for example you currently have a 20% chance of having a heart attack or stroke in the next 10 years:

Move more, sit less (Increased physical activity)

25% Relative Benefit

* This treatment would prevent 5 people like you in 100 from having a heart attack or stroke over 10 years.

Potential harm of Intervention

- Potential for activity-related injury

Additional Benefits

- Less depression; Improves sleep quality; Improves osteoarthritis pain and function.

Healthy Eating and safe alcohol consumption (for example the Mediterranean diet, the low GI diet or the DASH diet and less than 14 units of alcohol per week)

30% Relative Benefit

* This treatment would prevent 6 people like you in 100 from having a heart attack or stroke in 10 years.

* Cutting back on alcohol will make it easier for you to lose weight if you are overweight, and will improve your emotional health and sleep.

Potential harm of Intervention

- No real harms

Smoking cessation

26% Relative Benefit

* This treatment would prevent 5 people like you in 100 from having a heart attack or stroke in 10 years.

* Quitting smoking gives these benefits. Cutting back makes very little difference.

* Cytisine seems the most effective aid to stopping smoking. It is cost effective and safe. Temporary adverse effects include nausea, vomiting and sleep disturbance.

Potential harm of Intervention

- Services for helping you to stop smoking may not always be available.

Atorvastatin 20mg daily

35% Relative Benefit

* This treatment would prevent 7 people like you in 100 from having a heart attack or stroke in 10 years.

Potential harm of Intervention

- Muscle and joint aches and stiffness are common (5-10 per 100 users) but are not appreciably more likely to happen with statins compared with placebo. Muscle soreness may be caused by the statin in perhaps 1 in 500 users
- 1 in 50,000 statin users will have severe muscle or kidney damage.
- Nausea, constipation or diarrhoea are common and often nothing to do with the statin
- Drug cost and the inconvenience of taking a tablet every day

Blood pressure medications (excluding atenolol and doxazosin) If your average systolic blood pressure is more than 140 mmHg (Tablets for blood pressure are usually best taken at night time.)

30% Relative Benefit (if you have diabetes: 50% Relative Benefit)

* This treatment would prevent 6 (or 10) people like you in 100 from having a heart attack or stroke in 10 years.

Potential harm of Intervention

- Types of side effects vary between medicine
- 1 in 10 people have to stop medication because of side effects
- Medication Cost

Metformin - if you have type 2 Diabetes

35% Relative Benefit if you have type 2 Diabetes

* This treatment would prevent 7 people like you in 100 from having a heart attack or stroke in 10 years.

Potential harm of Intervention

- Reduced appetite, mild nausea, loose stool. This is better tolerated with low doses increased very slowly. For example: start with half a tablet with the main meal and increase by half a tablet each month to 1 tablet with main meals (twice a day).
- Medication cost

- Lose weight if you are overweight. (Body mass index more than 27). Aim to reduce your waist size to half of your height.
- Ask your partner to watch you when you sleep (for half an hour). If your partner says that you stop breathing, tell your clinician, especially if you tend to fall asleep a lot during the day. Sleep apnoea syndrome causes high blood pressure and heart attacks. If you have sleep apnoea: it will often improve if you are able to lose weight and drink safely. Try the 16:8 eating plan.
- If you have high blood pressure: Do not add normal salt to your food when cooking or eating (but low sodium salt is good for you). Either eat a banana on most days or add low sodium salt to your food when cooking or eating.

Appendix 24 The Choking person

This is a short practical session. It would be useful to have a doll for demonstration and practice (or something that you can pretend is a doll eg a cushion). It is helpful to teach this session in small groups. For example 6 or less for each trainer.

Aim of session

By the end of the session, you will be able to make an assessment of a choking child or adult, know which of the 2 scenarios to follow, and be able to manage the child or adult appropriately.

Questions

- Why do people choke?
- What do they choke on?

Answers

- They try to swallow food before having chewed it.
- They put objects into their mouths whilst they are active.

Scenario 1: The person who can cough

- Majority of incidents
- Sudden onset of coughing
- The person is distressed

1. Sit the person up
2. Support them
3. Encourage them to cough
4. Keep encouraging them
5. DO NOT reach into their mouths

Scenario 2: The person cannot cough

- The person will be very distressed
- May have loud noise on inspiration (stridor)
- May not be able to breathe, or speak

1. If sat up – 5 back blows
2. Then see if anything dislodged
3. If possible, pick up and use gravity as do back blows
4. Look in mouth
5. Do not do blind finger sweep
6. If no response:
 - Aged 1 or over:
Do five abdominal thrusts = “Heimlich manoeuvre”
(see YouTube videos and picture on the right)
 - Under one year of age:
Turn over to lie on back and do 5 chest compressions
7. Assess if breathing
8. If not breathing, consider mouth to mouth and 5 rescue breaths
9. Repeat back blows and abdominal thrusts
10. If starts coughing, encourage to cough



Heimlich manoeuvre
for adults and larger children

Appendix 25

Sexually Transmissible infections - what do the symptoms mean?

Symptoms	Sexually Transmissible Infections - what do the symptoms mean?
Painless genital ulcer	Treat for early syphilis (unless pregnant in which case treat for late syphilis) and also for chancroid . Review all painless genital ulcers after 14 days.
Painless ulcer with swollen groin nodes	Treat for syphilis first. Consider also treating for lymphogranuloma , which is more rare.
Painful ulcer with, or without, swollen, tender groin glands	Herpes genitalis typically causes a painful collection of small blisters that quickly turn into an ulcer or ulcers. If this is a recurrence of typical blisters/ ulcers then treatment is often not necessary. If there is doubt about the cause (especially for a first attack) treat for chancroid. Chancroid painful ulcer, usually with swollen tender groin glands.
Vaginal discharge: coloured, or offensive smell NO abdominal pain	Treat for possible gonorrhoea and chlamydia unless testing is possible. If the discharge is smelly then consider adding metronidazole eg 2 g stat or 400 mg tds for 5 days (possible bacterial vaginosis or trichomonas). If the discharge is white, and not smelly, treat for thrush and review after one week.
Itchy white discharge (may smell yeasty) with sore vulva, or penis	Treat for thrush review after 1 week. If no better consider treatment for Sexually Transmissible Infection. Most white vaginal discharge is physiological (normal), not thrush.
Lower abdominal pain, pain on sexual intercourse and vaginal discharge	Possible Pelvic Inflammatory Disease (PID) - Treat for gonorrhoea and chlamydia and add metronidazole 400 mg bd for 7 days. It is important to make sure that this is not an ectopic pregnancy. Do a pregnancy test. If the pregnancy test is positive and she has lower abdominal pain, or tenderness, then the patient should see a doctor urgently.
Penile / urethral discharge	Treat for gonorrhoea and chlamydia
Swollen tender testicle or testicles	Orchitis. Treat for chlamydia and gonorrhoea The mumps virus can also cause orchitis. Suspect mumps if there has been swelling of the parotid glands in the previous week. Mumps needs no treatment apart from pain relief. A painless lump in a testicle might be testicular cancer. Arrange an ultrasound.
Tender epididymus	Epididymitis, Treat for chlamydia and gonorrhoea
Genital growths	Genital warts (Condylomata acuminata) - usually do not need treatment. If you are not sure ask a colleague. Secondary syphilis can present as flat growths (Condylomata lata) - This needs the same treatment as for early syphilis . If in doubt with warty growths treat for early syphilis. Molluscum have a typical appearance with a central dimple. No treatment is required. They usually disappear after months.

For all Sexually Transmissible Infections:

Don't forget to treat the partner(s) (not necessary for thrush). Advise either no sex until better or advise use condoms. Check HIV status and offer repeat testing 3 months after last exposure to risk.

Diagnosis or problem	Treatment options	With
Early syphilis Blood tests are often negative	Benzathine penicillin 2.4 MU im stat (not if penicillin allergic)	ciprofloxacin 500mg bd for 3 days (syndromic treatment for chancroid)
	Doxycycline 100 mg bd for 15 days (not if breast feeding or pregnant)	
	Ceftriaxone 1 g im for 10 days	
	Azithromycin 2 g orally on a single occasion	No need for ciprofloxacin
	Erythromycin 500 mg qds for 14 days	
Alternative for syphilis if no Benzathine penicillin available	Procaine penicillin 1.2 MU daily for 10 days for early syphilis and 20 days for late (or unknown duration) syphilis	ciprofloxacin 500mg bd for 3 days (syndromic treatment for chancroid)
Late syphilis (or unknown duration eg Positive syphilis test in pregnancy)	Benzathine penicillin 2.4 MU IM weekly x3 (not if penicillin allergic)	ciprofloxacin 500mg bd for 3 days (syndromic treatment for chancroid)
	Doxycycline (not in pregnancy) 100mg bd for 30 days	
	Ceftriaxone 1 g im for 10 days	No need for ciprofloxacin
	Azithromycin 2 g orally on a single occasion (does not cross the placenta)	
	Erythromycin 500 mg qds for 30 days (does not cross the placenta)	
If using azithromycin or erythromycin in pregnancy: Also treat the baby shortly after delivery since they do not cross the placenta.		
Lymphogranuloma venereum	Doxycycline 100 mg bd for 14 days (not if breast feeding or pregnant)	If fluctuant lymph node(s): aspirate with a white needle and syringe. Review after 2 weeks. If no better treat for Chancroid.
	Erythromycin 500 mg qds for 14 days.	
Chancroid	Ciprofloxacin 500 mg bd for 3 days	Review after 1 week. If no better treat for Lymphogranuloma venereum
	Erythromycin 500 mg qds for 7 days	
Gonorrhoea	Single 500 mg dose of intramuscular [IM] ceftriaxone (best choice)	
	Single dose of ciprofloxacin 500 mg oral	
	Single 240 mg IM dose of gentamicin	
Chlamydia	Azithromycin 2 g stat (best choice)	
	Doxycycline 100 mg bd 7 days (do not use in pregnancy)	
	Erythromycin 500 mg qds for 10 days	
Abbreviations: stat - once only (immediately) od - one time a day bd - twice a day tds - three times a day qds - four times a day		

Diagnosis or problem	Treatment options	With
Thrush - vaginal candida	Fluconazole 150 mg stat orally (not in pregnancy)	Partner treatment is generally not necessary.
	Clotrimazole pessary 500 mg stat. Inserted into vagina before sleep	Review after one week. No sex until better.
	Miconazole pessary 1200 mg stat. Inserted into vagina before sleep. Or 200 mg pessary at night on 3 days.	If symptoms persist or recur frequently: check HIV status, check urine or blood to exclude diabetes.
Possible Pelvic Inflammatory Disease (PID)	Treat for gonorrhoea and chlamydia and add metronidazole 400 mg tds or 500 mg bd for 7 days then review. It is important to make sure that this is not an ectopic pregnancy. Do a pregnancy test. If the pregnancy test is positive and she has lower abdominal pain, or tenderness, then the patient should see a doctor urgently.	The patient may need a further 7 days of doxycycline and metronidazole. Normally you would only use a single IM dose of ceftriaxone or gentamicin
Herpes genitalis	Aciclovir 400 mg tds for 5 days or Valaclovir 500 mg bd for 5 days for the first episode.	If there is doubt about the cause (especially for a first attack) treat for chancroid)
	If this is a recurrence of typical small blisters/ulcers then treatment is often not necessary.	
Genital warts Condylomata acuminata	Usually do not need treatment	Refer for colposcopy if only has cervical warts. Ask a colleague if these could be condylomata lata (early syphilis).
Flat growths Condylomata lata	Treat for early syphilis	
Vaginal discharge: coloured, or smelly NO abdominal pain	Treat for possible gonorrhoea and chlamydia unless testing is possible.	If the discharge is smelly then consider adding metronidazole eg 2 g stat or 400 mg tds for 7 days (possible bacterial vaginosis or trichomonas). Or tinidazole 2 g stat.
Penile / urethral discharge	Treat for gonorrhoea and chlamydia	If no better after 1 week consider treatment for trichomonas vaginalis eg metronidazole 2 g stat.

Diagnosis or problem	Treatment options	With
Pregnant women	Ciprofloxacin is thought to probably be safe in pregnancy. But do not use as the first line treatment for uncomplicated UTIs. Treat STIs with ciprofloxacin if the risk of infection outweighs the risk of treatment. Avoid doxycycline.	
Children eg neonatal conjunctivitis	Gentamicin 5 mg/kg/day IM or IV for 2 days for gonorrhoea Ceftriaxone 25-50 mg/kg body weight IV or IM in a single dose, not to exceed 250 mg for gonorrhoea	Erythromycin 50 mg/kg/day oral in 4 divided doses for 14 days for chlamydia Also lid cleaning with saline or water and tetracycline eye ointment bd for 5 days (both eyes) If also septic add either: Procaine penicillin 50,000 U/kg IM daily, (50-100 mg/kg/day) for 7 days or Ampicillin (IM or IV) or amoxicillin orally (both 50 mg/kg bd) for 7 days

For all Sexually Transmissible Infections:

Don't forget to treat the partner(s) (not necessary for thrush).

Advise either: no sex until better; or advise use condoms.

Check HIV status and offer repeat testing 3 months after last exposure to risk

Consider syphilis screen



Genital warts



Painless genital ulcer of Syphilis

Appendix 27 Epilepsy - patient and relative information

What is Epilepsy?

Patients with epilepsy have convulsions (also called fits or seizures). Convulsions can be caused by many other illnesses, such as any very severe febrile disease. If a person has a first-ever convulsion, seizure or fit they should see a clinician urgently. If a child has abnormal movements, or is not developing well, or more seizures than usual, they should also see a clinician.

Epilepsy is usually caused by damage to part of the brain. Often the damage to the brain is very minor. In fact most doctors use the word epilepsy only if there is no obvious cause for a patient's seizures. Epilepsy is not an emotional health illness. However, many people *wrongly* think that people with epilepsy have a mental illness, or that epilepsy is caused by evil spirits. Both of these ideas are wrong. Epilepsy is not contagious.

People with epilepsy are neither prone to violence, nor are they mentally disabled. Epilepsy does not affect your intelligence.

Alcohol

Some people may get convulsions because they drink alcohol in a harmful way. Drinking too much alcohol causes convulsions in some people. Or if you too drink too much alcohol for many days and then suddenly stop drinking, you might have a convulsion from alcohol withdrawal. If you drink excessively for more than a few days, it is safer to stop your drinking slowly. For example halve your drinking each week.

Avoid things that might make seizures more likely: alcohol; drugs, lack of sleep; flashing lights.

What to do if you know you are about to have a seizure, or if you see someone having a seizure:

If you get a warning that you are about to have a convulsion:

Try to put yourself into a safe position.

If you are driving, or on a road: Stop driving and take yourself off the road.

Lie on your front, with your face to the side. The picture (below) shows you how to lie. This will protect your lungs and make sure that you can carry on breathing safely.

If you are having more convulsions than usual: you should see your clinician urgently.

Driving and dangerous activities

Don't drive a car, lorry or motorcycle unless you have not had a convulsion for more than 2 years. In some countries this may be 3 years. If you have no warning before a convulsion: perhaps you should not handle fire or boiling water. Riding a bike, or swimming, can be dangerous if you get no warning before a convulsion. Epilepsy may prevent you from safely doing some jobs. For example it would not be safe to work at heights with epilepsy.

If you have had no convulsion for 2 years, or more, you might consider slowly stopping your epilepsy medicine with clinician support. But if you have a further convulsion: you will have to stop driving for at least another year.

Epilepsy medicines

Epilepsy medicines prevent convulsions by reducing the abnormal electricity in the brain. But they need to be taken for a very long time. Common medicines for epilepsy are lamotrigine, carbamazepine, phenobarbital or phenytoin. Take the medicine every day. Please make sure that you do not run out of medicine. This might mean coming to the clinic or pharmacy every month or two. If the medicine is

causing problems please go back to clinic. Giving treatment that is not from the clinic may be harmful. Please discuss this with the clinic.

Children with epilepsy should normally be able to go to mainstream schools and participate in most sports and do most jobs and occupations. Teachers and sports supervisors may need training to manage a convulsion. Family and friends should know about the problem.

The Pill and pregnancy.

Some epilepsy medicines can interfere with how well contraceptive pills work. Check with your doctor that you are taking the right contraceptive. Pregnancy rarely makes any difference to epilepsy but some epilepsy medicines are not safe for the unborn child. You should not use sodium valproate if you plan to become pregnant. You should take extra folic acid around conception and for the first 12 weeks of your pregnancy. Getting married and having children should be encouraged if that's what the person wishes.

Preventing seizures

It is possible to avoid having seizures. But not all seizures are preventable.

If you have epilepsy certain triggers can make a convulsion more likely. Avoid the following:

- Make sure that you do not run out of your epilepsy medicine
- Don't drink alcohol in a hazardous or in a harmful way. 15 units or more of alcohol per week is hazardous. Avoid having a binge of alcohol. 6 units or more of alcohol in a single day is a binge.
- Missing out on too much sleep or get too stressed can trigger a seizure.
- Taking recreational or street drugs can cause a seizure.
- Some medicines such as certain antidepressants can make seizures more likely if you have epilepsy. Check with your doctor.
- Occasionally heavy or painful periods (menstruation) can trigger a seizure.
- Any illness that causes a fever, a high temperature, can trigger a seizure.

How to treat a patient who is having a convulsion

If someone is having a convulsion move them patient to a safe place. Do not restrain them. Calmly tell other people what is happening. Loosen any tight clothing near the neck. Do not put anything in the mouth. The patient will not swallow their tongue. If they vomit, turn them immediately on their side. As soon as possible (perhaps after the shaking has subsided), lay the patient on their side, in the coma position. This will help them to breathe. They will often need to sleep after a convulsion.

If a convulsion lasts more than 5 minutes take the patient straight to the health centre. Sometimes the patient may need to sleep for more than an hour after a convulsion. But if you can not wake them up after this it is sensible to make sure that they do not have any other illness. If in doubt see a clinician urgently.



PICTURE *The coma position*

Medications to prevent seizures include Levetiracetam and Carbamazepine

Levetiracetam (also known as Keppra) is a commonly used medication to prevent convulsions.

Levetiracetam is generally a safe and effective medicine to prevent convulsions. It is common to have mild headaches or to feel a little tired with Levetiracetam. Sometimes it can cause a blocked nose or an itchy throat. Rarely it can cause a dangerous blistering rash or serious changes in your mood. If you feel very dizzy or unwell please see your clinician

Carbamazepine is another medicine to prevent convulsions.

Carbamazepine is generally a safe and effective medicine to prevent convulsions. Rarely carbamazepine can harm the bone marrow. Your bone marrow makes white blood cells that help to fight infection. If you have symptoms of an infection (for example a fever or a bad sore throat) it is especially important to see a clinician urgently. Tell the clinician that you take carbamazepine. If you have nasty sores in your mouth see your clinician urgently.

Other medications may produce side effects.

The most common side effects are those related to the dose of the medicine. You may become drowsy, lose coordination, have a headache, lose your appetite or feel nauseated. You might drool, have a tremor, gain or lose weight, experience double or blurred vision, or dizziness. Your concentration or memory may be affected. If you have a new rash, please show the rash to your clinician.

Appendix 28 Tetanus

Tetanus is caused by a type of bacteria called *Clostridium tetani*, that produces toxins. The toxins affect the nerves that control muscles. The toxins cause persistent and dangerous muscle spasms. The bacteria live in soil everywhere. If a wound is dirty it can allow the bacteria to grow. It usually takes about a week to cause symptoms. Usually the first sign of tetanus is lock jaw, where the patient has spasms of the muscles of the face and jaw.

Prevention

Tetanus infection is prevented by:

- vaccination
- good hygiene and wound care, including the umbilicus of newborn babies.

Tetanus vaccinations are given by injection at 2, 3 and 4 months, as part of the DTP (Diphtheria, Tetanus and Pertussis) vaccine.

Pregnant women are vaccinated twice in pregnancy (4 weeks apart).

The World Health Organisation recommend a total of 6 vaccines during childhood and adolescence. A total of 5 vaccinations is felt to give life-long immunity in most people.

Refer to your country's vaccination schedules for further information on this.

If a patient has not had a tetanus vaccination within the last 10 years (and they have had less than 5 tetanus vaccinations in their lifetime) a tetanus booster should be given when they come for wound care.

Signs and symptoms

- After lock jaw the patient may suffer spasms of the muscles in the neck, chest, abdomen or arms or legs. Generalised spasms with opisthotonos are more likely as the illness continues. It may worsen over the course of 10 days.
- Spasms are made worse by noise and other triggers. The spasms last for minutes and are painful as the patient is fully conscious.
- Difficulty breathing can cause death. 60% of patients with severe tetanus may die. Consider tracheostomy.
- Tetanus can cause high blood pressure, a fast heart rate or a fever. Consider tracheostomy.
- It may take up to 4 weeks to recover.

Neonatal tetanus

- Neonatal tetanus presents typically at between 2-10 days of age. The baby feeds well and cries normally for 2 days. The child then develops general weakness and floppiness. They become irritable and reduce feeding because they cannot suck. This progresses to whole body spasms, "convulsions", opisthotonus and autonomic instability (high blood pressure, fast or slow heart rate, fevers, profuse sweating).
- Death occurs in up to 90% of cases if not recognised and treated.

Treatment of acute tetanus

The diagnosis is usually made based on typical symptoms and signs.

1. Give an injection of tetanus immunoglobulin 500 IU into the outer thigh muscle.
2. Clean any wounds found and remove all dead material from the wound(s).
3. Give metronidazole eg 400 mg three times a day for 7 days if the patient can swallow (or 500 mg IV three times a day if available) (high dose benzylpenicillin is an alternative if metronidazole is no available).
4. Give baclofen for muscle spasm. The dose depends on age. For example, a patient aged 12 and over might take 5mg three times a day and increase the dose to 10mg three times a day if needed. Diazepam is an alternative.



Boy with lock jaw and opisthotonos

Other illnesses that can look like tetanus

1. Dental abscess - this can make it hard to open the mouth (see the ENT lesson).
2. Dystonia - a reaction to medicines. For example medicines used to treat nausea and vomiting (eg prochlorperazine and metoclopramide) or medicines to treat severe anxiety and psychosis (eg haloperidol). Stop the medicine if possible (or reduce its dose if the medicine is still needed) and reduce the symptoms with an anticholinergic medicine such as trihexyphenidyl, short term.
3. Opisthotonos and generalised spasms may be very similar to meningitis or cerebral malaria, especially in babies less than a month old. Treat for a very severe febrile illness. Send to hospital to treat for severe tetanus.

Appendix 29 Foreign bodies in ears or in the nose

It can be tricky to remove foreign bodies from ears and nostrils. We mentioned the things to try first in the ENT lesson. We described the nose blow method for older children and adults. The other method that can work well, especially for young children: is a sharp blow in the opposite nostril. You can use a plastic pen sheath (with the ink removed) as a blow pipe. One end of the blow pipe goes just into the opening of the opposite nostril (the one that doesn't have the foreign body in it). You then blow sharply through the other end of the "blow pipe".



Remove the ink from a plastic pen to make a blow pipe

If soapy water has not been successful to remove an object from an ear canal, but the object is visible using an ear torch (an otoscope, also known as an auroscope): You can create a hook to gently place behind the foreign body. For example a 21 gauge (green) needle firmly attached to a syringe. Snip off the very end of the sharp tip of the needle and use pliers, or forceps, to turn the last 3-5mm of the needle through 90 degrees to create a hook. With the "hook" turned to the side, slide the needle past the foreign body, then turn the needle a quarter of a turn to bring the hook behind and pull the object out. You usually get only one chance to do this before the child stops cooperating.



21 gauge needle with tip removed and end bent to 90 degrees

Please do not try to remove objects from the ear unless you can see what you are doing (for example with an otoscope). You are likely to cause more harm than good. If you are in doubt: send them to see someone who has the right equipment.

Appendix 30 - Optional lesson on Leprosy

BEFORE THE LESSON

- This lesson is suitable if you work in India, Brazil or Indonesia or in an area where Leprosy exists.
- Arrange for all the lesson to take place at a leprosy clinic if possible. Try to show each of the students each of the symptoms in Table 1 in section 3.
- Some areas do not have Leprosy clinics. Consider using WhatsApp to allow students to see and talk to patients with Leprosy.
- Give each student a copy of Table 1 'When to refer leprosy patients to hospital' *before the clinic*. They should take Table 1 with them when they visit the clinics.
- There are four posters in this lesson. (See p. 4 for information on how to use the posters.)

Prepared posters 1, 3, 4.

Student answer poster: 2.

SECTION 1:

Quiz

POSTER 1:
(Prepared poster)

Ask the students to answer the questions on their own. Do not give the answers until the end of the lesson.

1. Name three important symptoms of leprosy.
2. What advice would you give to patients with leprosy?

SECTION 2:

Leprosy

POSTER 2:
(Student answer poster)

Divide Poster 4 into four areas. Label the four areas:

Area 1: What is leprosy? Who gets leprosy? Area 2: Leprosy symptoms,

Area 3: Diagnosing leprosy in the clinic, Area 4: Leprosy treatment.

Area 1: What is leprosy? Who gets leprosy?	Area 2: Leprosy symptoms?
mycobacteria	Pale skin with loss of feeling
Area 3: Diagnosing leprosy in the clinic?	Area 4: Leprosy treatment
Examining the patient	treatment takes 6-12 months

POSTER 2:
(Continued)

Ask each student to write one word or idea about leprosy in the correct area on Poster 2. Next, ask students to write other words or ideas on Poster 2. Add any summary words from the information below that the students have missed. Then, for each area in turn, ask each student to tell the class what they understand about the word they wrote. Draw a circle around each word as the student talks about it. Thank each student for their explanation. Use the following explanations to add useful information and to correct mistakes.

Area 1: What is leprosy and who gets leprosy?

Leprosy is caused by *Mycobacterium leprae*. These mycobacteria grow on the **cold parts of the body**, for example on the **face** and **buttocks**, **inside** the **nose** and **in the nerves** under the skin. Like TB mycobacteria, leprosy mycobacteria grow very slowly. This is why you will rarely see young children with leprosy. When a patient with leprosy mycobacteria in the nose coughs or sneezes, the mycobacteria are sprayed into the air and may be **breathed in** by other people. Most people are able to kill all of the leprosy mycobacteria that they breathe in. People who are less able to fight off leprosy mycobacteria will become ill with leprosy after a few years. (People with HIV infection are *not* more likely than other people to become ill with leprosy.) The type of leprosy a person gets depends on how many of the leprosy mycobacteria their body can kill:

- If only a few of the mycobacteria are killed, the patient will develop **lepromatous leprosy**. A leproma is a small lump in the skin that contains mycobacteria leprae. Lepromatous leprosy is now called **Multibacillary leprosy**, meaning that many mycobacteria are found on the split skin smear.
- If some of mycobacteria are killed, the patient will develop **borderline leprosy**. Borderline means something between lepromatous and tuberculoid leprosy. Borderline leprosy is in the multibacillary group and is treated with the same medicines as lepromatous leprosy.
- If most of the mycobacteria are killed, the patient will develop **tuberculoid leprosy**. Tuberculoid means resembling tuberculosis and having few lesions or tubercles in the skin. Tuberculoid leprosy is now called **Paucibacillary leprosy**, meaning that there are few (if any) mycobacteria found on a split skin smear.

Another name for leprosy is Hansen's disease.

Who gets leprosy?

- Anyone in close contact with a person with leprosy may get it themselves.
- It is more common in males.
- It is rare to see it before 20 years of age. The average incubation period is 5 years.

Area 2: What symptoms does leprosy cause?

Leprosy causes symptoms in the places where the leprosy mycobacteria grow:

- If leprosy grows in the skin, it makes the **skin go pale** (in dark-skinned people) **or red** (in light-skinned people).

Leprosy can also cause loss of feeling in the skin.

- If leprosy grows in a nerve, it will damage the nerve. This can **stop** the **muscles** from **working** and the patient may not be able to move part of his body. It can also **stop** the patient from **feeling** things. If he cannot feel hot or sharp things he may damage himself.
- Patients who have multibacillary leprosy (lepromatous leprosy and borderline leprosy) may have corneal ulceration and **poor eyesight**.

Send a patient with any of these symptoms to the leprosy clinic:

1. An area of the **skin** has become **pale** or red. Ask the patient to close his eyes. Touch the pale area with the corner of a piece of cloth. If the patient is **not able to feel** the cloth, send him to the leprosy clinic.
2. A pale area of skin is **no better after** using a **treatment for fungus infection for 4 weeks**.
3. An **unusual feeling** in an arm, leg or on the face.
4. **Painless ulcers or burns** on his feet or hands.
5. **Swelling in the skin**, often in the ears, which is not painful. The swollen skin does not sweat and loses hair. It is common for people with leprosy to lose the outer part of the eyebrows.
6. A **nerve is painful when you touch it**. Common places to find painful nerves are in the neck, above the elbows, at the wrists, the side of the knees and at the ankles. The nerves feel like dead worms when you touch them.

If a patient cannot feel a corner of cloth (or cotton wool) touching their feet, they may have leprosy. Patients with anaemia, malnutrition or tiredness may also tell you that they cannot feel their feet but they can feel cloth touching their feet.

Area 3: How leprosy is diagnosed in the clinic

Leprosy is usually diagnosed by just **examining the patient**. The clinician will look for the symptoms and signs of leprosy described in area 2 and will check that the nerves to move the face, hands and feet work and that the patient can feel the skin of any rash areas and the hands and feet.

Sometimes **skin-slit smear** microscopy is needed. The doctor makes small cuts in several parts of the patient's skin and takes scrapes of the patient's skin to look at under a microscope.

Microscopy of smears of this skin may find acid fast bacilli (AFB). Leprosy mycobacteria are acid fast bacilli.

Area 4: Leprosy treatment

Leprosy mycobacteria multiply very slowly, so it takes several months to kill all of them. Medicines used to treat leprosy are **dapsone, rifampicin** and **clofazimine**.

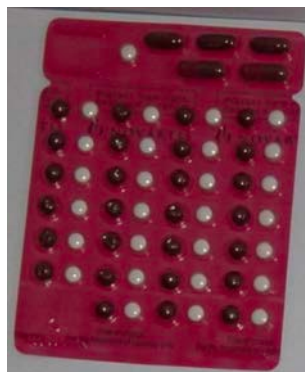
- **Paucibacillary (PB) leprosy (Tuberculoid leprosy)** - Patients are **treated for 6 months**, with dapsone 100 mg every day. They also take rifampicin 600 mg once a month, usually in the clinic. Patients continue to be seen in the leprosy clinic for 2 years.

- **Multibacillary (MB) leprosy (Borderline and lepromatous leprosy)** - Patients with borderline or lepromatous leprosy are **treated for 12 months**. They take dapsone 100 mg and clofazimine 50 mg every day. Patients also take rifampicin 600 mg and clofazimine 300 mg once each month, usually in the clinic. Patients go to the leprosy clinic for 5 years.

MDT for PB leprosy		
Monthly dose	Rifampicin	600 mg
	Dapsone	100 mg
Daily dose	Dapsone	100 mg



MDT for MB leprosy		
Monthly dose	Rifampicin	600 mg
	Clofazimine	300 mg
	Dapsone	100 mg
Daily dose	Dapsone	100 mg
	Clofazimine	50 mg



Side effects of leprosy medicines

Dapsone sometimes makes the patient very ill (with a high fever, rash, lymph node enlargement and jaundice) 4-6 weeks after starting treatment. Dapsone hypersensitivity happens to perhaps 1 in 100 patients on dapsone. Stop the medicine and send the patient to hospital immediately.

Patients usually have damaged nerves by the time treatment for leprosy is started. Treatment can make the nerve problems worse temporarily, causing lack of feeling or weakness in a part of the body. Patients with borderline Leprosy are particularly prone to having reactions when they start leprosy treatment. These are type 1 reactions (also known as reversal reactions) in which the affected skin may become red, hot, tender and swollen. Affected nerves will often be painful in type 1 reactions. Type 1 reactions are treated with steroids for 2-4 months and the steroids must be slowly reduced rather than suddenly stopped.

Type 2 reactions can affect patients who have lepromatous leprosy. They can get painful nodules on their thighs, shins, arms and even the face, usually with a high fever. This is also called an ENL reaction. Sometimes an ENL reaction will cause blistering, tissue death and necrosis at these tender lumps. Type

2 (ENL) reactions usually respond well to thalidomide if it is available. Thalidomide must not be used if there is any chance that a woman could become pregnant. Steroids are an alternative. Send any patients back to the leprosy clinic urgently if they develop new weakness, new areas with loss of feeling or evidence that the rash is getting worse as described above. With early treatment further damage to the nerves can be prevented.

Advice for patients with leprosy

POSTER 3:
(Prepared poster)

- They **cannot infect** other people **3 days after** starting the **treatment**.
- **If they do not complete** the **treatments** they **will become ill again**. Leprosy mycobacteria are **more difficult to treat after incomplete treatment**.
- They can **exercise** if they feel well enough.
- Leprosy medicines are safe during pregnancy but thalidomide must not be used. Women are advised **not to get pregnant** while taking leprosy medicines. This is because they are more likely to get rebound nerve damage after they have delivered their baby.
- Rifampicin and clofazimine make sweat, tears, **urine and semen red or orange** in colour. The semen is healthy and **men may safely father children** when taking leprosy medicines. Leprosy is not passed on to the baby in this way.
- Patients can have **sexual intercourse**. Leprosy is not passed on during sexual intercourse.
- If you become very ill 4-6 weeks after starting dapsone treatment, stop the medicine and go to hospital immediately.

For patients taking clofazimine:

- Clofazimine may cause the **skin** to become **orange** or purple and the skin of the arms and legs to become dry.
- Clofazimine may also cause **abdominal pains** or **diarrhoea**. Do not stop the medicine.

Patients with tuberculoid leprosy: Paucibacillary

- Treatment takes 6 months.

Patients with borderline leprosy: Multibacillary

- Treatment takes 12 months.
- Part of the body may become very **painful** and **swollen** or **weak**. This is called a **reversal reaction** (this is also known as a type 1 reaction). Do not stop the medicine. **Take paracetamol**, two tablets four times a day. Go to the leprosy clinic.

Patients with lepromatous leprosy: Multibacillary

- Treatment takes 12 months.
- The patient may have a **fever** (and a malaria test is negative) with painful lumps on the legs and arms. This is called an ENL reaction. Do not stop the leprosy medicine. Take **paracetamol**, two tablets four times a day, and go to the leprosy clinic.

Nerve damage means that many leprosy patients cannot feel parts of their feet or hands. Advise patients to give their feet and hands special treatment every day to prevent the skin becoming broken and ulcerated.

POSTER 4: Skin treatment advice

(Prepared poster)

- **Look at your feet, hands and eyes every day.** Use a mirror or ask a friend to look at your eyes.
- **Soak your feet in water mixed with vegetable oil.** Coconut oil is suitable.
- **Remove hard skin** by rubbing gently with a rough stone.
- Put **vegetable oil or petroleum jelly** on your hands and feet.
- **Clean and cover wounds.**
- Every day **stretch** the joints and muscles that you cannot use.
- Protect your hands with **gloves** or a cloth when you cook or work.
- Protect your feet with **shoes**. These must be the correct size, have a soft rubber sole, and be soft inside.
- If your eyelids are weak: Wear **sunglasses** during the day. **Cover your eyes with a cloth at night.** Your doctor may give you eye drops to stop your eyes from becoming dry.

SECTION 3: When to refer patients to hospital

Before the lesson, give each student a copy of List 1, which explains when to send patients to a clinic or hospital. They should take this box with them when they visit the TB and leprosy clinics.

List 1 When to refer TB and leprosy patients to hospital

LEPROSY PATIENTS

Refer to the leprosy clinic for diagnosis if:

- pale or red skin areas and no feeling in the skin
- strange feeling in an arm, leg or face
- ulcers or burns, which are not painful
- painful nerves

Send to hospital immediately if:

- using dapsone and has fever and rash. Stop the dapsone.

Continue leprosy medicines, give paracetamol and send to the leprosy clinic if:

- borderline leprosy with painful skin or a new weak foot or a new weak hand
- lepromatous leprosy with fever with painful lumps, if there is no obvious cause (test for malaria in malaria areas). This may be a type 2 (or ENL) reaction.

SECTION 4: Practical: Visits to a leprosy clinic

Each student should visit a leprosy clinic during the course.

SECTION 5: Answers to the quiz

Ask the students to call out the answers to each question in the quiz.

1. Name three important symptoms of leprosy.

- Pale skin with loss of feeling
- Ulcers or burns on the hands or feet which are not painful
- Swelling in the skin which is not painful
- Pain on touching a nerve
- Weakness of muscles in the face, hand and leg.

2. What advice would you give to patients with leprosy

- They cannot infect other people 3 days after starting the treatment.
- If they do not complete the treatments they will become ill again. Leprosy mycobacteria are more difficult to treat after incomplete treatment.
- They can exercise if they feel well enough.
- Women are advised not to get pregnant while taking leprosy medicines.
- Rifampicin and clofazimine make sweat, tears, urine and semen red or orange in colour. The semen is healthy and men may safely father children when taking leprosy medicines. Leprosy is not passed on to children.
- Patients can have sexual intercourse. Leprosy is not passed on during sexual intercourse.

SECTION 6 : A list of medications used to treat leprosy

Medicine	Uses	Important or common unwanted symptoms
Clofazimine	Multibacillary Leprosy	Causes skin to become orange. Occasionally it can trigger low mood or depression.
Dapsone tab 25 mg, 50 mg, 100 mg	Leprosy (together with rifampicin and sometimes clofazimine)	Mild headaches or nausea. Blue lips and fingertips (usually this is harmless). A G6PD blood test should be done before using dapsone to avoid it causing anaemia. Dapsone sometimes makes the patient very ill (with a high fever, rash, lymph node enlargement and jaundice) 4-6 weeks after starting treatment. This happens to perhaps 1 in 100 patients on dapsone. Stop the medicine and send the patient to hospital immediately. Rarely dapsone can harm the bone marrow causing fever, mouth ulcers, sore throat, bruising or prolonged bleeding.
Rifampicin	TB and Leprosy	Common: Diarrhoea, nausea Rare: Rash, bleeding gums or bruising

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Appendix 31 List of medicines and their uses

Abbreviations:

x1/day = od = one time a day

x2/day = bd = two times a day

x3/day = tds = three times a day

x4/day = qds = four times a day

x1 = stat = one time only

1/2 = one half

1/4 = one quarter

+ = and above

tab = tablet

cap = capsule

The contraindications, adverse effects and precautions are nicely summarised on the MSF Essential drugs publication. You can access MSF Essential drugs here:

<https://medicalguidelines.msf.org/en/viewport/EssDr/english/essential-drugs-16682376.html>

Medicine	Uses	Dose
Acetaminophen = Paracetamol See Paracetamol		
Acetic acid ear drops	An option for mild otitis externa	2 or 3 drops x2/day for 5 days
Acetylsalicylic acid = Aspirin = ASA oral. tab 300 mg Do not use in children aged 3 or under. Reye's syndrome is a serious condition which can kill children caused by aspirin use. Do not use if Dengue is possible.	Treatment of heart attack and stroke and peripheral vascular disease. Pain and fever	When you suspect a heart attack or a stroke take 300 mg x1 then 1/4 tablet (75mg) after breakfast once a day long term. Adolescent over 16 years and adult: 300 mg to 1 g every 4 to 6 hours (max. 4 g daily), for 1 to 3 days.
Aciclovir tab 200 mg; 400 mg; 800 mg	Herpes simplex (genital or herpetic corneal ulcer) Herpes zoster	400 mg 3 times daily for 7 days 0-2 years: 200 mg 5 times daily for 5-7 days 3-5 years: 400 mg 5 times daily for 5-7 days Patients aged 6 +: 800 mg 5 times daily for 5-7 days
Albendazole tab 400 mg	Hookworm, Ascaris, or pinworm Whipworm Strongyloides	Less than 10 kg: 200 mg x1 Above 10 kg: 400 mg x1 For whipworm treat for 3 days Less than 10 kg: 200 mg x1/day 3 days Above 10 kg: 400 mg x1/day 3 days

Medicine	Uses	Dose										
Aspirin: see Acetylsalicylic acid												
Amitriptyline tab 10 mg; 25 mg	Neuropathic pain	5-25mg at night										
Amlodipine 5 mg or 10 mg tab (10 mg often causes ankle swelling)	To lower high blood pressure and to prevent heart attacks and strokes	5 mg at night (Sometimes 10 mg at night) Long term treatment (possibly for life)										
Aminophylline tab 100 mg	For patients with wheeze without signs of respiratory distress and no fast breathing	<table border="0"> <thead> <tr> <th>Age</th> <th>Dose</th> </tr> </thead> <tbody> <tr> <td>0-11 months.</td> <td>1/4 tab x3/day</td> </tr> <tr> <td>1-5 years</td> <td>1/2 tab x3/day</td> </tr> <tr> <td>6+ years</td> <td>1 tab x3/day</td> </tr> </tbody> </table> Give 5 days treatment	Age	Dose	0-11 months.	1/4 tab x3/day	1-5 years	1/2 tab x3/day	6+ years	1 tab x3/day		
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6+ years	1 tab x3/day											
Amoxicillin tab 250 mg tab 500 mg liquid 125 mg in 5 ml In the penicillin family	For pregnant women with sinusitis. For pregnant woman with a UTI or kidney infection. Otitis media, pneumonia or initial treatment of a tooth abscess	250 mg x3/day 500 mg x3/day <table border="0"> <thead> <tr> <th>Age</th> <th>Dose</th> </tr> </thead> <tbody> <tr> <td>0-2 months.</td> <td>62.5 mg x3/day</td> </tr> <tr> <td>2-11 months</td> <td>125 mg x3/day</td> </tr> <tr> <td>1-10 years</td> <td>250 mg x3/day</td> </tr> <tr> <td>11+ years</td> <td>500 mg x3/day</td> </tr> </tbody> </table> Give 5 days treatment	Age	Dose	0-2 months.	62.5 mg x3/day	2-11 months	125 mg x3/day	1-10 years	250 mg x3/day	11+ years	500 mg x3/day
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Artemether with Lumefantrine = Coartem tab 140 mg	Malaria	<table border="0"> <thead> <tr> <th>Age</th> <th>Dose</th> </tr> </thead> <tbody> <tr> <td>0-5 years</td> <td>1 tab x2/day for 3 days</td> </tr> <tr> <td>6-8 years</td> <td>2 tab x2/day for 3 days</td> </tr> <tr> <td>9-12 years</td> <td>3 tab x2/day for 3 days</td> </tr> <tr> <td>Over 12.</td> <td>4 tab x2/day for 3 days</td> </tr> </tbody> </table>	Age	Dose	0-5 years	1 tab x2/day for 3 days	6-8 years	2 tab x2/day for 3 days	9-12 years	3 tab x2/day for 3 days	Over 12.	4 tab x2/day for 3 days
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Over 12.	4 tab x2/day for 3 days											
Artesunate Powder for injection, in 60 mg-vial Dissolve the powder in the entire volume of 5% sodium bicarbonate and shake the vial until the solution becomes clear . Do not use if the solution is cloudy. Then, add the 0.9% sodium chloride into the vial: - 5 ml of 0.9% sodium chloride to obtain 6 ml of artesunate solution containing 10 mg/ml, for IV injection - 2 ml of 0.9% sodium chloride to obtain 3 ml of artesunate solution containing 20 mg/ml, for IM injection	Malaria test positive and very severe febrile disease. Treat with intramuscular (or intravenous if you have been trained) artesunate. Give one injection and send to hospital. The injections can be repeated at 12 hours and 24 hours (3 doses). The patient should then take a normal full course of Coartem. But if the patient is unable to take tablets the injections can be then given daily for a maximum of 7 days.	Each dose: Intramuscular or intravenous: Child less than 20 kg 3 mg/kg Adult 2.4 mg/kg It is useful to refer to a table to get the dose of artesunate correct. Please see after the list of medicines for: the Artesunate injectable doses table .										
Atorvastatin	To prevent heart attacks and strokes	The most common dose is: 20 mg x1/day. Many people are treated with 80 mg x1/day										

Medicine	Uses	Dose
Azithromycin tab 250 mg or 500 mg	Scrub typhus for pregnant women Chlamydia conjunctivitis (also use tetracycline eye ointment) Syphilis or chlamydia Dysentery (bloody diarrhoea) See MSF essential drugs for other infections and doses eg cholera and whooping cough	500 mg one time 20 mg/kg, 1 g maximum once. 2 g one time 10 mg/kg for 3 days
Beclometasone metered dose inhaler 50 µg, 100 µg, 150 µg, 200 µg or 250 µg via spacer (spacers can be made from clean plastic bottles)	Preventative inhaled medication for asthma - should always be taken through a spacer	Child 50 or 100 µg x2/day increase to 200 µg x2/day if needed Adult 100 or 250 µg x2/day increase to 500 µg x2/day if needed
Benzoic acid and acetylsalicylic acid (Whitfield ointment) Ointment	For a fungus infection of the skin	Rub onto the affected area only x1/day for many weeks. Use for at least 4 weeks. If no better after 4 weeks send the patient to the leprosy clinic. If the affected area is smaller after 4 weeks continue to use Whitfield ointment until the rash has gone completely, and for 1 more week.
Benzyl Benzoate 25% lotion Dilute the lotion, as required, according to age. Use drinking or boiled water.	Scabies. Close contacts should be treated at the same time regardless of whether they have symptoms or not.	Apply the lotion to the whole body, including scalp, the area behind the ears, palms of the hands and soles of the feet, paying particular attention to skin creases and interdigital web spaces. Leave on for 24 hours, then rinse thoroughly with water. The skin can be itchy for almost 4 weeks after successful treatment.
Bisacodyl tab 5 mg	Constipation	Age Dose Child over 3 1 or 2 tabs /day Adult 1-3 tabs /day Treat for up to 7 days. Increase fluid, activity and fruit and vegetables.
Ceftriaxone Injection 250 mg or 1 g in vial	Very severe febrile disease Suspected sepsis	50 mg/kg up to 2 g intramuscularly, repeat daily

Medicine	Uses	Dose
Chloramphenicol intravenous Injection 1 g in a vial Add 10 ml sterile water. Shake until clear.	For severe infections that cause a general danger sign. For epiglottitis, mastoiditis or cellulitis near the ear. Give intravenously.	40 mg for each kg x1 intravenously Do not give more than 1000 mg. Repeat each 6 hours if the patient is not able to get to the hospital. Do not give for longer than 5 days.
Cholecalciferol = Vitamin D3 Normally available from sunlight on the skin	Vitamin D deficiency Rickets and osteomalacia (Preventive dose if no access to sunlight eg in winter: 400 IU if under 1 year, 600 IU if over 1 year)	All ages: 2000 IU daily for 3 months Or 50,000 IU as a single dose if aged 3 months - 1 year. Or 150,000 IU as a single dose if aged above 1 year. Then a preventive dose.
Ciprofloxacin tab 250 mg or 500 mg See MSF essential drugs for other infections and doses eg cholera	Typhoid fever, pyelonephritis (kidney infection) mastoiditis and cellulitis of the ear. A penetrating injury of the eye. As part of treatment for syphilis Chancroid or dysentery Gonorrhoea	500 mg x2/day for 5-7 days 750 mg x2/day until seen by eye doctor 500 mg x2/day for 3 days 500 mg x2/day for 3 days 500 mg single dose
Ciprofloxacin 0.3% ear drops	Otitis externa Chronic suppurative otitis media	Over 1 year: 2 drops x2/day 7 days 2 drops x2/day 14 days or until pus stops
Clarithromycin tab 500 mg	Chest or sinus infections and otitis media when the patient is allergic to penicillin or the infection is atypical.	12+ year old: 500 mg x2/day for 5 days Child over 30 kg: 250 mg x2/day Child less than 30 kg: 125 mg x2/day Child under 1 year: 62.5 mg x2/day
Clindamycin Cap 150 mg or 300 mg	Serious infections when penicillin not suitable (eg allergy): cellulitis, osteomyelitis. Together with quinine for malaria in the first 3 months of pregnancy	Age Dose 1-5 years 150 mg x3/day 6-9 years 300 mg x3/day 10-12 years 450 mg x3/day 13+ years 600 mg x3/day For 7 to 10 days 10 mg/kg x2/day for 7 days
Clofazimine	Multibacillary Leprosy	Causes skin to become orange. Occasionally it can trigger low mood or depression.

Medicine	Uses	Dose										
Clotrimazole Vaginal tab	Vaginal thrush (candida)	500 mg x1 inside vagina at bedtime										
Cloxacillin cap 250 mg or 500 mg In the penicillin family	Impetigo that affects a large area of the skin. Erysipelas. Other staphylococcal infections. Osteomyelitis.	<table> <thead> <tr> <th>Age</th> <th>Dose</th> </tr> </thead> <tbody> <tr> <td>1 month to 1 year</td> <td>125 mg x4/day</td> </tr> <tr> <td>2-9 years</td> <td>250 mg x4/day</td> </tr> <tr> <td>10 years +</td> <td>250-500 mg x4 day</td> </tr> </tbody> </table>	Age	Dose	1 month to 1 year	125 mg x4/day	2-9 years	250 mg x4/day	10 years +	250-500 mg x4 day		
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Colchicine tab 500 µg	Gout	500 µg twice a day for 6 days										
Combined oral contraceptive. Many types. Take care that some older types of combined contraceptives have 7 inactive tablets in each 28 pill pack. Newer packs do not have inactive tablets. It is more effective to prevent pregnancy if the pill free interval is only 4 days. Many women prefer to take 2 or 3 packs of pill without a break.	To delay pregnancy. To treat heavy periods, or painful periods, if does not want to become pregnant at present. Condom use is also encouraged to reduce the risk of HIV infection. Condom use for the first 7 days improves the contraceptive protection.	Most pills: one active pill every day for at least 21 days and often 63 days. Then a pill free interval for 4 days (during which you may have a withdrawal bleed). Then restart. All pills may be used for several years.										
Co-trimoxazole tab 480mg or liquid 240mg in each 5ml (5ml =1/2 tab) Note: 480mg of co-trimoxazole consists of sulphamethoxazole 400mg and trimethoprim 80mg	<p>To prevent Pneumocystis Jirovecii Pneumonia</p> <p>For pneumonia, bronchitis, cellulitis, large areas of impetigo, acute dacrocystitis, dysentery, otitis media, infected otitis external or sinusitis. Also for UTI after the urine has been checked for nitrites or under a microscope.</p> <p>For osteomyelitis or a sickle-cell crisis (and septic arthritis if will not be at hospital within 6 hours)</p>	<p>Less than 16 kg: 60 mg/kg x1/day long term Adult 960 mg x1/day long term</p> <table> <thead> <tr> <th>Age</th> <th>Dose</th> </tr> </thead> <tbody> <tr> <td>0-6 months</td> <td>2.5ml (1/2 teaspoon) x2/day or 1/4 tab x2/day</td> </tr> <tr> <td>7 months- 5 years</td> <td>1/2 tab</td> </tr> <tr> <td>6-12 years.</td> <td>1 tab x2/day</td> </tr> <tr> <td>13+ years.</td> <td>2 tabs x2/day</td> </tr> </tbody> </table> <p>Give 5 days treatment</p> <p>Give two times the normal dose x1 and send to hospital</p>	Age	Dose	0-6 months	2.5ml (1/2 teaspoon) x2/day or 1/4 tab x2/day	7 months- 5 years	1/2 tab	6-12 years.	1 tab x2/day	13+ years.	2 tabs x2/day
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Cyclizine tab 50 mg injection 50 mg/ ampoule	For vomiting and severe nausea	50 mg three times a day										
Dapsone tab 25 mg, 50 mg, 100 mg	Leprosy (together with rifampicin and sometimes clofazimine)	<table> <thead> <tr> <th>Age</th> <th>Dose</th> </tr> </thead> <tbody> <tr> <td>Under 10 years</td> <td>2 mg/kg</td> </tr> <tr> <td>10-14 years.</td> <td>50 mg x1/day</td> </tr> <tr> <td>15+ years</td> <td>100 mg x1/day</td> </tr> </tbody> </table>	Age	Dose	Under 10 years	2 mg/kg	10-14 years.	50 mg x1/day	15+ years	100 mg x1/day		
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15+ years	100 mg x1/day											

Medicine	Uses	Dose																
Diazepam. Rectal solution. 5mg or 10mg in a rectal tube.	When the patient is having a convulsion. Give rectally. For large broken bones	<table border="0"> <tr> <td><i>Age</i></td> <td><i>Dose</i></td> </tr> <tr> <td>Less than 1 year</td> <td>2.5 mg</td> </tr> <tr> <td>1-3 years</td> <td>5 mg</td> </tr> <tr> <td>4 years or more</td> <td>10 mg</td> </tr> </table> Give one more dose if still convulsing 5 minutes after the first dose.	<i>Age</i>	<i>Dose</i>	Less than 1 year	2.5 mg	1-3 years	5 mg	4 years or more	10 mg								
<i>Age</i>	<i>Dose</i>																	
Less than 1 year	2.5 mg																	
1-3 years	5 mg																	
4 years or more	10 mg																	
Diclofenac	Renal colic pain	75 mg intramuscularly																
Desorgestrel (Progesterone only pill) tab 75 µg See MSF essential drug list for contraindications.	Contraception. Reduces chance of pregnancy. But if misses pill should use condoms for 2 days. Long term condom use is recommended to reduce the risk of HIV and other sexually transmitted infections	One tablet every day continuously long term.																
Doxycycline cap 100 mg (sometimes 40 mg or 50 mg) Should not be used during the 2nd and 3rd trimesters of pregnancy or during breast feeding (discolours the babies teeth)	Louse-borne relapsing fever, epidemic typhus, cholera. Some other infections including chest and sinus infections Doses for other conditions are different (eg syphilis; brucellosis; plague; cutaneous anthrax; filariasis (before ivermectin)) Scrub typhus	Child 4 mg/kg single dose (max. 100 mg) Adult 200 mg single dose (300 mg for cholera) Usual dose is 200 mg after food on day 1 and then 100 mg daily for 6 more days. Different doses and length of treatment for each condition (100 mg twice a day for 7 days for adults with leptospirosis) 200 mg x1/day for 3-7 days																
Enalapril tab 5 mg, 10mg or 20 mg	High blood pressure Heart failure (chronic)	For high blood pressure: usually 5 mg x1/day long term																
Epinephrine (adrenaline). Injection 1 in 1000. 1 ml vial.	For anaphylaxis: Inject intramuscularly. For severe acute asthma attack: inject subcutaneously (under the skin)	<table border="0"> <tr> <td><i>Age</i></td> <td><i>Dose</i></td> </tr> <tr> <td>Less than 1 year</td> <td>0.1 ml</td> </tr> <tr> <td>1-4 years</td> <td>0.25 ml (1/4 vial)</td> </tr> <tr> <td>5 years or more</td> <td>0.5 ml (1/2 vial)</td> </tr> </table> Repeat if still unconscious or unwell 10 minutes after first injection. <table border="0"> <tr> <td><i>Age</i></td> <td><i>Dose</i></td> </tr> <tr> <td>Up to 12 months</td> <td>0.1 ml</td> </tr> <tr> <td>1-5 years.</td> <td>0.25 ml (1/4 vial)</td> </tr> <tr> <td>6 + years</td> <td>0.5 ml (1/2 vial)</td> </tr> </table>	<i>Age</i>	<i>Dose</i>	Less than 1 year	0.1 ml	1-4 years	0.25 ml (1/4 vial)	5 years or more	0.5 ml (1/2 vial)	<i>Age</i>	<i>Dose</i>	Up to 12 months	0.1 ml	1-5 years.	0.25 ml (1/4 vial)	6 + years	0.5 ml (1/2 vial)
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1-5 years.	0.25 ml (1/4 vial)																	
6 + years	0.5 ml (1/2 vial)																	
Ergometrine Injection 0.5 mg for each 1 ml (1 ml in vial) Store in a cool place, preferably a fridge.	Prevents or treats postpartum haemorrhage. For women who have just given birth. After all babies have been born.	0.5 ml x1 into muscle to prevent postpartum haemorrhage. 0.5 ml x1 into vein to treat postpartum haemorrhage.																

Medicine	Uses	Dose
Erythromycin tab 250 mg	For chlamydia conjunctivitis For other bacterial infections when penicillin not suitable (allergy or atypical infection) eg. chest, sinus and ear infections. Impetigo, folliculitis, diphtheria.	10mg for each kg x3/day for 21 days (together with tetracycline eye ointment) Age Dose Under 5 years. 250 mg x4/day 5 years +. 500 mg x4/day Give 5 days of treatment. Diphtheria requires 10 days of treatment and antitoxin injections.
Etonogestrel subdermal contraceptive implant One rod	Prevention of pregnancy	With a minor procedure, 1 small rod are inserted under skin of the arm. The implants need to be replaced each 3 years.
Fansidar: see pyrimethamine + sulfadoxine		
Ferrous sulphate tab 200 mg (60 mg of iron) (also ferrous fumarate 210 mg) or ferrous sulphate 200 mg with folic acid 0.25 mg Iron salts cause the stool to be grey or black and commonly cause constipation (reduce the dose)	For anaemia after its causes have been treated (treat for malaria and hookworm and advise about a mixed diet first). All pregnant women.	Weight Dose 0-15 kg 1/4 tab x2/day 16-29 kg. 1/2 tab x2/day 30-44 kg 1 tab x2/day 45+ kg 1 tab x3/day Lower the dose to once a day if side-effects or lack of tablets. Treat for three months. One tab every day for the whole pregnancy.
Folic acid = Vitamin B9 tab 0.4 mg tab 1 mg or tab 5 mg	To prevent baby spinal defects in pregnancy. For sickle cell disease: treats and prevents anaemia.	0.4 mg every day for the first 3 months of pregnancy and when preparing for pregnancy (5 mg every day if on co-trimoxazole or dolutegravir). Not to be used on the same day as Fansidar or toxoplasmosis treatment (<u>pyrimethamine</u> and <u>sulfadiazine</u>) 5 mg times every day long-term.
Folinic acid (a form of vitamin B9) tab 15 mg, 5 mg, 25 mg	Used to decrease the toxic effects of pyrimethamine.	Adult 30 mg x1/week whilst on preventative dose of pyrimethamine. 15 mg x1/day whilst on treatment for toxoplasmosis
Fluconazole cap 50 mg, 100 mg, 200 mg 150 mg liquid 50 mg/ 5 ml	Oral and pharyngeal candida: Oesophageal candida: Prevention of Cryptococcal meningitis	Usually 50 mg daily for candida treatment For 7-14 days For 14-28 days 200 mg daily for adults (6 mg/kg x1/day for children max. 200 mg) long term

Medicine	Uses	Dose
Fluoxetine cap 20 mg	Major depression Generalised anxiety disorder Severe post-traumatic stress disorder	20 mg x/1 day (usually in the morning) for most problems
Gentian violet crystals 5 g (one heaped teaspoon) to be dissolved in 1 litre of water. Strain mixture or carefully pour into a new bottle to remove any sediment. Do not use a higher concentrations - these can harm skin.	For impetigo if less than 10 cm wide. Do not use if you have a safer alternative. For fungal skin infections but only if other treatments are not available	Paint x1/day for five days.
Griseofulvin tab 125 mg, 500 mg	Fungal skin infection especially of the scalp (scalp ringworm)	Age. Dose Child 1-11 years 10-20 mg/day x1 Aged 12+ 500 mg/day x1 Treat for 6 weeks minimum for scalp. Sometimes 4 weeks is enough elsewhere.
Hydrochlorthiazide tab 12.5 mg or 25 mg	For high blood pressure	12.5 mg x1/day long term A potassium-rich diet (bananas, mangos, oranges, tomatoes, etc.) is recommended during treatment.
Ibuprofen tab 200 mg or tab 400 mg Do not use if Dengue is possible.	For painful periods and heavy periods. For kidney stones Must not be used when chickenpox is present - ibuprofen may make infections worse	400 mg 3x/day only when the period starts and for 3-5 days. 600 mg x3/day when there is pain. Stop ibuprofen if has pain in the upper abdomen or black tarry stool. It can cause bleeding from the stomach or duodenum.
Intrauterine device (IUD) or Intrauterine system (IUS)	Emergency contraception Contraception The Intrauterine system is used to manage heavy or painful periods.	For emergency contraception a copper intrauterine device (IUD) can be fitted up to after unprotected sexual intercourse. This is more effective than Ulipristal. Less than 1% of women get pregnant who use an intrauterine device like this.
Ivermectin tab 3 mg (Liquid for injection can also be taken by mouth)	Scabies Strongyloides Larva migrans	200 µg/kg as a single dose (not in pregnancy) Consider repeating the dose after 2 weeks

Medicine	Uses	Dose
Levonorgestrel emergency contraception tab 1.5 mg	Emergency contraception Eg after condom breaking, missed pill or rape. Only reduces the chance of unwanted pregnancy. An intrauterine device is more effective. Levonorgestrel will not terminate an existing pregnancy.	One 1.5 mg tablet, whatever the day of the cycle, as soon as possible after unprotected intercourse. Preferably within 3 days. Up to 5 days after unprotected intercourse.
Levonorgestrel subdermal contraceptive implant 2 small rods	Prevention of pregnancy	With a minor procedure, 2 small rods are inserted under skin of the arm. The implants need to be replaced each 4-5 years. (Obese women need it replacing each 4 years.)
Levonorgestrel 30 µg = progestogen only pill Failure rates of this type of pill are quite high, especially since it is important that the pill be taken at the same time of day.	To delay pregnancy. To treat heavy periods, or painful periods, if does not want to become pregnant at present. Condom use is also encouraged to reduce the risk of HIV infection. Condom use for the first 7 days improves the contraceptive protection.	One pill taken every single day. May be used for several years. One tablet daily to be taken at the same time each day, on a continuous basis, including during menstruation. Contraception may be started at any moment of the cycle if it is reasonably certain the woman is not pregnant, including when switching from another form of contraception. Contraception will be effective as of the 3rd tablet. If a pill is missed, it should be taken as soon as possible and usual treatment continued. The missed pill and next scheduled pill can be taken together. If the missed pill is more than 3 hours overdue, the effectiveness of the contraceptive is reduced. Offer emergency contraception if the woman has had intercourse in the 5 days preceding the missed pill.
Lidocaine hydrochloride (Lignocaine) Injection 1% or 2%	Inject into the muscle around a new wound before cleaning and stitching it. Make sure that the needle is not in a vein by pulling back the plunger on the syringe before injecting.	Not more than 20 ml of 1% Not more than 10 ml of 2%

Medicine	Uses	Dose
Magnesium sulphate Injection	For eclampsia. If a pregnant woman has a convulsion.	5 g intramuscularly in to each leg. After 4 hours give 2.5 g into each leg.
Mebendazole tab 100 mg	Removes hookworm round worm whipworm and threadworm. Not for women in the first 3 months of pregnancy	Age Dose 1+ year 100 mg x2/day Give treatment for 3 days.
Metformin tab 500 mg	For type 2 diabetes to lower chance of heart attack and stroke	1/2 to 1 tab taken with main meals Start with low dose and increase dose very slowly to 1 tab x2/day
Medroxyprogesterone acetate contraceptive injection 150 mg in 1 ml vial	Long acting progesterone only contraceptive	One injection (150 mg) each 13 weeks. (OK to inject 2 weeks early or up to 4 weeks late.)
Mefenamic acid tab 500 mg	For painful periods (dysmenorrhoea) (also for heavy periods)	mefenamic acid 500 mg three times a day for 4 days from the earliest sign of a period starting
Metronidazole tab 200 mg or 250 mg	Giardia Amoebiasis (prolonged dysentery) (After this treatment: consider treating to kill the parasite in the intestine and to stop cyst production: eg diloxanide or paromomycin or iodoquinol) For initial treatment of a tooth abscess. Send the patient to the dentist. Smelly vaginal discharge or if urethral discharge no better after treatment for gonorrhoea and chlamydia Treatment for acute tetanus (intravenous is better) Or as part of treatment for pelvic inflammatory disease Together with ceftriaxone for orbital cellulitis	400 or 500 mg x3/day for 5 days. Child 15 mg/kg x3/day Adult 500 mg x3/day Treat for 5 days if only affects the intestine (bloody diarrhoea for more than a week). (10 days if liver is affected). This does not stop the production of cysts. 200 mg or 250 mg x3/day for 5 days. 2 g x1, or 400 mg x3/day for 5 days 400-500 mg x2/day for 7 days 400 mg x3/day for 5 days. It is dangerous to drink alcohol when using metronidazole.

Medicine	Uses	Dose
Miconazole cream	Fungal skin infection	Rub onto the affected area only x1/day for many weeks. Use for at least 4 weeks. If no better after 4 weeks send the patient to the leprosy clinic. If the affected area is smaller after 4 weeks continue to use Whitfield ointment until the rash has gone completely, and for 1 more week.
Miconazole oral gel	Mild oral thrush	2.5 ml kept in mouth for 3 minutes then swallowed x4/day for 7 days
Moduretic tab 55 mg	High blood pressure	1/4 tablet at night long term
Multivitamins tab	These are not useful to treat or prevent malnutrition. Teach patients how to grow and eat a mixed diet. If a patient does not need any medicine but they insist that you give them a medicine, give them multivitamins. Multivitamins will not harm the patient.	1 tab x1/day for 5 days as a placebo treatment
Mupirocin 2% ointment	Small area of impetigo (less than 5 cm)	Apply to affected area x3/day for 7 days. Review after 3 days. If no better switch to oral antibiotics.
Nicotinamide = Niacin = Vitamin B3 tab 100 mg	Pellagra (rash on face and sun exposed areas). Common in is common when the diet is almost entirely based on sorghum, millet or maize. Also common on alcoholics.	100 mg x/1 day until rash better. Also needs diet rich in protein.
Nitrofurantoin tab 100 mg	For simple urinary tract infections	For women 100 mg x2/day for 5 days. Men are less likely to have simple UTIs consider sexually transmitted infection as a cause.
Normal saline	For cleaning wounds and ulcers	On the first visit squirt normal saline or clean water quickly at the also. Do this until all the dirt has been removed. On other visits clean very gently using a sterile swab or cloth dipped in normal saline to avoid damaging the healing red skin.

Medicine	Uses	Dose
Nystatin Oral suspension 100 000 IU/ml	Oral candidiasis (thrush)	1ml x4/day for 7 days Retain in mouth for a few minutes
Ondansetron tab 4mg (dispersible)	Nausea and vomiting Not to be used under 6 months for vomiting due to gastroenteritis Not to be used in the first 12 weeks of pregnancy	Age Dose 6 months to 4 years 2 mg 5 years to 17 years 4 mg 18 years + 8 mg under lip or tongue x1
Omeprazole cap 20 mg 10 mg dispersible tab	Gastro-oesophageal reflux Peptic ulcer or gastritis	Suggest that the patient elevates the head of the bed by 15 cm. Use omeprazole for 3 days if necessary 20 mg x1/day (for an adult). Same dose treat for 10 days and review.
Oral rehydration salts (ORS) One packet to be dissolved in 1 L of water (3x330 ml soft drink bottles)	To treat dehydration To prevent dehydration after treating dehydration. To treat shock on the way to the hospital	See appendix 10: how to treat diarrhoea. To prevent dehydration tell patients to drink the fluids they usually drink and extra fluid. Give extra fluid after each loose bowel motion: Age Extra fluid Take home 0-2 years 100 ml 2 packets 2-9 years 200 ml 2 packets 10+ years 400 ml 4 packets Tell the patient that ORS will not stop the diarrhoea. Give some ORS which has been made up. Tell them to drink 5 ml every minute.
Paracetamol = Acetaminophen tab 500 mg	Pain Arthritis pain	Age Dose 0-5 years 1/4 tab x4/day 6-12 years. 1/2 tab x4/day 13+ years 1 or 2 tab x4/day Do not use more than these doses. Give enough tablets for 2 days of treatment.

Medicine	Uses	Dose								
<p>Penicillin</p> <p>Benzylpenicillin (Crystalline penicillin or "X pen") Injection 5 million IU (3 g) in a vial</p> <p>Procaine penicillin fortified (PPF) injection 4 million IU (4 g) in a vial 1 million IU = 1 g</p> <p>Phenoxymethylpenicillin ("Pen V") tab 250 mg</p>	<p>For severe infections that cause a general danger sign. Send patient to hospital immediately. For a sickle-cell crisis.</p> <p>For infections which need a large dose of antibiotic. For cellulitis or mastoiditis. Sent to hospital immediately. For gonococcal conjunctivitis (also give tetracycline eye ointment).</p> <p>For tonsillitis (if aged 5-15 and FeverPAIN score 4-5); diphtheria; acute dacryocystitis; cellulitis; a tooth abscess. (To prevent severe infections in sickle cell disease give twice a day: 1-11 months - 62.5 mg each dose; 1-5 years 125 mg each dose.)</p>	<p>0.1 million IU (60 mg) for each kg of body weight x1 (or four times a day if the patient is not able to get to the hospital immediately). Do not give more than 2 million IU. Inject into a muscle.</p> <p>0.1 million IU (100 mg) for each kg of body weight x1/day for 5 days. Do not give more than 1.2 million IU. Inject intramuscularly.</p> <table border="0"> <tr> <td>Weight</td> <td>Dose</td> </tr> <tr> <td>2-19 kg</td> <td>125 mg x3/day</td> </tr> <tr> <td>20-39 kg</td> <td>250 mg x3/day</td> </tr> <tr> <td>40 kg or more</td> <td>500 mg x3/day</td> </tr> </table> <p>Give 5 days treatment for most infections but treat a child aged 5-15 with Group A Streptococcus tonsillitis for 10 days.</p>	Weight	Dose	2-19 kg	125 mg x3/day	20-39 kg	250 mg x3/day	40 kg or more	500 mg x3/day
Weight	Dose									
2-19 kg	125 mg x3/day									
20-39 kg	250 mg x3/day									
40 kg or more	500 mg x3/day									
<p>Permethrin 5% cream 1% lotion</p>	<p>Scabies Close contacts should be treated at the same time regardless of whether they have symptoms or not.</p>	<p>Apply the cream to the whole body, including scalp, the area behind the ears, palms of the hands and soles of the feet, paying particular attention to skin creases and interdigital web spaces. Leave on for 24 hours, then rinse thoroughly with water. The skin can be itchy for almost 4 weeks after successful treatment.</p>								
<p>Povidone iodine = PVI 10% aqueous solution</p>	<p>For cleaning wounds and ulcers.</p>	<p>On the first visit use a syringe to push normal saline or teen water quickly at the ulcer until all the dirt has been removed. Then put povidone iodine on the wound. On other visits clean very gently using a sterile swab or cloth dipped in povidone iodine to avoid damaging the healing red skin.</p>								

Medicine	Uses	Dose
Praziquantel Tab 600 mg	Schistosomiasis Tapeworms Many flukes (but not Fascioliasis)	40 mg/kg as a single dose for Schistosoma haematobium and Schistosoma mansoni
Prednisolone tab 5 mg or 1 mg (5 mg of prednisolone has the same anti-inflammatory activity as 0.75 mg of dexamethasone or 20 mg of hydrocortisone) In areas where strongyloides exists: consider treating (possible strongyloides) with ivermectin or albendazole before starting long term steroids. Reduce long term steroids slowly.	Severe asthma COVID-19 complications when oxygen saturation is below 92% Severe immune reconstitution syndrome or low oxygen saturation with Pneumocystis Jirovecii Pneumonia	2 mg/kg x1/day for 3 to 6 days (max 30 mg) Adult 30 mg x1/day for 3 to 6 days Adult dose 30-40 mg x1/day for 7 days Adult dose 30-40 mg x1/day for 14 days then half that dose for 14 more days
Prochlorperazine tab 5mg injection 12.5 mg or 25mg	Nausea or vomiting	5 mg x3 per day orally, or 12.5 mg by injection, followed by 5 mg by mouth after 6 hours if needed
Promethazine tab 10 mg 20 mg or 25 mg Also injection 25 mg/ml	Nausea or vomiting	20 or 25 mg for adult (aged 10+) single dose or repeat after 12 hours
Progestogen only pill See Levonorgestrel		
Pyrimethamine 25mg + sulfadoxine 500 mg = Fansidar	To prevent malaria in pregnancy give three doses at least one month apart after the end of the first trimester. Do not use if taking regular co-trimoxazole	1575 mg (3 tabs) on each occasion at at least one month apart.
Quinine tab 300 mg (sometimes 200 mg)	For malaria in the first three months of pregnancy together with clindamycin	10 mg for each kg x3/day Do not give more than 600 mg x3/day Give 7 days treatment.
Quinine Injection 150 mg in each 1 ml or 300 mg in each 1 ml	For malaria if the patient has a general danger sign and artesunate nor artemether are not available. Or if the patient is in the first 3 months of pregnancy. Give quinine intramuscular. Repeat after 4 hours and then after each 8 hours whilst the patient continues to vomit.	10 mg for each kg one time. Do not give more than 600 mg for an adult. Repeat after eight hours if the patient is still vomiting. Give tablets when the patient is no longer vomiting. Give 7 days treatment in total.

Medicine	Uses	Dose
Retinol (vitamin A) tab or cap 25,000 IU, 50,000 IU, 100,000 IU, 200,000 IU	For night blindness, Bitot's spots, patients under six-year-old with a corneal ulcer, severe malnutrition and measles. Some countries (such as Zambia) give a single dose of vitamin A each 6 months between the ages of 6 months and 5 years of age.	Age Dose 0-1 year 100,000 IU 3 times 1+ years 200,000 IU 3 times Give the first dose immediately. Give the second dose on the following day or after finishing and antimalarial. Give the third dose two weeks later. Also advise about the mixed diet.
ReSoMal (REhydration SOLution for MALnutrition) oral Sachet containing 84 g of powder, to be diluted in 2 litres of clean, boiled and cooled water	For prevention of dehydration in children with complicated acute malnutrition	Child: 5 ml/kg after each loose stool as long as diarrhoea persists Child under 5 kg: 25 ml Child 5 to 9 kg: 50 ml Child 10 to 19 kg: 100 ml Child 20 kg and over: 200 ml Doses are higher if dehydration is present
Salbutamol metered dose inhaler 100 µg per puff via spacer (spacers can be made from clean plastic bottles)	For wheeze if there are no signs of respiratory distress and does not have fast breathing.	2-4 puffs via spacer each 10-30 minutes
Salbutamol tab 2 mg or 4 mg	For wheeze if there are no signs of respiratory distress and does not have fast breathing.	Age Dose Less than 1 year 1 mg x3/day 1-4 years 2 mg x3/day 5+ years 4 mg x3/day Give 5 days treatment.
Sildenafil tab 25 mg, 50 mg, 100 mg	For erectile dysfunction - sexual excitement will be needed to produce an erection. Higher doses may cause facial flushing or a headache. Use the smallest effective dose.	25 to 100 mg approximately 1 hour before sexual intercourse. Maximum dose is 100 mg in 24 hours. The benefit may last for up to 6 hours.
Silver sulfadiazine 1% cream	Burn Infected leg ulcers	Clean the wound and then apply 3-5 mm of cream to the wound and cover with a dressing. Clean the burn or ulcer each day initially.
Sodium bicarbonate ear drops	To soften and dissolve ear wax	2 or 3 drops x2/day for 5 days

Medicine	Uses	Dose
Tetracycline eye ointment 1% 4 g tube	For conjunctivitis caused by bacteria. For trachoma. For conjunctivitis caused by chlamydia (child older than 5 days but less than one month), together with erythromycin or azithromycin. For conjunctivitis caused by gonococcus (child less than 5 days old) together with procaine penicillin fortified. For corneal ulcer (if herpetic test for HIV and give aciclovir)	x2/day for 5 days x2/day for 6 weeks x1/day for 21 days x2/day for 5 days x1 and send to eye clinic
Thiamine tab 50 mg	Alcoholic confusion, nerve irritation or skin irritation especially of palms (Beriberi)	For adult: initial dose is 300 mg x1/day for one week then 100 mg x1/day until diet improves
Tinidazole tab 500 mg	Giardia Amoebiasis (prolonged dysentery)	Child: 50 mg/kg single dose (max. 2 g) Adult: 2 g single dose Same daily dose for amoebiasis, treat for 3 days if only affects the intestine (bloody diarrhoea for more than a week). (Treat for 5 days if liver is affected). It is dangerous to drink alcohol when using tinidazole.
Tramadol tab 50 mg	For severe short term pain	For adult (over 12 years) 50 mg each 4 hours. Maximum dose 100 mg x4 each day.
Tranexamic acid Tab 500 mg	Heavy periods (menorrhagia) (also for painful periods)	1 g (500 mg x2 tablets) x3 each day for 4 days from the onset of the period
Trihexyphenidyl tab 2 mg	Dystonic reactions to antipsychotic medication such as haloperidol	1 tablet x2/day for a day or two and review the need for the antipsychotic medication.
Salbutamol tab 2 mg or 4 mg	For wheeze if there are no signs of respiratory distress and does not have fast breathing.	Age Dose Less than 1 year 1 mg x3/day 1-4 years 2 mg x3/day 5+ years 4 mg x3/day Give 5 days treatment.
Silver sulfadiazine 1% cream	Burn Infected leg ulcers	Clean the wound and then apply 3-5 mm of cream to the wound and cover with a dressing. Clean the burn or ulcer each day initially.

Medicine	Uses	Dose				
Ulipristal Tab 30 mg	Emergency contraception Eg after condom breaking, missed pill or rape. Only reduces chance of unwanted pregnancy. An intrauterine device is more effective. Ulipristal will not terminate an existing pregnancy.	One tablet as soon as possible, preferably within 5 days. This is less effective than putting in an intrauterine device. About 1% of women get pregnant who take Ulipristal like this within 3 days. Start or restart a contraceptive pill 6 days after giving Ulipristal.				
Vitamin A: See retinol						
Vitamin B1: See thiamine						
Zinc tab 20 mg scored or dispersible tablet	Diarrhoea - in addition to ORS (not at the same time as iron (ferrous) medicine)	<table border="0"> <tr> <td data-bbox="1061 627 1165 672">Age</td> <td data-bbox="1165 627 1490 672">Dose</td> </tr> <tr> <td data-bbox="1061 672 1165 790">All ages</td> <td data-bbox="1165 672 1490 790">10 mg x1/day for 10 days</td> </tr> </table>	Age	Dose	All ages	10 mg x1/day for 10 days
Age	Dose					
All ages	10 mg x1/day for 10 days					
Whitfield ointment - see Benzoic acid and acetylsalicylic acid Ointment						

Artesunate injectable doses table

Weight	IV injection artesunate solution 10 mg/ml	IM injection artesunate solution 20 mg/ml
< 3 kg	1 ml	0.5 ml
3 to < 4 kg	1.2 ml	0.6 ml
4 to < 5 kg	1.5 ml	0.8 ml
5 to < 6 kg	2 ml	1 ml
6 to < 8 kg	2.5 ml	1.2 ml
8 to < 10 kg	3 ml	1.5 ml
10 to < 13 kg	4 ml	2 ml
13 to < 15 kg	4.5 ml	2.5 ml
15 to < 17 kg	5 ml	2.5 ml
17 to < 20 kg	6 ml	3 ml
20 to < 25 kg	6 ml	3 ml
25 to < 29 kg	7 ml	3.5 ml
29 to < 33 kg	8 ml	4 ml
33 to < 37 kg	9 ml	5 ml
37 to < 41 kg	10 ml	5 ml
41 to < 45 kg	11 ml	6 ml
45 to < 50 kg	12 ml	6 ml
50 to < 55 kg	13 ml	7 ml
55 to < 62 kg	15 ml	8 ml
62 to < 67 kg	16 ml	8 ml
67 to < 71 kg	17 ml	9 ml
71 to < 76 kg	18 ml	9 ml
76 to 81 kg ^(b)	20 ml	10 ml

Appendix 32 List of TB and Leprosy medicines

Abbreviations:

x1/day = od = one time a day

x2/day = bd = two times a day

x3/day = tds = three times a day

x4/day = qds = four times a day

x1 = stat = one time only

1/2 = one half

1/4 = one quarter

+= and above

tab = tablet cap = capsule

The contraindications, adverse effects and precautions are nicely summarised on the MSF Essential drugs publication. You can access MSF Essential drugs here:

<https://medicalguidelines.msf.org/en/viewport/EssDr/english/essential-drugs-16682376.html>

Medicine	Class	Important or Common Side effects	Interactions
Clofazimine	Multibacillary Leprosy	Causes skin to become orange. Occasionally it can trigger low mood or depression.	Clarithromycin, azithromycin, erythromycin, fexinidazole, aminophylline
Dapsone tab 25 mg, 50 mg, 100 mg	Leprosy (together with rifampicin and sometimes clofazimine)	Age Dose Under 10 years 2 mg/kg 10-14 years. 50 mg x1/day 15+ years 100 mg x1/day	No important interactions
Ethambutol	TB	Common: loss of colour vision and clarity	No important interactions
Isoniazid	TB prevention	Common: Diarrhoea, nausea, numb or weak hands or feet. Rare: Jaundice,	Give with pyridoxine 10 mg daily (5 mg if child less than 5 kg) to reduce chance of numb or weak hands or feet OK to use with Raltegravir
Rifampicin	TB and Leprosy	Common: Diarrhoea, nausea Rare: Rash, bleeding gums or bruising	Oral contraceptives can not be used Many Antiretrovirals (ART) OK with NRTI drugs Don't use with Nevirapine or Protease inhibitors Dolutegravir needs to be given twice a day rather than once a day Do not use with Raltegravir
Pyrazinamide	TB	Common: Diarrhoea, nausea, jaundice Rare: Gout	No common important interactions
Pyridoxine tab 10, 25 or 50 mg	Vitamin B6		Prevention of isoniazid neuropathy: Child under 5 kg: 5 mg x1/day Child over 5 kg and adult: 10 mg x1/day If a patient has isoniazid neuropathy the dose is higher: Adults 50 mg x3/day, child 50mg x1/day for up to 3 weeks.

Appendix 33 List of HIV medicines

Abbreviations:

x1/day = od = one time a day

x2/day = bd = two times a day

x3/day = tds = three times a day

x4/day = qds = four times a day

x1 = stat = one time only

1/2 = one half 1/4 = one quarter

+= and above

tab = tablet cap = capsule

The contraindications, adverse effects and precautions are nicely summarised on the MSF Essential drugs publication. You can access MSF Essential drugs here:

<https://medicalguidelines.msf.org/en/viewport/EssDr/english/essential-drugs-16682376.html>

Medicine	Class	Important or Common Side effects	Interactions
Dolutegravir tab dispersible 10 mg tab 50 mg Three 10 mg dispersible tablets are equivalent to one 50 mg tablet.	Integrase inhibitor	Common: Nausea, diarrhoea, headache, rash, itching, vomiting, abdominal pain or discomfort, difficulty in sleeping, dizziness, abnormal dreams, fatigue, flatulence Rare: Allergic (hypersensitivity) reaction (rash, fever, muscle pain, blistering), liver inflammation, weight gain Avoid if severe insomnia, anxiety, depression or hypersensitivity reaction .	Enzyme-inducing drugs (e.g. rifampicin, carbamazepine, phenytoin, phenobarbital, efavirenz, nevirapine): double the daily dose of dolutegravir (take twice a day). Take 5mg folic acid if using in first 3 months of pregnancy. Lower the dose of metformin with dolutegravir (250 mg to 500 mg x2/day with food).
Efavirenz	Non-Nucleoside Transcriptase Inhibitor (NNRTI)	Common: Rash, itching, dizziness, headache, abnormal dreams, anxiety, depression, difficulty sleeping, disturbed concentration, diarrhoea, nausea, vomiting, abdominal pain, tiredness Rare: Severe rash, psychosis, suicidal feelings , liver failure	Take on an empty stomach, preferably at bedtime Avoid if the patient has a serious psychiatric history
Etravirine	Non-Nucleoside Transcriptase Inhibitor (NNRTI)	Common: Anaemia, low platelet count, diabetes, raised blood sugar, triglyceride or cholesterol levels, anxiety, difficulty in sleeping, headache, heart attack, high blood pressure, indigestion and acid reflux, diarrhoea, nausea, vomiting, flatulence, abdominal pain, kidney failure, tiredness, rash, peripheral neuropathy (damage to nerves in the hands or feet) Rare: Severe rash (Stevens-Johnson syndrome)	Take with food

Medicine	Class	Important or Common Side effects	Interactions
Emtricitabine	Nucleoside Reverse Transcriptase Inhibitors (NRTI)	Common: Nausea, diarrhoea, vomiting, indigestion, headache, dizziness, weakness, fatigue, rash, itching, skin darkening, insomnia, abnormal dreams Rare: Lactic acidosis (too much lactic acid in the blood), liver damage	Take with or without food
Lamivudine	Nucleoside Reverse Transcriptase Inhibitors (NRTI)	Common: Nausea, vomiting, diarrhoea, headache, general feeling of being unwell, cough, runny nose, abdominal pain, hair loss, fever, insomnia, Take with or 1 rash, tiredness, muscle and joint pain without food Rare: Lactic acidosis (too much lactic acid in the blood), liver damage	Take with or without food
Nevirapine	Non-Nucleoside Transcriptase Inhibitor (NNRTI)	Common: Allergic (hypersensitivity) reaction, headache, rash (usually in the first six weeks of treatment), fatigue, abdominal pain, diarrhoea, nausea, vomiting, fever, raised blood pressure, hepatitis Rare: Severe rash (Stevens-Johnson syndrome)	Take with or without food Fluconazole interaction.
Raltegravir	Integrase inhibitor	Common: Loss of appetite, headache, difficulty in sleeping, abnormal dreams, depression, dizziness, vertigo, restlessness, abdominal pain, bloating, flatulence, diarrhoea, nausea, vomiting, indigestion, rash, weakness, fatigue, fever Rare: Allergic (hypersensitivity) reaction (rash , fever, muscle pain, blistering), suicidal thoughts and behaviours, liver failure, kidney failure	Take with or without food
Tenofovir disoproxil (TDF) Avoid if renal disease (swap to TAF)	Nucleoside Reverse Transcriptase Inhibitors (NRTI)	Common: Nausea, vomiting, diarrhoea, flatulence, dizziness, weakness, fatigue, rash, headache, abdominal pains, and bloating Rare: Kidney problems , bone thinning	Take with food
Tenofovir alafenamide (TAF) Avoid if pregnant or TB	Nucleoside Reverse Transcriptase Inhibitors (NRTI)	Common: Nausea, vomiting , diarrhoea , flatulence, dizziness, weakness, rash, headache , abdominal pains, and bloating Rare: Angioedema, pancreatitis	Take with food

Medicine	Class	Important or Common Side effects	Interactions
Truvada (Tenofovir disoproxil with emtricitabine)	Nucleoside Reverse Transcriptase Inhibitors (NRTIs) x2 =“backbone”	See Tenofovir and Emtricitabine	Best taken with food, but can be taken on an empty stomach
Preventative medications used for many patients with HIV:			
Isoniazid	TB prevention	Common: Diarrhoea, nausea, numb or weak hands or feet. Rare: Jaundice,	Give with pyridoxine 10 mg daily (5 mg if child less than 5 kg) to reduce chance of numb or weak hands or feet OK to use with Raltegravir
Pyridoxine tab 10, 25 or 50 mg	Vitamin B6		Prevention of isoniazid neuropathy: Child under 5 kg: 5 mg x1/day Child over 5 kg and adult: 10 mg x1/day If a patient has isoniazid neuropathy the dose is higher: Adults 50 mg x3/day, child 50mg x1/day for up to 3 weeks.
Fluconazole	Anti-fungal Often given regularly if CD4 count is less than 100 cells/mm ³ and not possible to check CrAg as a preventative medication.	Common: gastrointestinal disturbances, headache, skin reactions Rare: severe anaphylactic reactions; severe liver disorders, bleeding or bruising, increased infections	Avoid in first 3 months of pregnancy. Avoid or monitor combination with: erythromycin, haloperidol, quinine warfarin, carbamazepine, phenytoin, rifabutin, benzodiazepines, amlodipine, certain antiretrovirals (e.g. nevirapine)
Folic acid tab 5 mg	A vitamin that protects unborn babies from neural tube defects including spina bifida		Should be taken by all women preparing for pregnancy and in first 3 months of pregnancy when on co-trimoxazole

Tuberculosis medications: See appendix 32

IRIS and PCP:

Prednisolone (steroid)

- for severe immune reconstitution inflammatory syndrome (IRIS) 40 mg/kg x1 for 14 days then 20 mg/kg for 14 days;

- for low oxygen saturation (below 92%) with Pneumocystis Jirovecii Pneumonia (PCP or PJP) 30-40 mg x1/day for 7 days and review. They may need a reduced dose of prednisolone for another 10-14 days.

Appendix 34 Infectious causes of fever

Signs or symptoms	Possible causes
Signs of meningitis, convulsions	Meningitis, severe malaria
Abdominal pain, peritonitis signs	Appendicitis, peritonitis, typhoid fever
Diarrhoea, vomiting	Gastroenteritis, typhoid fever
Jaundice, enlarged liver	Viral hepatitis
Cough	Pneumonia, measles, tuberculosis (longer than 2-3 weeks)
Ear pain, red ear drum or discharge from ear	Otitis media
Sore throat, enlarged lymph nodes	Streptococcal pharyngitis, diphtheria
Pain when passing urine, urinary frequency, back pain	Urinary tract infection
Red, warm, painful skin	Erysipelas, cellulitis, abscess
Limp, difficulty walking	Osteomyelitis, septic arthritis
Rash	Measles/dengue/haemorrhagic fever/chikungunya
Bleeding. For example: into the skin (press on a dark red or purple rash), nose bleeds, bleeding from the gums	Dengue, haemorrhagic fever
Joint pain	Rheumatic fever, chikungunya, dengue

This table is modified from medicalguidelines.msf.org

If there is malaria in your area, or wherever the patient has been travelling, test for malaria. Consider testing for HIV if the patient might be at risk, or if they have an infection made more common by HIV. Consider doing any relevant test if available: <https://medicalguidelines.msf.org/en/viewport/CG/english/fever-16689066.html>

Appendix 35 Hepatitis and Jaundice

Jaundice is the main symptom of hepatitis.

Viral hepatitis A is the most common cause of jaundice, but the illness is often mild and the jaundice may not be noticed. Hepatitis A and hepatitis E are caused by drinking water or eating food made dirty with human faeces. Hepatitis B and C are more serious illnesses transmitted sexually or by dirty needles.

Jaundice is also caused by severe malaria, glandular fever or by infection with other parasites (for example leptospirosis, sleeping sickness, hydatid disease, opisthorchis and even ascaris) or other viruses such as yellow fever. Alcohol, some medicines or herbal treatments can cause jaundice. These include medicines for tuberculosis, for HIV, for psychiatric problems, and paracetamol. Jaundice is also linked with some genetic conditions such as haemoglobinopathies and G6PD deficiency. Aflatoxins in maize and nuts spoiled by aspergillus fungus can also cause hepatitis and jaundice.

To diagnose jaundice, ask the patient to look upwards. If the white part of their eyes are yellow, the patient has jaundice. Only look for jaundice in sunlight. If a patient with jaundice seems unwell - for example they are drowsy, have a fever or vomiting or if they have a fast pulse or fast breathing send them to hospital immediately. All patients with jaundice should be seen by an experienced clinician urgently to make a diagnosis. If the patient has severe pain in the right upper abdomen they may have a gallstone in the gall duct or cholangitis (with a fever). An ultrasound of the abdomen may be helpful.

- If the cause of the jaundice is hepatitis A, the patient needs no treatment and the jaundice usually improves in 2 weeks. Advise patients with hepatitis to rest, to eat a mixed diet and not to drink alcohol for 3 months.
- If medicines could be the cause of the jaundice, tell the patient to stop taking the medicines.
- If the jaundice does not improve within 2 weeks the patient should be tested for hepatitis B and C. Both hepatitis B and C can cause cirrhosis (scarring of the liver) and liver cancer. Treatment may be available for both.

Patients over age 10 who have both hepatitis B and HIV can be treated with ART that includes Lamivudine and Tenofovir disoproxil. These 2 antivirals work against both hepatitis B and HIV. Resistance of hepatitis B to Tenofovir disoproxil is very rare. But Lamivudine should not be used as the only hepatitis B retroviral medicine because doing this will cause the virus to develop resistance to Lamivudine.

Hepatitis B and hepatitis C are more infectious than HIV. Partners are protected by condom use and hepatitis B vaccination (when relevant). Healthcare workers should be vaccinated. As should newborn babies of infected mothers. Other close contacts are protected by educating the patient about how hepatitis is spread. Progress of liver disease is minimised by safe alcohol consumption. Long term treatment is available for hepatitis B. Hepatitis C can be cured if the treatment is available. Donated blood must be tested for hepatitis B and C and HIV.

Appendix 36 Pain

Pain is often a signal to the body that something is wrong. The type and site of the pain will give you clues to what the cause of the pain is. It is usually better to give treatment that will either cure the illness or improve the problem rather than just give painkilling medicines. Please type *pain* in the pdf search tool: 🔍 . You will find plenty of causes for pain in various parts of the body. Pain medicines often cause harm. If you have to use a pain killer for severe pain, choose the right type of painkiller and make sure that it is a safe choice.

Types of pain

Crushing or gripping pain in front of the chest may be caused by a heart attack or angina. It may also seem to move to the shoulder neck or arm. If the patient is having a heart attack they may also be nauseated pale and sweaty. Burning or electric shock pain is often from an irritated nerve. For example in shingles (herpes zoster) or sciatica. Colic or spasms of pain may be caused by pain in an irritated or blocked tube. For example gastroenteritis or renal colic. In the case of renal colic the pain is so severe that it will usually make the patient vomit.

Severity of pain and site of pain

It may not be necessary to treat mild pain, but moderate and severe pain will often need short term treatment until you can treat the illness. The severity and site of the pain will often give you a good clue as to the cause.

Options for pain relief

- Some types of pain are most likely to be helped with exercises and activity, or a lifestyle change, rather than a medicine. Youtube has some good examples of exercises for painful conditions. For low back pain, osteoarthritis pain and neuropathic pain we recommend <https://pain-calculator.com> to you. The website will help you to understand that activity is more important than painkillers for these conditions, and that painkillers often cause unwanted symptoms.
- Many types of pain are made worse by emotional stress. Tension headaches for example are best treated by massage, meditation, relaxation techniques or by regular exercise. Many people experience functional pain in which there is no fever or investigation that shows physical illness. These functional illnesses are usually helped by improving sleep patterns, nutrition and activity levels.
- For mild pain: paracetamol is often a good choice, but it is only as good as a placebo (a medicine or treatment that has benefit because the patient believes it will work) for back pain. It is safe for most patients if the dose is correct. Rub on painkillers, such as ibuprofen cream, are often useful for local pain.
- Oral ibuprofen, naproxen and diclofenac (all Non Steroidal Anti-Inflammatories NSAIDs) should not be used if the patient has uncontrolled high blood pressure, heart failure, kidney failure, diabetes, a history of peptic ulcer or gastritis, or during pregnancy.

· Codeine, tramadol and morphine can be used for short term pain relief of severe pain, but they often cause constipation, drowsiness, nausea and vomiting, and don't work for long term pain. They can be habit forming and addictive in some people. If you have to give morphine for the first time: you may need to give a medicine for nausea for the first day or two. Start with low doses to avoid drowsiness and slowing of the breathing (and death).

· Low dose amitriptyline (5-25 mg at night) is often very helpful for nerve pain, but it can take a while to work. It should be taken at a low dose at night, for example: 10 mg, and the dose may need to be reduced if the patient is too drowsy in the morning, or too dry in the mouth. The dose can be slowly increased to 25 mg at night. Amitriptyline will often help with sleep and anxiety.

· Severe, one sided, throbbing headache is often caused by migraine headache. This can often be treated with a NSAID medication (naproxen and ibuprofen are much safer than diclofenac). You may need to give a medicine for nausea at the same time.

· Diclofenac given intramuscularly works well for renal colic.

· If a patient has severe pain in the face without tooth tenderness they may have trigeminal neuralgia. Carbamazepine is useful for this, but it should not be used if there is a chance of pregnancy.

· For a wound that needs deep cleaning or stitches: a local injection of lidocaine into the wound is effective. Don't forget to make sure that the patient's tetanus vaccinations are up-to-date.

Appendix 37 Venomous bites and stings

Snake bites usually happen at night. People walk barefoot and stand on a snake, or reach for something with their hands. Therefore, more than 90% of all snakebites are on feet, lower legs and hands. Different types of snakes affect us humans differently, but most snake bites are not dangerous to humans. The effect of a bite on a person depends on the type of venom (poison) that is injected. Usually, the snake is only able to inject a small amount of venom. Half of all snake bites don't include venom. Not all snakebites that inject venom are a danger to humans as many snake venoms are mild.

If the type of snake has been identified, this can help treatment. We advise only to take a picture of the snake if it is safe to do so. Do not waste time searching for the snake. Watching the symptoms can help the clinician to decide what to do next.

1. If the snake spat in the patients' eyes: wash the eyes with plenty of water. Even urine will help if there is no water available.
2. Do not cut and / or suck the bite site. Do not rub or wipe the bite site. Inspect the bite site. If there is a piece of fang sticking in, remove it carefully.
3. Tell the patient to calm down. If the patient is calm, the venom spreads slower.
4. Keep the bitten arm or leg still and slightly lifted. Do not cut off the blood flow or use a pressure bandage unless the bite is confirmed to be by a Black mamba (this should be confirmed by an expert).
5. Send the patient to hospital. If the snake has already been killed, take it to the hospital together with the patient. If the snake is not dead, leave the snake alone. Remember that even a dead snake can still inject venom.
6. If the patient vomits, turn them on their left side. This will prevent the patient from choking on their vomit.

There are 3 main types of snake venom that cause different sets of symptoms:

- A. Painful progressive swelling: there is severe pain and swelling at the bite site
- B. Progressive weakness: there is usually only mild or moderate pain. There is rarely swelling. Nerve-based signs and symptoms: droopy eye lids, blurred vision, slurred speech, tingling around lips and nose, too much saliva, difficulty swallowing. Nerve damage may result in paralysis of the breathing muscles.
- C. Bleeding problem: Signs and symptoms that are slow to appear. Bleeding from a bite site and from mucous tissue (eyes, nose, ears, gums). Some snakes cause a mixture of A and C symptoms.

90% of serious snake bites are group A in Zambia.

On arrival at a health facility, the following are needed:

1. Check the usual measurements that you check in your clinic (temperature, pulse rate, oxygen saturation, weight blood pressure, breathing rate).
2. It is very important to watch the blood pressure, heart rate and breathing rate. For example check these each hour.
3. Lay the patient down with the bitten arm or leg slightly raised (for example on two pillows). If the patient is bleeding from the bite area, more than an hour after the bite : lift the arm or leg much higher. The patient should avoid moving the arm or leg.
4. Put a drip tube into a vein. Give normal saline solution if the pulse is above 100 at rest. Giving oral rehydration solution, by mouth, is an alternative when normal saline and a drip tube are not available.
5. Remove any jewellery from the arm or leg and mark the area of the bite and any swelling with a pen.

6. Give tetanus toxoid immunisation.
7. If needed give a painkiller. Paracetamol for mild pain, with a mild opioid such as tramadol or codeine for moderate to severe pain.
8. If possible do a full blood count.
9. Watch to see how much urine the patient passes each day.
10. Keep the patient at the health facility for at least 12 hours even if there are no obvious venom symptoms. Contact a snake expert.

Avoid: - antibiotics unless the skin was cut, or there are signs of infection, blisters, necrosis;
 - steroids and NSAIDs including aspirin and ibuprofen.

If there is severe pain, severe swelling (swelling that increases faster than 10 cm per hour or swelling that goes beyond the elbow or knee), active bleeding, blood clotting problem or progressive weakness, antivenom may be required.

How to check for a blood clotting (bleeding) problem: draw blood from patient and put the blood in a clean glass tube or a glass jar. Draw blood from a healthy person and do the same in a second glass jar. Leave both at room temperature for 20 minutes. Tilt both jars to check clotting. Check again daily until 2 days after the bite.

In case of a snakebite in Zambia, immediately contact the national snakebite expert via 0974248144 for free advice. HHISS produce a useful poster for medical professionals: <https://hiss.com/wp-content/uploads/2024/01/1-Poster-Zambian-guidelines-for-the-management-of-snakebite.pdf>

Watch (In Zambia) for the following problems as time passes after the bite (these times are unreliable):

Bite with venom (fang marks or pain at bite site)			
10-30 minutes	Rapid pulse, low blood pressure, small pupils, sweating and salivation, difficulty swallowing, breathlessness, numbness, weakness	Cobra and Black Mamba	Intravenous line. Consider antivenom.
	Local pain, tissue swelling	Adders, spitting cobras and stiletto snake	Intravenous line. Consider antivenom. Pain killers (not aspirin)
30 minutes to 5 hours	Cobra syndrome - both eyelids droop, spasm in jaw muscles, breathing paralysis. Low blood pressure and rapid pulse	Cobra and Black Mamba	Ventilate and treat shock
30 minutes to 48 hours	Nose bleeds, bruising in skin. Disseminated Intravascular Coagulation (DIC). Low blood pressure and fast pulse.	Boomslang, Twig snake, Puff Adder, Gaboon Adder, Black-necked spitting cobra	Check clotting (see above). Consider transfusion if severe anaemia.
6 hour or more	None of the above signs and normal clotting		Consider sending home at 24 hours
	Tissue necrosis		Remove blisters, daily dressings, consider removing dead tissue after 15 days.

Scorpion stings are extremely painful for about 8 hours and can be treated with a local anaesthetic injection or a by a local healer with appropriate skills (cutting is inappropriate). It is very unusual for them to be dangerous and there is no effective antivenom.

Spider bites can cause painful necrotic ulcers. If there are dangerous spiders in your area: learn how to manage their bites. The only medically significant spiders in Zambia are brown button spiders.

However, they rarely bite. Other spiders are big and give a painful bite. Consider giving a local anaesthetic injection. Do not cut or suck the wound. Do not try to remove black tissue.

Bee and wasp stings: the stinger should be removed and the skin washed. Treat anaphylaxis if present. See lesson 10.

Appendix 38 Sleep questionnaire For use if difficulty sleeping for 4 weeks or more

Over the past month:	Circle the best answer				
	Never	Rarely	Occasio n-ally	Most nights or days	Always
1. Do you have trouble falling asleep?	1	2	3	4	5
2. Do you have trouble staying asleep?	1	2	3	4	5
3. Do you wake up un-refreshed?	1	2	3	4	5
4. Do you take anything to help you to sleep?	1	2	3	4	5
5. Do you use alcohol to help you to sleep?	1	2	3	4	5
6. Do you have any medical conditions to disrupts your sleep?	1	2	3	4	5
7. Have you lost interest in hobbies or activities?	1	2	3	4	5
8. Do you feel sad, irritable or hopeless?	1	2	3	4	5
9. Do you feel nervous or worried?	1	2	3	4	5
10. Do you think something is wrong with your body?	1	2	3	4	5
11. Are you a shift worker or is your sleep schedule irregular?	1	2	3	4	5
12. Are you legs restless and/or uncomfortable before bed?	1	2	3	4	5
13. Have you been told that you are restless or that you kick your legs in your sleep?	1	2	3	4	5
14. Do you have any unusual behaviours or movements during sleep?	1	2	3	4	5
15. Do you snore?	1	2	3	4	5
16. Has anyone said that you stop breathing, gas, snort, or choke in your sleep?	1	2	3	4	5
17. Do you have difficulty staying awake during the day?	1	2	3	4	5

Appendix 39 Sleep hygiene

Lions sleep for 20 hours a day. We need much less.

The number of hours is not important. Relax and enjoy the time off your feet.

Avoid:

x Caffeine in the evening. There is caffeine in: coffee; tea; some soft drinks including coke; and some pain killers.

x Alcohol in the evening. Alcohol may help you fall asleep but it will usually make your sleep poor quality. You are likely to wake after about 4 hours feeling alert or anxious.

x Smoking in the late evening. By the way: vaping (e-cigs) is much safer than smoking.

x Meals in the late evening.

x Day time naps.

x Sleeping in front of the television. You will get poor quality sleep in a chair. Usually a television in the bedroom will keep you awake longer.

Helpful hints:

✓ Only lie down to sleep when you feel sleepy. Otherwise do something interesting, like reading.

✓ Cover clocks so that you can't see them from the bed.

✓ If you think of something that you need to do, write it down. Thoughts and worries can be thought, or worried about, later.

✓ Stop trying to sleep. Resting in bed is almost as good.

✓ Take regular moderate exercise but not just before bed time.

✓ Try drinking a warm milk drink before going to bed.

✓ Try a relaxation tape. These are available in libraries and book shops.

✓ Go to bed, and get up, at the same time each day.

Illness and sleep:

? Are you in pain?

? Do you wake up very early every morning?

? Do you feel low, sad or depressed most of the time?

? Do you find it very difficult to switch off from the stresses in your life?

? Do you have any problem that you think a health professional might be able to help you with?

✓ Consider talking to a counsellor, a clinician or a traditional healer.

Safe alcohol intake:

✓ Up to 3 units per day.

✓ No more than 14 units per week.

x Drinking unsafely will affect how well you sleep. Alcohol might help you to get off to sleep a little sooner, but you are likely to have poor quality, un-refreshing sleep. Alcohol can make sleep apnoea worse, or cause you to wake with a full bladder.

Sleep apnoea:

? If you are a heroic snorer ask your sleeping partner to watch you when you are sleeping for 30 minutes.

If your sleep partner says that you stop breathing you should fill in an Epworth sleepiness score. Please see the following page.

Appendix 40		Epworth sleepiness score		
Situation	0 = would never doze	1= slight chance	2 = moderate chance	3 = high chance
Sitting and reading				
Watching TV				
Sitting still in a public space				
As a passenger in a car for an hour without a break				
Lying down to rest in the afternoon when circumstances allow				
Sitting and talking to someone				
Sitting quietly after lunch without having drunk alcohol				
In a car or bus while stopped for a few minutes in traffic				
Total score				

What does my Epworth score mean?

- **0-5** lower normal daytime sleepiness
- **6-10** normal daytime sleepiness
- **11-12** mild excessive daytime symptoms
- **13-15** moderate excessive daytime symptoms
- **16-24** severe excessive daytime symptoms

If your score is 11 or higher you may wish to talk to your clinician to see what can be done to confirm a diagnosis of sleep apnoea.

If you have sleep apnoea you will have a much higher chance of having a heart attack and stroke. We recommend that you reduce your alcohol intake to a safe intake. If you are overweight, or obese, and you are able to lose as little as 5 kg of your body weight, your sleep apnoea is likely to improve.

You may be offered a CPAP machine to wear as you sleep. This will keep your airway open when you are sleeping. All of these treatment options may give you more energy, reduce your blood pressure and reduce your chance of having a heart attack or stroke.

Appendix 41 Emotional or Mental Health Symptoms

Diagnose and Treat the most important psychiatric problem first (lowest number only).

Rule out delirium and look for the most important psychiatric problem. In other words: look to match symptoms in box 1 first. Then check box 2, then box 3, then box 4, then box 5 until you find a match.

1 First rule out delirium (indicates severe illness needing immediate treatment):

- Recent onset of changing level of consciousness
- Varying levels of drowsiness and alertness
- Unaware of surroundings
- Unsure of the day of the week, time of day or own name
- Poor attention span

Treat delirium:

- Check glucose if possible. If unable to measure or if glucose less than 3.5 mmol/l give glucose intravenously (50ml of 50% glucose can be irritating to the veins, so if possible give 2ml per kg body weight 10% glucose eg 120ml for an adult) quickly.
- If you don't have intravenous glucose and the patient is conscious: give him 50 ml of sugar water or milk.
- **If temperature is 38 degrees C or above:**
 - Test for malaria if possible. If the malaria test is positive, or if no test is available, give Artesunate into a muscle (or a vein if you have been trained), 2.4 mg/kg for an adult, or 3mg/kg for children less than 20kg. Where intramuscular artesunate is not available: use intramuscular artemether, or if that is not available, use intramuscular quinine.
 - If the patient is NOT pregnant, NOT breast feeding or NOT less than 1 month old, give an injection of chloramphenicol intramuscularly, 40 mg or 0.2 ml for each kg of body weight. Do not give more than 1000 mg (5.6 ml) of chloramphenicol.
 - If there is no chloramphenicol, or if the patient is pregnant, breastfeeding, or less than 1 month old, give benzylpenicillin intramuscularly (one dose of 0.1 million IU for each kg of body weight for each kg of body weight, or give this dose four times a day if the patient is not able to get to the hospital immediately). Do not give more than 2 million IV of benzylpenicillin in each dose.
- Refer to hospital on the same day. Try to find out if this might be caused by a head injury, or by alcohol intoxication, or by alcohol withdrawal.

If the patient with emotional health or mental health symptoms does not have delirium check box 2:

2 ? Long term slowness of thought

- ? Problem solving difficulties
- ? Poor memory
- ? Low mood
- ? Slowing down of thought and a reduction of physical movements

Means **Dementia** likely

Dementia might be HIV related. If status unknown test for HIV.

If HIV positive: - Response to ART (Anti-Retroviral Treatment) is often good

If HIV negative: - Refer for specialist (psychiatric) assessment. A family member should accompany.

If the patient with emotional health or mental health symptoms does not have dementia check box 3:

3 ? Delusions - fixed false beliefs
? Hallucinations eg hearing voices or seeing visions
? Disorganised speech and behaviour
? Social or occupational disruption
Means **Psychosis** likely

Refer for specialist (psychiatric) assessment.
May need medication such as haloperidol and or lorazepam
Will often need investigations to understand the cause

If the patient with emotional health or mental health symptoms does not have psychosis check box 4:

4. ? Depressed mood
? Loss of pleasure
? Changes in appetite or sleep
? Poor concentration, poor libido, poor energy
? Tearful or agitated
? Slowing down of thought and a reduction of physical movements
Means **Depression** likely

- In the HIV patient: depression can occur following diagnosis or happen when falls ill
- Look out depression after child birth, especially in those with poor social support
- Ask about suicidal thoughts and plans. Arrange same day referral if suicidal
- Explore emotional and social issues
- Refer same week for specialist (psychiatric) assessment. In your area sometimes this may be a traditional healer who understands how to support people emotionally and socially.
- HIV patients: Efavirenz may cause depression. Refer to HIV specialist for a drug change.

If the patient with emotional health or mental health symptoms does not have depression check box 5:

5. ? Feeling excessively worried
? Agitation
? Panic attacks
? Obsessive behaviour
? Compulsive thoughts
Means **Anxiety** likely

- In the HIV patient: anxiety commonly occurs around the time of testing and diagnosis, as well as with advancing disease
- Psychological and social support
- Refer for specialist assessment if anxiety persists despite counselling and support

Appendix 42 Protocol for preventing strokes and heart attacks

How to support people with high blood pressure, type 2 diabetes, obesity, high cholesterol, kidney problems (chronic kidney disease), possible sleep apnoea, a smoking habit or hazardous alcohol use.

Assess the problem:

This will involve talking to the person to find out more about their general health, making some measurements and perhaps doing some simple urine or blood tests.

If the person is pregnant, or could become pregnant, their treatment will be different.

Please read the blood vessel and heart lesson about heart problems in diagnosisandtreatment.org. If the person has symptoms, or signs, that suggest another health problem, then please follow the guidance in the lesson. Examples might be:

- excessive breathlessness, or a crushing pain in the chest during exertion (possible heart failure or angina);
- loss of the ability to move an arm, leg or one side of the face, or a problem with speech (a stroke).

Measurements:

- Blood pressure (x3 if the first reading is above 140/90)
- Pulse rate and rhythm: if the pulse is very fast - above 110 per minute (at rest and not anxious) for an adult; or completely irregular; urgent medical treatment may be needed.
- Oxygen saturation if possible, especially if the patient is breathless, or has symptoms of possible COVID.
- Weight
- Height
- Waist circumference (just above the belly button). The patient's ideal waist is half their height (or slightly less). Divide their waist by their height. The waist to height ratio should ideally be 0.4 to 0.5.

Tests:

- If the blood pressure is raised (above 140/90), dip the urine for protein, blood and glucose.
- If the person has symptoms of diabetes, and the urine shows glucose, check the urine also for ketones (ketones with glucose may suggest type 1 diabetes, which needs urgent assessment and possibly urgent insulin). Please ensure that your ketone test strips are not out of date. Out of date ketone test strips often give false positive results.
- If available, and there is glucose in the urine, consider doing a finger prick glucose level, if you suspect type 1 diabetes.
- Protein might suggest a kidney problem. Blood might suggest urinary schistosomiasis. See appendix 17 to find out how to interpret urine results.
- If there is protein in the urine, or a persistently high blood pressure, it would be helpful to do a blood test to check kidney function (a U+E test).
- Consider a blood test (usually a finger prick) for total cholesterol number and HDL cholesterol numbers. This test may not be easily available
- If cholesterol testing is not easily available: use the local average numbers for total and HDL cholesterol numbers when you enter their information in the toolkit. For example in Zambia a typical number for total cholesterol is 4.45 and a typical number for HDL cholesterol is 1.14
- If the average blood pressure is above 180 systolic or above 110 diastolic it would be worth requesting an ultrasound of the kidneys and bladder. Especially for younger patients.

Option 1 Some sharing of the choices with the patient

- In a busy outpatient clinic you may not have time to use a website. It is important that you help the patient to bring a very high blood pressure down, or get diabetes symptoms (thirst and passing a lot of urine at night) under control.
- Use our BP and Diabetes protocol flow sheets to guide how to treat these problems.
- Staple a copy of our clinic data sheet into the patient held (paper) record.
- Please ask an experienced clinician to help you to set up a clinic for looking after people with high blood pressure and type 2 diabetes.
- Don't forget how important lifestyle choices are to blood pressure and diabetes control. A low sodium diet makes a big difference to blood pressure control as does sitting less and moving more. Following the low GI eating plan makes a huge difference to type 2 diabetes symptoms. Reducing the waist to height ratio to less than 0.5 makes a big difference to both blood pressure and diabetes control and can get rid of sleep apnoea, type 2 diabetes and high blood pressure.

Option 2 Sharing the future with the patient:

- You will need some time to sit with the patient to fill in their information, on the [Reduce my chance of stroke toolkit](#) online. Use this link: <https://alpha.patientcentre.org/calc/>
- For patients who speak Nyanja. Please use this link:
- If this is the first time that you have used the toolkit: please watch some of the introductory videos. This might take you 10 minutes (if you miss out the video of a shared decision-making conversation). Then click the link to [Reduce my chance of heart attack and stroke](#).
- Enter all of the patient's details. Use the average local total and HDL cholesterol numbers unless you have the patient's own results. For example: in Mfuwe the average total cholesterol is 4.45 and the average HDL cholesterol is 1.14.
- You will find out, together, what the patient's personal chance of having a stroke or heart attack is in the next 10 years.
- **The toolkit will firstly give you key information. You should talk together about this key information.**
- **The toolkit will secondly offer you some lifestyle options. It will tell you how much benefit you will get from following each option.**
- **The toolkit may thirdly also offer you some medication options. It will tell you how much benefit you will get from following each option.**

Support the patient to read the information that they are given by the toolkit, and to watch any relevant videos. This may take 20 minutes. Then support the patient to share their thoughts, priorities, questions and concerns. You can record these using the toolkit, and save their information at the bottom of their results page. All of this information will guide you, and the patient, to decide what is most important for you both to do next. Save a copy of their results, and record a shared plan in the patient's records.

When to treat high blood pressure with medication:

If the average (systolic or top) blood pressure is 180 or more, start the patient on a blood pressure tablet. The risk of stroke is too high at this level and most patients and clinicians would choose to start medication. Lifestyle changes are also important for these patients.

(If the average diastolic (lower) blood pressure is 110 or more start a blood pressure tablet).

If the average systolic blood pressure number is 140 or more, this is high. Use the website with the patient to decide what options might work for each patient.

Most people should aim to get their blood pressure to less than 140 with a combination of lifestyle and medications. If your patient is over 80 years the target is a little higher at: less than 150.

How to choose which medication to use for high blood pressure:

If the average systolic blood pressure is 180, or more, the patient will probably need 2 medications (and sometimes more), to bring their blood pressure down. Of course, lifestyle changes will also help. And treating sleep apnoea (by losing weight if needed, and cutting back alcohol intake if needed), will often make a big difference to blood pressure.

Moduretic (also known as triuretic) (hydrochlorothiazide 50 mg with amiloride 5 mg) is a good choice for these patients, since it has 2 medications in it, but the correct dose for high blood pressure is a 1/4 of a tablet every day, long term. These medications are not a good choice for patients who have attacks of gout or for pregnant women.

Enalapril 5 mg (half a 10 mg tablet), every day long term, is a good choice for most people, but occasionally (in 1 in 10 people) it can cause a dry cough. It can take a while for the cough to start, and a while for the cough to stop after stopping enalapril. Enalapril should not be used by women who are planning to become pregnant or who are pregnant. Nor should they use most other medications that are usually used for high blood pressure.

Amlodipine 5 mg, every day long term, is a good choice for most people, but occasionally it can cause ankle swelling towards the end of the day. If this happens: reduce the dose to 2.5 mg a day (half a 5 mg tablet).

Spironolactone 12.5 mg, every day long term, is occasionally needed for patients with extremely high blood pressure. The pharmacy may stock this as 50 mg tablets (and the dose for high blood pressure would be 1/4 of a tablet each morning), or as 25 mg tablets (and the dose would be 1/2 of a tablet each morning).

Nifedipine is known to bring blood pressure down, but there is no good evidence that it prevents strokes. So, it is not recommended as a long term treatment for high blood pressure, unless a woman is either pregnant or planning to become pregnant. Nifedipine is sometimes used when the systolic blood pressure is found to be very high (above 200 for example) for emergency treatment in the short term.

Atenolol is also known to bring blood pressure down, but there is no good evidence that it prevents strokes. So, it is not recommended as a long term treatment for high blood pressure. Atenolol is sometimes used when the patient has angina, to slow the heart rate down, but it should not be used if the patient has asthma (atenolol can make the wheeze or breathlessness much worse) or if the patient already has a pulse rate less than 60 at rest.

It is very important that the patient knows to avoid nonsteroidal antiinflammatories (NSAIDs eg ibuprofen, diclofenac, naproxen) and steroids whenever possible, since these medicines cause fluid retention and raise blood pressure. Some sex hormones including oestrogen, in the combined oral contraceptive, should usually be avoided.

Apart from making sure that your patients are not taking medication like NSAIDs it is important to check that the patient is using the medications that you have recommended regularly and that they don't cause them any unwanted symptoms. There is no point in adding in another medication to lower their blood pressure unless you know that they are taking the first medication regularly.

When to use medication for type 2 diabetes:

Most patients with type 2 diabetes will choose to start metformin. It is a very safe medication. If the patient has symptoms with diabetes (thirst, passing a lot of urine, weight changes) please check that

they don't have type 1 diabetes (see above - ketones in the urine, a particularly high blood glucose and recent weight loss suggest type 1 diabetes).

If the patient has symptoms of diabetes and does not have type 1 diabetes please start them on metformin straight away (unless they have severe kidney failure).

The dose of metformin will need to be increased very slowly to avoid side effects (loose stool or nausea). Start by taking 1/2 of a 500 mg tablet with the main meal.

Increase the dose very slowly, for example the dose can be increased every month by 1/2 a tablet. So after one month the patient will be taking 1/2 a tablet with 2 main meals per day.

If the patient gets side effects consider dropping the dose.

Finally, the patient will aim to get the dose up to 500 mg with each main meal (for example 500 mg, 2 times a day).

Some patients with bad diabetes symptoms will prefer to increase the dose of metformin more quickly. Metformin reduces the sugar levels, but mostly it protects the blood vessels and prevents strokes and heart attacks. If the patient has bad side effects: consider giving them 1/4 tablet with each meal. Again, increase the dose very slowly.

Again it is very important that you avoid nonsteroidal antiinflammatories (NSAIDs) in people with diabetes. Some people who have had diabetes for some time may have a problem with neuropathic pain especially in their feet. Consider using low dose amitriptyline (eg 5 mg at night) to treat this.

When to use other medications to prevent strokes and heart attacks

If your patient has type 2 diabetes, or pre-diabetes, metformin is a safe and effective option to prevent strokes and heart attacks.

If your patient has a moderate (10-19%), or a high (greater than 20%), chance of having a stroke or heart attack in the next 10 years you may decide together to use another medication, such as atorvastatin 20 mg.

Please remember that people living with HIV have a higher chance of having a stroke or heart attack (multiply their chance number by 1.5). The website currently does not work this out for you.

Most patients who have a 20% (or higher) chance of stroke or heart attack in the next 10 years, would choose to take a medication like atorvastatin. These medications are very safe. It is extremely rare to get muscle soreness, or other problems, with this dose of atorvastatin taken once a day. The toolkit will show you how much benefit that your patient would get if they took atorvastatin for 10 years.

People who have already had a stroke, heart attack or have narrowed leg arteries (peripheral vascular disease) are much more likely to have another stroke or heart attack, so they will get much more benefit from taking the following medications:

- atorvastatin 20 mg (or sometimes more) daily
- aspirin 75 mg daily after food (clopidogrel is a more expensive medication that does the same job as aspirin, with the same risk of bleeding from the stomach or gut)
- blood pressure medications if the systolic blood pressure is above 140 mm/Hg
- metformin if the patient has diabetes

People who have heart failure, or angina, will also need medication to improve their symptoms but they will also need a number of medications to help them to live well, for longer.

Patients who have a completely irregular pulse should have an ECG (an electrocardiogram) done to look for a problem called atrial fibrillation. The patient will usually be treated with a medicine called a DOAC (a Direct Oral AntiCoagulant) to prevent strokes.

Example Clinic data sheet

Date: WhatsApp number
Name: Status
Age: Gender:
Village/Lodge
Smoker: N Y
Alcohol: N <14 units/week 15-44 units/week >45 units/week
Height:
Weight:
Waist circumference:
Waist to height ratio:
Blood Pressure: 1 2 3
Diabetes symptoms?
(Urine dip: glucose blood protein ketone)
Blood glucose (if relevant):
Diagnosis:
High blood pressure >180, >160, >140
Unfit >0.6 >0.55 >0.5
Harmful alcohol - Life expectancy shortened by 4-5 years
Smoker - Life expectancy shortened by 7-13 years

Current waist circumference:
 Kuzungulira kwa m'chiuno pano:
 Ideal waist circumference (half height or less):
 Kuzungulira koyenera m'chiuno:
 Target waist circumference in 3 months:
 Kuzungulira m'chiuno chomwe mukufuna:
 Target blood pressure: 140 or less
 Kuthamanga kwa magazi: 140 kapena kuchepera
 Consider avoiding fruit juice and sugar in drinks
 Ganizirani kupewa madzi a zipatso ndi shuga mu zakumwa
 Swap to roller meal more often
 Zosanka mugaiwa m'malo mwa nsima nthawi zambiri
 To reduce your waist line faster consider the 16 and 8 eating plan
 Kuti muchepetse mzere wa m'chiuno mwanu mwachangu lingalirani
 dongosolo la 16 ndi 8
Lifestyle choice(s):
 Zosankha za Moyo:
 ★ Zakudya zochepa za sodium
 ★ *Sunthani zambiri, khalani mochepepa*
 • Khalani mochepepa
 • Kusuntha zambiri
 • Aerobics apampano
 • Zolimitsa thupi kunyumba
 ★ *Kudya zathanzi*
 • GI lotsika landondomeko (2 videos and table)
 • *Njira ya 16 ndi 8 yodyera*
 (Kusiya kubema) (Drink alcohol safely)
Medication choice(s):
 Zosankha za Mankhwala:
 • Mankhwala othamanga magazi
 • Metformin
Next due at Kakumbi clinic:
 Chotsatira ku Kakumbi clinic:

High blood pressure clinic. New patient protocol

New Patient

Record the following information in their book:

Date

Name, Age, Village

HIV status

Smoking status

Alcohol intake

Height

Weight

Waist Circumference

Waist/height ratio

If waist/height ratio is above 0.5:

- Calculate their ideal waist circumference (1/2 their height)
- and encourage them to lose 5 cm in the next 3 months (write the month and the target waist)

BP x 3

Only check urine if has Diabetes symptoms:

e.g. are they passing urine x4 or more at night?

Review Patient

Offer HIV test each year

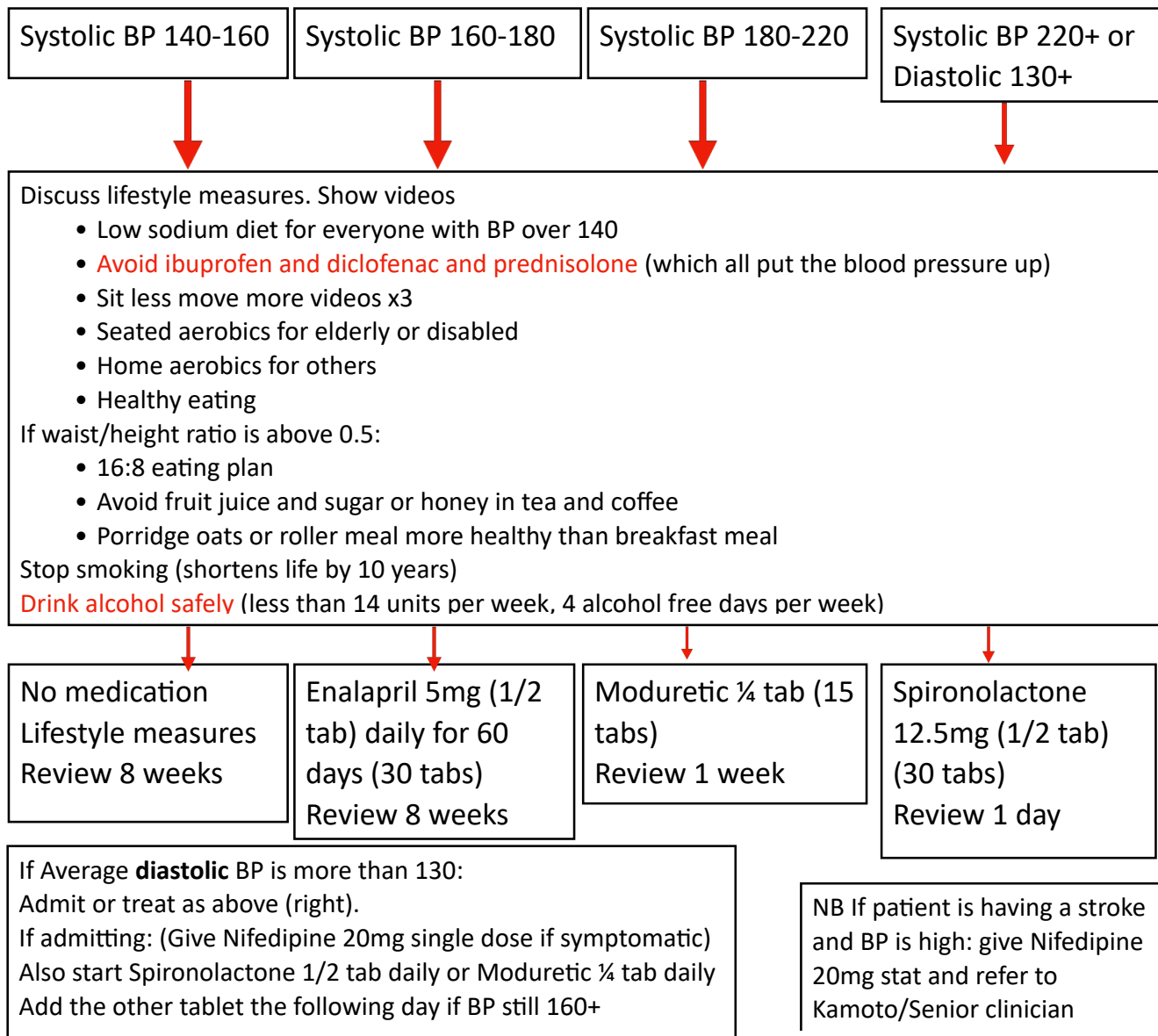
each clinic visit

BPx3

only repeat urine test for new symptoms

Systolic BP > 140 = Hypertension.

Blood pressure target is 140 or less. For frail people (eg over 75) BP target is 150 or less.



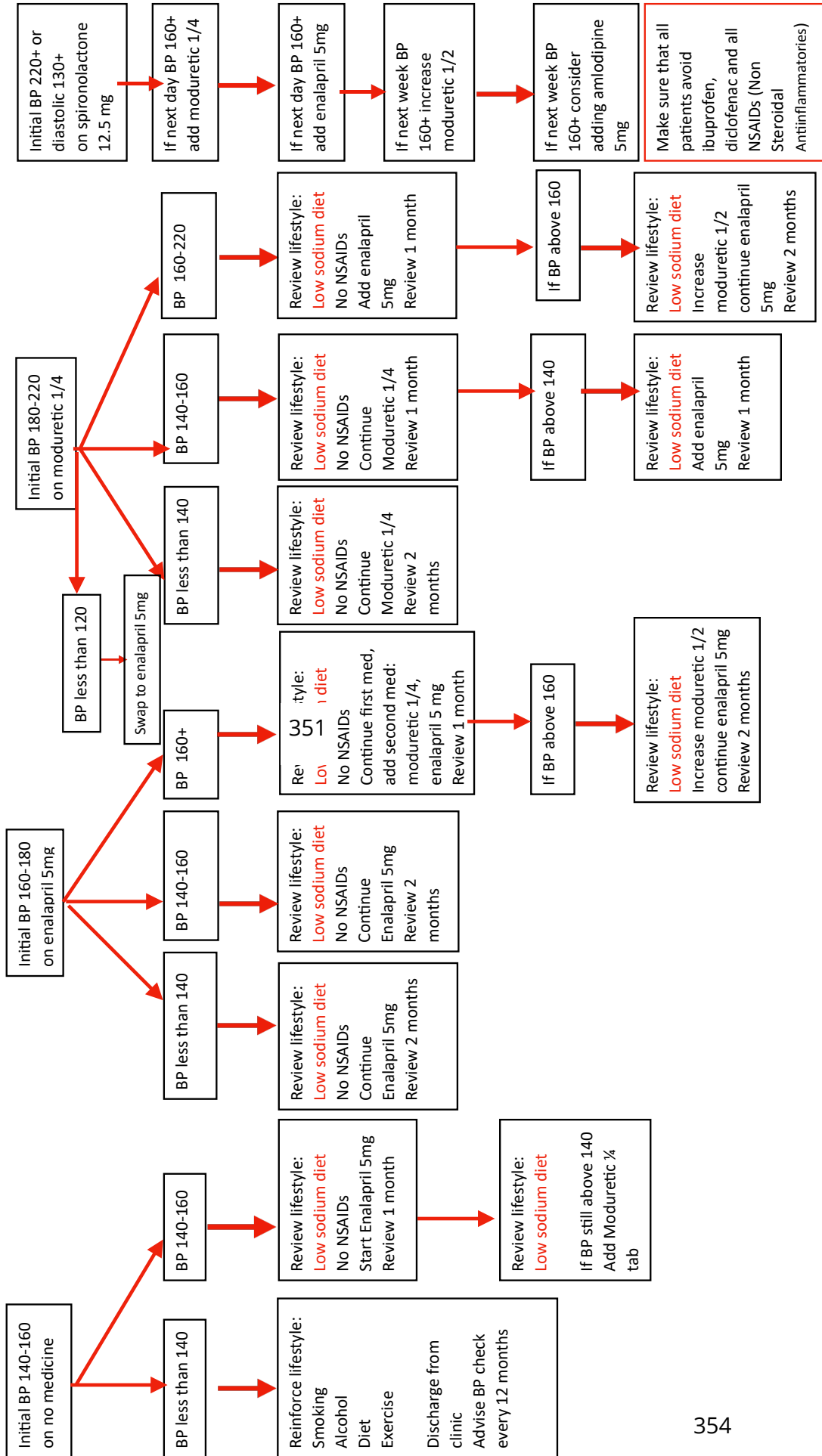
High blood pressure clinic. Follow up protocol

Follow up BP clinic

Record the following in book:

- Waist circumference
- Height/waist ratio
- BP x3

Check medications and compliance. Missed doses?



Type 2 diabetes clinic protocol (appendix 43)

New Patient

Record the following information in their book:

Date

Name, Age, Village

HIV status

Smoking status

Alcohol intake

Height

Weight

Waist Circumference

Waist/height ratio (to 2 decimal places eg 0.54)

If waist/height ratio is above 0.5:

- Calculate their ideal waist circumference (1/2 their height)
- and encourage them to lose 5 cm in the next 3 months (write the month and the target waist)

BP x 3

Check urine for all Diabetics at first appointment

Record how many times they pass urine at night

Passing urine x4 or more at night are possible osmotic symptoms, of poorly controlled diabetes

Check the evidence of what type of diabetes that they have. (Fasting glucose 7.1 or above, hba1c 6.5 (48) or above)

- Have they lost weight without trying? If they also have ketones in the urine, they may have type 1 diabetes. This would need urgent insulin. Other acute illness eg malaria or pneumonia can also cause weight loss and ketones.
- Type 2 diabetes is the most common cause of glucose in the urine. If their waist/height ratio is above 0.5, this adds evidence to this being type 2 diabetes. If a patient with type 2 diabetes loses weight healthily their diabetes will go into remission (goes away). (15% weight loss causes 86% of type 2 diabetes to go into remission.)
- Young people under the age of 30 are more likely to have Type 1 diabetes.

Review Patient

Offer HIV test each year

each clinic visit

BPx3

only repeat urine test for new symptoms

Discuss lifestyle measures. Show videos (marked with a bullet •)

- The low GI eating plan. This will improve the symptoms of people with type 2 diabetes.
 - Porridge (eg Jungle) oats are much lower GI (50) than breakfast meal (94). Roller meal is a reasonable compromise with a GI index of 71
 - Avoid fruit juice, sodas and sugar or honey in tea and coffee

• Healthy eating

If waist/height ratio is above 0.5:

- 16:8 eating plan. (Avoid if using glibenclamide (Daonil).)
 - Measure waist each clinic visit
- Stop smoking (shortens life by 10 years). Smoking massively increases stroke and heart attack risk in diabetes.
 - **Drink alcohol safely** (less than 14 units per week, 4 alcohol free days per week). Drinking alcohol unsafely (14 units or more per week) causes central obesity and type 2 diabetes.
- Sit less move more videos x3
- Seated aerobics for elderly or disabled
- Home aerobics for others
- Low sodium diet for everyone with BP over 140

Metformin for all type 2 diabetes. Increase very slowly to avoid side effects (loose stool or nausea).

Start with 1/2 a 500 mg tablet with main meal. After 1 month: 1/2 tablet with 2 main meals.

If the patient gets side effects consider dropping the dose. After 2 months the dose will usually be 500 mg, 2 times a day

Glibenclamide (Daonil). This is rarely needed in type 2 diabetes.

If a patient has osmotic symptoms of diabetes, they are usually not yet following a low GI diet, taking enough metformin, or being active. Consider whether they might have type 1 diabetes (check for ketones in the urine). Glibenclamide causes dangerously low blood sugar levels and does not protect against strokes and heart attacks.

Other medicines in diabetes

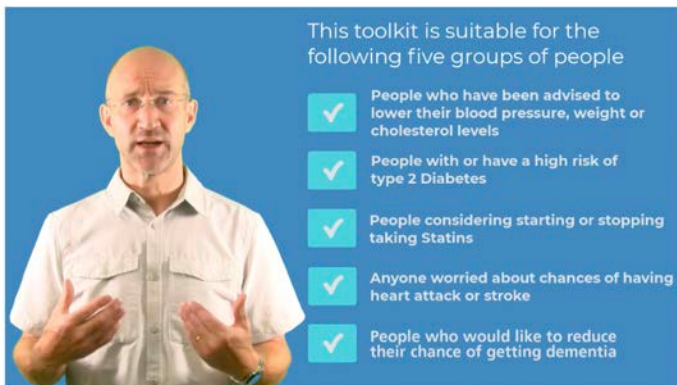
- Avoid non steroidal anti-inflammatories (diclofenac, ibuprofen) and steroids. They put the blood pressure up, cause bleeding ulcers in the stomach and damage the kidneys.
- Amitriptyline at low doses (1/4 of a 25mg tablet) can be suitable for long term pain, poor sleep or neuralgia type pain. But warn that it may make thirst worse, and that it should only be taken just before bed because it causes drowsiness.

Appendix 44.

Activity for option 2 - using the Reduce my chance of stroke website. You will need a computer or a smartphone and internet access.

This is an activity to help you to support people to use the website so that they are at the centre of their own decisions.

Please try acting out the following 2 examples of people with risk factors. These patients want your help. John and Lydia are asking for treatment and are worried about their future health. We suggest that you work with a study partner. Each of you should take turns to role play the clinician and the patient. Each pair will need either a smart phone, or a computer, and access to the internet.



He wants to know what to do about his blood day so you decide to use the average

Please put John's numbers into the toolkit: <https://alpha.patientcentre.org/calculator>

You will also need to know John's answers, measurements and test results:

Height 164 cm, weight 65 kg (waist 88 cm)

Urine dip test is negative for glucose, protein and blood. So, John does not have diabetes and kidney disease is unlikely.

His pulse is regular (he does not have atrial fibrillation).

He does not have erectile dysfunction. (This is a question asked by the toolkit because erectile dysfunction can be linked with a higher risk of stroke and heart attack.)

His numbers today are 154/98. Last month the numbers were 158/94.

None of his close family have had angina or a heart attack under the age of 60.

Total cholesterol 4.3, HDL cholesterol 1.0.

He smokes 2 cigarettes a day but he doesn't drink alcohol.

He has never been diagnosed with sleep apnoea, but he tends to nod off a lot when not in bed and he snores a lot.

His Epworth score is 6. (He falls asleep when watching TV and when he gets a chance to lie down in the afternoon.)

When he speaks to his partner, she does not think that he stops breathing when he is asleep.

He answers no to all the other questions.

His recent HIV test was negative.

This version of the toolkit does not yet tell users that living with HIV increases their chance of a future stroke or heart attack by a factor of 1.5.

Did the toolkit give you a 10 year chance of heart attack and stroke of 15% for John?

John is given key information. This is information that he may want to talk to a clinician about: He is told that there is a low chance that he may have sleep apnoea. He is also offered information about cholesterol, high blood pressure and heart attacks and strokes.

The toolkit offers John some lifestyle options. It tells John that there are 3 lifestyle options: healthy eating, moving more and stopping smoking. For John each of these options would reduce his chance of having a stroke or heart attack by 4% over 10 years. John is offered more detail about each option that would be possible for John.

The toolkit also offers John choices of medication that could reduce his chance of him having a future heart attack or stroke. Each option is described as are the possible downsides of choosing each option.

What would you do if you were John? Your job is not to tell John what to do, but to support John to make a decision that is right for John.

John decides, with your support, to not take a medication just yet. John is happier to:

- reduce his stroke chance by sitting less and moving more - he will use his phone to make sure that he will do 10,000 steps a day.
- and he plans to eat more healthily: avoiding fruit juices and sugar in drinks; preferring to eat uncooked porridge oats rather than cooked nsima (maize flour). He also plans to use a smaller plate and to avoid larger options at restaurants.
- You support John to make a decision about how to bring his blood pressure down with activity and by reducing his waist size.
- John's waist measures 88 cm. That is more than half of his height (164 cm). His ideal waist would be 82 cm. But he decides that he would like his waist to measure 84 cm, within 6 months. He knows that reducing his waist size will probably stop him from snoring and give him more energy during the day.
- John chooses to follow the 16 and 8 eating plan. This means that for many days a week he will only eat or drink during 8 hours of the day. For the other 16 hours of the day John will avoid all food. This means that he can only drink water, or have drinks with no sugar nor milk, during those 16 hours in each day. For John this means missing breakfast and having a late brunch at 11 am. He will stop eating by 7 pm on most evenings.

2 Your second patient is Lydia. She is aged 65. White African. She wants to know what to do about her blood pressure and her cholesterol numbers.

Please put Lydia's numbers into the toolkit: <https://alpha.patientcentre.org/calc/>

You will also need to know Lydia's answers, measurements and test results:

Height 166 cm, weight 90 kg (waist 105 cm)

Urine dip test is negative for glucose, protein and blood. So, Lydia does not have diabetes and kidney disease is unlikely.

Her pulse is regular (she does not have atrial fibrillation).

Her blood pressure today is 164/98. Last month the numbers were 162/94.

None of her close family have had angina or a heart attack under the age of 60.

Total cholesterol 6.3, HDL cholesterol 1.1.

She doesn't smoke but she does drink alcohol.

She has no symptoms of sleep apnoea.

She scores 0 on the Epworth sleepiness scale.

Her partner is present. He does not think that she stops breathing when she is asleep.

She answers no to all the other questions.

She is happy to have an HIV test today. The result is negative.

Did the toolkit give you a 10 year chance of heart attack and stroke of 22% for Lydia?

Lydia is given key information. This is information that she may want to talk to a clinician about: He is told that there is a very low chance that he may have sleep apnoea. Lydia is also told that she is overweight with high blood pressure. Weight loss is offered as a treatment option to help bring down her blood pressure.

The toolkit offers Lydia some lifestyle options. It tells Lydia that there are 2 lifestyle options: healthy eating and moving more. For Lydia each of these options would reduce his chance of having a stroke or heart attack by 7 or 6% respectively over 10 years. Lydia is offered more detail about each option that would be possible for Lydia.

The toolkit also offers Lydia choices of medication that could reduce his chance of him having a future heart attack or stroke. Each option is described as are the possible downsides of choosing each option.

What would you do if you were Lydia? Your job is not to tell Lydia what to do, but to support Lydia to make a decision that is right for Lydia.

- Lydia decides with your support that she wants to try a blood pressure tablet, every day in the long term. You give her a prescription of enalapril, 10 mg tablets. to take once a day, every day. You warn her of the small chance that it could cause an irritating cough, or even make her feel light-headed to start with.
- She is interested in taking a statin but statins aren't available free of charge in the clinic. She will consider taking one in future.
- She is also keen to get support in the village to become more active and to improve her eating plan.
- Lydia would like to get support to lose weight and to reduce her waist size. Her current waist is 105 cm and her height is 166 cm. Ideally her waist would be 83 cm, but she decides to get her waist down to 95 cm within 6 months.
- Lydia decides to stop drinking alcohol until her waist is down to 95 cm. She knows that alcohol contains carbohydrate and that alcohol also makes her more likely to eat unhealthy foods.
- She arranges to see the nurse again next week to have her blood pressure repeated on treatment and to talk about what she might be able to do with support from the clinic and the village lifestyle programme.

Why not put your own numbers and details into the toolkit? Or perhaps a family member's numbers and details?

The toolkit is designed to help the user to know what their choices are. Used with a clinician to support them, it will make sure that every person can come up with personal decisions. This is called shared decision making. Personal decisions made with clinician support are more effective and are more likely to last.

Please go back and take a look at the results pages for John and Lydia above. Watch the videos and read the words. This might take you 30 minutes. This will tell you a little bit more about the things that individual patients can do to reduce their blood pressure and reduce their future chance of having a stroke or heart attack. An important part of John and Lydia's results page is at the very bottom. John and Lydia are asked to write down their own thoughts, fears, questions and priorities. With that information you, their clinician, will be much more likely to help John and Lydia to choose the right options for them. You want to reduce their blood pressure, or to reduce their future chance of having a heart attack or stroke, or to feel more healthy. The patient will tell you which of these is most important.

Appendix 45 Choosing blood pressure medications in different countries

In many countries there will be a limited number of blood pressure medicines that are available regularly or that are affordable. Often patients with very high blood pressure will need to take 2 or more medicines regularly. The 3 boxes below suggests some of the medicines that could be used or taken together. Generally we recommend using low doses of medications to avoid unwanted symptoms (side-effects). Add another low dose medication from a different family of blood pressure tablets rather increase the dose of the first medication if the blood pressure is still high. Avoid nifedipine and atenolol.

If the full range of blood pressure medications are available, ask 5 questions:

1. Could this person become pregnant?
2. Does this person have diabetes?
3. Is this person Black African or African Caribbean?
4. How old is the patient?
5. Does the patient have heart failure? - choosing medication and giving the right dose requires a doctor with experience.

First choice medicine when available:

1 Whilst a woman is preparing for pregnancy, they should not usually take medications from the enalapril family (ACE inhibitors or "prils") nor from the hydrochlorothiazide or amiloride family (diuretics) (nor from the ARB family - the "sartans". Other medications are prescribed with advice from a doctor with experience in treating high blood pressure in pregnancy.

2 In diabetes the first choice treatment is from the enalapril family.

3 Africans should be given medication from the amlodipine family as a first choice when it is available.

The enalapril family used to be thought to be less effective for Black Africans or Black Caribbeans but evidence on what medication works best to prevent strokes and heart attacks in this group is poor.

4 If under 55, most non Africans should be given enalapril or similar.

5 If over 55, most people should be given amlodipine or similar unless diabetic.

Second and third medications to be added:

This can be any from 3 main families of blood pressure medications.

Enalapril / hydrochlorothiazide / amlodipine

(Using moduretic is a compromise recommendation. When used at the correct dose of 1/4 tablet daily it contains a low dose of 2 medications that both treat high blood pressure in a slightly different way. But they are both weak diuretics. Moduretic is often recommended when a patient is expected to need more than one medication for their blood pressure because of convenience and cost.)

Hydrochlorothiazide 12.5 mg once a day on its own is an option. But again it is not a good choice if the patient gets gout.

Glossary and abbreviations

- abscess:** a swelling under the skin filled with *pus*.
- abdomen:** the part of the body that contains the stomach, bowel and many other organs.
- abortion:** the unborn baby dies inside the *uterus* before the woman has been pregnant for 6 months.
- allergy:** a reaction to medicine, food or an insect bite. The reaction is often sneezing, an itchy rash, or difficult breathing. Allergies can be very dangerous.
- antibiotic:** medicine used to fight *bacteria*.
- antibodies:** the weapons that the body uses to fight *infection*.
- anus:** the hole at the end of the *bowel* where *faeces* leave the body.
- ART and ARV:** AntiRetroviral Therapy and AntiRetrovirals
- artery:** a tube which carries blood away from the heart. You can feel a *pulse* when you touch an artery.
- bacteria:** small germs which can cause infectious illness. *Antibiotics* fight bacteria.
- birth:** the time when a baby comes out of the *uterus*.
- bladder:** the bag inside the *abdomen* that stores *urine*.
- bowel:** intestine.
- cancer:** a *disease* that spreads inside the body and may cause death.
- cervix:** the neck or opening of the *uterus* inside the *vagina*.
- chest indrawing:** the skin is pulled in when the patient breathes in.
- cholera:** an illness in which the patient passes a large amount of very watery *faeces*.
- clinic:** a place where trained health workers see patients
- condom:** a narrow rubber sheath that a man wears on his penis during *sexual intercourse*. Condoms prevent sexually transmitted diseases, including HIV, and prevent pregnancy.
- consciousness:** the patient is awake, or is asleep, but can be woken.
- constipation:** pain or difficulty passing *faeces*.
- contraception:** any method of delaying or preventing pregnancy.
- convulsion:** (also called a *fit*): the patient becomes stiff and may shake. The patient cannot stop the stiffness or control the shaking.
- counselling:** to help the patient to decide what to do.
- dehydration:** the result of loss of a large amount of water and salts from the body, usually caused by diarrhoea.
- disease:** an illness or a group of illnesses. Very severe febrile disease is a group of diseases that includes several severe illnesses.
- dysentery:** diarrhoea with blood in the *faeces*.
- examine:** to look at, listen to, or feel, parts of the body to find out what is wrong.
- faeces:** stool. The waste that comes out of the end of the *bowel*.
- fallopian tubes:** the tubes through which eggs pass to reach the inside of the *uterus*.
- family planning:** to use methods to delay or to prevent pregnancy. To have the number of children that a family wants, when the family wants children.
- febrile:** to have a *fever*.
- fever:** when the body temperature is high. This may mean: that the patient or carer tells you that the patient had a fever; the patient feels hot to touch; the temperature under the arm is 37.5 °C (99.5°F) or higher, or in the *rectum* or mouth is 38°C (100.4 °F) or higher.
- fit:** see *convulsion*.
- folic acid:** folic acid or folate, is a *vitamin* found in food that the body needs to help it make red blood cells.
- foreign body:** a thing which is not part of the human body, for example a stone in the ear.

- fungus:** germs that grow like moulds and which can cause *infections*. Anti-fungal treatments fight fungus infections.
- generic:** the normal name of a medicine. Generic medicines are usually cheaper than brand name medicines.
- haemoglobin:** a red protein that contains iron. Haemoglobin carries *oxygen*.
- hookworm:** hookworm are small *parasites* which live in a person's intestine and suck blood.
- HIV:** human immunodeficiency virus
- hygiene:** clean habits which prevent *disease*. This includes preparing food in a clean way, drinking water from a protected water source, putting *faeces* in latrines or covered holes, washing regularly.
- hypoglycaemia:** low blood sugar.
- immune system:** the system that helps the body to fight *disease*. The immune system makes *antibodies* or special cells to fight disease.
- immunisation:** a medicine which will protect against a *disease*. Also called *vaccines*. Some immunisations are injected and some are drunk. There are immunisations for tuberculosis, tetanus, polio, diphtheria, COVID 19, measles, mumps and rubella. Other immunisations may be available in some countries.
- infection:** an illness caused by *bacteria*, *viruses* or other very small living things.
- intramuscular (IM) injection:** an injection put into a muscle, usually into the upper leg.
- intravenous (IV) injection:** an injection put into a vein.
- jaundice:** a yellow colour in the white part of the eyes and the skin.
- joints:** places where bones meet.
- Kernig's sign:** a pain felt in the back, neck or head when the patient's hip is bent and the knee straightened. It is used to diagnose *meningitis*.
- kg** kilogram
- kidneys:** two organs that are behind the *abdomen* which make *urine* by cleaning waste from the blood.
- loss of consciousness:** see *unconscious*.
- lymph nodes:** small lumps under the skin which trap and fight *infections*. Lymph nodes become swollen and often painful if they become infected.
- mastoid:** the part of the skull bone behind the ear.
- measles complications:** problems or *infections* that occur during or after measles. Diarrhoea, pneumonia and skin infections are examples of measles complications.
- meningitis:** meningitis is an infection of the outside of the brain. Meningitis is caused either by *bacteria* or *viruses*.
- menstrual period:** bloody fluid which leaves a woman's *uterus*, passes through the *vagina* and out of the vagina. This happens about every 28 days and lasts for a few days.
- microscope:** an instrument that makes very small things look larger.
- minerals:** simple substances in foods that help to build the body and help the body fight *disease*. Iron is an example of a mineral.
- mg** milligram
- mmHg** millimetres of mercury. The units for measuring blood pressure.
- nausea:** the patient feels as if they may vomit.
- nipple:** the middle of the round, dark part of the breast. In women, this is where milk for the baby comes out.
- NSAID:** non steroidal anti-inflammatory drug
- nutrition:** the food that people eat. Good nutrition is important: it means eating a mixed diet to help the body to grow and fight disease.

- oral rehydration solution:** a solution made with oral rehydration salts (ORS), a mixture of glucose and salts: sodium chloride 3.5 g/l; trisodium citrate 2.9 g/l, potassium chloride 1.5 g/l; and glucose 20.0 g/l.
- oxygen:** a gas in air that the body needs to live.
- parasite:** very small worms and creatures that can live inside people and cause *disease*, for example malaria and schistosomiasis.
- PCP:** Pneumocystis Jirovecii Pneumonia (formerly Pneumocystis Carinii Pneumonia)
- period:** a shortened way of referring to *menstrual period*.
- Placebo:** a medicine or treatment that has benefit because the patient believes it will work.
- prescriber:** a trained health worker who decides what medicines to give to patients.
- private parts:** the parts of the bodies of men and women which allow people to have *sexual intercourse* to produce babies. These parts include the woman's *vagina* and the man's penis.
- pulse:** the movement of an artery each time the heart beats. The pulse rate tells you how many times the heart beats in one minute.
- pus:** yellow or green fluid in wounds or *abscesses* caused by the body fighting *infection*.
- rectum:** the lower part of the *bowel*. *Faeces* are stored in the rectum.
- refer:** to send a patient to be seen by another health worker.
- respiratory distress:** a patient with respiratory distress finds it very difficult to breathe.
- schistosomiasis:** a *parasite* that enters the body through the skin.
- scrotum:** the bag between a man's legs that holds his testes (testicles).
- sexual intercourse:** sex with the penis in the *vagina*.
- shock:** a dangerous problem which results in not enough blood reaching the brain and other parts of the body.
- sign:** something that you see, hear or feel which helps you decide which *disease* the patient has, for example fast breathing or *chest indrawing*.
- SpO₂:** *arterial blood oxygen saturation measured by pulse oximetry*
- sterilise:** to kill *bacteria*, *viruses* and *fungus* on a piece of equipment, usually by steaming or boiling it for 20 minutes. At high altitudes, the steaming or boiling time must be much longer.
- stethoscope:** an instrument used to listen to sounds inside the body.
- subcutaneous injection:** an injection given under the skin.
- symptom:** something the patient tells you about, or which you can see, which helps you to decide which *disease* the patient has.
- syringe:** an instrument used to inject medicine.
- temperature:** see *fever*.
- TB:** *tuberculosis*
- tab:** *tablet*
- tutorial:** a lesson between a trainer and one student or a few students.
- ulcer:** a painful open sore.
- unconscious:** a state in which an ill or injured patient seems to be asleep but cannot be awakened.
- ureter:** tubes in the *abdomen* which carry *urine* from the *kidneys* to the *bladder*.
- urine:** fluid waste that collects in the *bladder*.
- uterus:** also called the womb. Where the baby grows inside a pregnant woman.
- vaccinations or vaccines:** an injection or medicine to drink which will protect against a *disease*.
- vagina:** a tube of muscle from the entrance of the *uterus* (called *cervix*) to the opening between a woman's legs. This is where a baby passes when it is born.
- vein:** a tube which carries blood towards the heart. There is no *pulse* when you touch a vein.
- virus:** a very tiny germ that causes *infections*. *Antibiotics* do not fight viruses.

Glossary

vitamins: parts of food that help to build the body and help the body to fight *disease*. Vitamin C, vitamin A and folic acid are examples of vitamins.

List of useful resources for health workers

Common skin diseases in Africa to your students. It is free to access and download at: https://plan-g.at/images/pdf/Common_skin_diseases_in_Africa_ver2017.pdf

dftbskindeep.com Skindeep - range of skin pictures of children of all colours.

MSF Essential drugs:

<https://medicalguidelines.msf.org/en/viewport/EssDr/english/essential-drugs-16682376.html>

MSF Medical Guidelines:

<https://medicalguidelines.msf.org/en/viewport/CG/english/clinical-guidelines-16686604.html>

mhGAP Intervention Guide (mhGAP-IG) for mental, neurological and substance use (MNS) disorders in non-specialist health settings. It is for use by doctors, nurses, other health workers as well as health planners and managers:

<https://www.who.int/publications/i/item/9789241549790>

Zambian National formulary:

https://www.moh.gov.zm/?wpfb_dl=37

Zambian Standard treatment guidelines:

https://www.moh.gov.zm/?wpfb_dl=32

British National Formulary 14 December 2022. Key information on the selection, prescribing, dispensing and administration of medicines:

<https://bnf.nice.org.uk>

Oxford Handbook of Tropical Medicine 5th Edition October 2021

patientcentre.org (alpha.patientcentre.org/calc/)

Reduce my chance of heart attack and stroke

Parasitic diseases 7th Edition. Despoismier, Griffin, Gwadt, Hotez, Knirsch. Parasites without borders Inc. NY

Medical Handbook for Limited Resource settings V2 Daniel O. Griffin & Sofia Maddalena Preatoni

Crofton's Clinical Tuberculosis, 3rd edition. Macmillan 2009.

Natural Medicine in the Tropics. Dr Hans Martin-Hirt and Bindanda M'Pia, 1995. Available from Arramed. Schafweide 77, D-71364 Winnenden, Germany.

Unaumwa na nini? Mafunzo ya afya ya msingi. (What is your problem? Lessons in primary health care.) Keith Birrell and Ginny Birrell, Ministry of Health, Zanzibar, Tanzania 1996.

Helping Health Workers Learn. A book of methods, aids and ideas [or instructors at the village level. David Werner and Bill Bower. The Hesperian Foundation 1982. Reprinted 2005

Every year, over 50 million people die worldwide, the majority of them in developing countries. Many of these deaths could be avoided by accurate diagnosis and correct treatment at primary health care centres.

Diagnosis and Treatment – A training manual for primary health care workers is for all health workers who see patients in a primary care setting.

This practical training manual teaches how to

- diagnose and treat the most common illnesses that present at rural and urban health centres
- prescribe rationally in line with WHO and national essential drugs guidelines
- deliver good patient care with scarce resources.

The manual contains lesson plans based on a successful training course developed by VSO doctors, national doctors and health workers and incorporates information from over 30 health experts and practitioners worldwide. It can also be used as a self-study guide and as a reference manual.

Dr Keith Birrell and Dr Ginny Birrell are qualified medical practitioners who worked overseas with VSO to develop primary health care by training health workers in diagnosis, treatment and rational prescribing.

Based on extensive field experience and field testing, this manual will help primary health care workers use essential drugs to effectively combat the ill health that continues to hinder human well-being and development in the world's poorest countries.

Dr Jonathan D Quick, Director, Essential Drugs and Other Medicines, WHO

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